MINIMIZING DISEASES OF PEANUT
IN THE SOUTHEASTERN UNITED STATES

The 2018 Version of the Peanut Disease Risk Index

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In 2017, losses to tomato spotted wilt across the peanut production region of the southeastern United States decreased slightly from estimated losses from 2016. Losses associated with spotted wilt were approximately 3.5% in 2016 and 3% in 2017, though tomato spotted wilt was more severe in some fields than in others. Growers can successfully manage this disease, and other important diseases, using Peanut Rx. This disease risk index can help growers better understand how careful selection of production practices can reduce the risk to disease losses.

The Spotted Wilt Index and the Peanut Fungal Disease Risk Index were successfully combined in 2005 to produce the Peanut Disease Risk Index for peanut producers in the southeastern United States. The Peanut Disease Risk Index, developed by researchers and Extension specialists at the University of Georgia, the University of Florida, and Auburn University, is officially known as “PEANUT Rx”. It allows growers to

assess their risk to tomato spotted wilt, leaf spot diseases and white mold. It also notes which varieties have some resistance (or increased susceptibility) to the peanut root-knot nematode (*Meloidogyne arenaria*), Cylindrocladium black rot (CBR) and Rhizoctonia limb rot. The 2018 version of PEANUT Rx has been fully reviewed and updated by the authors based upon data and observations from the 2017 field season.

Updates to the 2018 Peanut Rx

There have been a few updates to PEANUT Rx 2018 from the 2017 version. All of the changes that have been made can be found in the cultivar/variety section of Peanut Rx.

With additional data, risk points for "leaf spot" assigned to varieties 'Bailey' and 'Sullivan' been increased to "25". Three new varieties have been added to the 2018 version of Peanut Rx; all have "hi oleic" chemistries. These varieties include runner-types 'TifNV-HiOl', 'Georgia-16HO', and FloRun™ '331'.

Because seed for this variety is no longer commercially available, variety FloRun™ '157' have been removed from the index for 2018.

As in the previous versions of the Disease Index, growers will note that attention to variety selection, planting date, plant population, good crop rotation, tillage, and other factors, has a tremendous impact on the potential for diseases in a field.

Spotted Wilt of Peanut

When tomato spotted wilt virus (TSWV) infects a host plant, it can cause a disease that severely weakens or kills that plant. This particular virus is capable of infecting a large number of plant species to include several that are important crops in the southeastern United States. Peanut, tobacco, tomato and pepper crops have been seriously damaged by TSWV. The only known method of TSWV transmission is via certain species of thrips that have previously acquired the virus by feeding on infected plants. The factors leading to the rapid spread of this disease in the Southeast are very complicated and no single treatment or cultural practice has been found to be a consistently effective control measure. However, research continues to identify factors that influence the severity of TSWV in individual peanut fields.

Peanuts and fungal diseases: an unavoidable union

Successful peanut production in the southeastern United States requires that growers use a variety of tactics and strategies to minimize losses to disease. Weather patterns in Georgia and neighboring areas during the growing season, including high temperatures, high humidity and the potential for daily rainfall and thunder storms, create nearly perfect environmental conditions for outbreaks of fungal diseases. Common fungal diseases include early and late leaf spot, rust, Rhizoctonia limb rot, southern stem rot (referred to locally as "white mold"), Cylindrocladium black rot and a host of other diseases that are common, but of sporadic importance. If peanut growers do not take appropriate measures to manage fungal diseases, crop loss in a field may exceed 50%.

Strategies for managing fungal diseases of peanut are typically dependent on the use of multiple fungicide applications during the growing season. Fungicide applications are initiated approximately 30 days after planting, as the interaction between the growth of the crop and environmental conditions are likely to support the development of leaf spot diseases. The length of the effective protective interval of the previous fungicide application determines the timing for subsequent applications. The length of time in which a fungicide can protect the peanut plant from infection is dependent on the properties of the fungicide and on weather conditions. Many growers will begin treating for soilborne diseases approximately 60 days after planting. With attention to proper timing of applications and complete coverage of the peanut canopy, growers can expect good to excellent control of leaf spot and reasonable control of soilborne diseases. Although control of leaf spot may approach 100%, growers typically can only expect about 60-70% control of soilborne diseases with effective fungicide programs.

Weather plays a major role in the potential for disease. Most fungal diseases will be more severe during periods of increased rainfall and of less concern during drier periods. **When weather conditions are very favorable for disease, severe epidemics may occur in fields where disease was not thought to be a problem. When weather conditions are unfavorable for fungal growth, disease severity may be low even in fields where it has been common in the past.** The AU-pnut leaf spot advisory that has been used to effectively manage diseases in peanut is based on this relationship between disease and weather. Even those growers who do not use AU-pnut recognize the need to shorten the time between fungicide applications during wet weather.

Factors Affecting the Severity of TSWV on Peanut

Peanut Variety

No variety of peanut is immune to TSWV. However, some varieties have consistently demonstrated moderate levels of resistance. In addition to resistance, (reduced disease incidence), some varieties appear to have some degree of tolerance (reduced severity in infected plants) as well. Higher levels of resistance and tolerance are anticipated since peanut breeding programs are now evaluating potential new varieties for response to TSWV.

Peanut varieties can have a major impact on fungal diseases as well as TSWV incidence. The variety ‘Georgia-06G’ is currently planted on much of the peanut acreage in the Southeast and it has a significant level of resistance to tomato spotted wilt. However, newer varieties may have improved resistance. For example, the variety ‘Georgia-12Y’ has resistance to tomato spotted wilt and to white mold that is better than that found in Georgia-06G. Just as none of the current varieties is immune to spotted wilt, none is completely immune to fungal disease either. However, improved resistance will likely lead to a reduction in disease severity. It is important to remember that improved resistance to one disease does not mean that the variety also possesses superior resistance to other diseases.

Planting Date
Thrips populations and peanut susceptibility to infection are at their highest in the early spring. The timing of peanut emergence in relation to rapidly changing thrips populations can make a big difference in the incidence of TSWV for the remainder of the season. Optimum planting dates vary from year to year, but in general, early-planted and late-planted peanuts tend to have higher levels of TSWV than peanuts planted in the middle of the planting season. Note: In recent years, peanut planted in the second half of May and in June have been less affected by spotted wilt than in previous years.

It is important for larger acreage peanut farmers to spread their harvest season. Some staggering of planting dates may be necessary, but to avoid spotted wilt pressure, it may be more effective to plant varieties with different time-to-maturity requirements as closely as possible within a low-risk time period. If peanuts must be planted during a high-risk period, try to minimize the risk associated with other index factors.

Planting date can affect the severity of fungal diseases in a field. Earlier planted peanuts (April-early May) tend to have more severe outbreaks of white mold than do later planted peanuts. Earlier planted peanuts are likely to be exposed to longer periods of hot weather, favorable for white mold, than later planted peanuts which will continue to mature into late summer or early fall. However, the threat from leaf spot increases as planting date is moves from April to early May to later May and June. Reasons for this include the warmer temperatures later in the season that are more favorable for the growth and spread of the leaf spot pathogens and because the level of inoculum (number of spores) in the environment increases as the season progresses. Thus, later planted peanuts spend a greater portion of their growth exposed to increased leaf spot pressure than do earlier plantings.

NOTE: Because of the reduction of tomato spotted wilt in recent years, the increased resistance in new varieties, and the need for timely harvest of the peanut crop, growers may consider planting a portion of their crop in April, assuming the risk to tomato spitted wilt is appropriately managed. Growers who plant the MORE RESISTANT peanut varieties in the latter part of April should not be at a significant risk to losses from tomato spotted wilt in the 2017 season.

Plant Population
An association between “skippy” stands and higher levels of TSWV was noted soon after the disease began to impact peanut production in Georgia. More recently, research has confirmed the impact of plant population on TSWV incidence. Low and high plant populations may actually have the same number of infected plants, but the percentage of infected plants is greater in low plant populations. In other words, a higher plant population may not reduce the number of infected plants, but it will increase the number of healthy plants that can fill in and compensate for infected plants. In some cases, low plant populations may result in increased numbers of thrips per plant thereby increasing the probability of infection. When plant populations are as low as two plants

per foot, severe losses to TSWV have been observed even when other factors would indicate a low level of risk. Getting a rapid, uniform stand with the desired plant population is a function of not only seeding rate but also seed quality, soil moisture, soil temperature and planting depth.

NOTE: In the 2018 version of Peanut Rx, peanut varieties with a risk of TSWV at 25 points or less have a reduced risk (10 points) when planted at 3-4 seeds per foot than do varieties with a risk of 30 points or greater (15 points). This is based upon recent research conducted at the University of Georgia by Dr. Scott Tubbs.

Plant population has less effect on fungal diseases than on spotted wilt. However, it is now known that the severity of white mold increases when the space between the crowns of individual plants decreases. This is because the shorter spacing allows for greater spread of the white mold fungus, *Sclerotium rolfsii*.

Insecticide Usage

In general, the use of insecticides to control thrips, the insect that transmits or "vectors" the tomato spotted wilt virus, has been an ineffective means of suppressing tomato spotted wilt disease. In theory, lowering overall thrips populations with insecticides should effectively reduce in-field spread of TSWV and growers now have a selection of products that are effective in killing thrips. However, most insecticides have proven to be ineffective at suppressing primary infection, which accounts for most virus transmission in peanut fields. Despite the overall disappointing results with insecticides, one particular chemical - phorate (Thimet 20G), has demonstrated consistent, low-level suppression of TSWV. The mechanism of phorate's TSWV suppression is not known, but the level of thrips control obtained with phorate is <u>not</u> greater than that obtained with other insecticides. Phorate may induce a defense response in the peanut plant that allows the plant to better resist infection or inhibits virus replication**. IMPORTANT NOTE:** In Peanut Rx, use of Thimet 20G, but not other insecticides, reduces risk of tomato spotted wilt. However this does not mean that other products offer good-to-excellent control of thrips which is also an important production consideration.

Row Pattern

Seven to ten-inch twin row spacing, utilizing the same seeding rate per acre as single row spacing, has become increasingly popular in Georgia. Research on irrigated peanuts has shown a strong tendency for significantly higher yields, a one to two point increase in grade and reductions in spotted wilt severity that have averaged 25-30%. The reason for this reduction in spotted wilt is not fully understood.

Row pattern, either single or twin row plantings, also has some effect on the potential for disease in a field. Work done at the Coastal Plain Experiment Station has lead to the observation that white mold is more severe in single rows (six seed per foot) than in twin rows (three seed per foot). White mold often develops in a field by infecting sequential plants within the same row. Planting the seed in twin rows rather than single rows increases the distance between the crowns of the peanut plants and delays the spread of white mold from plant to plant. The difference in leaf spot between single and twin row peanuts appears to be negligible.

Tillage

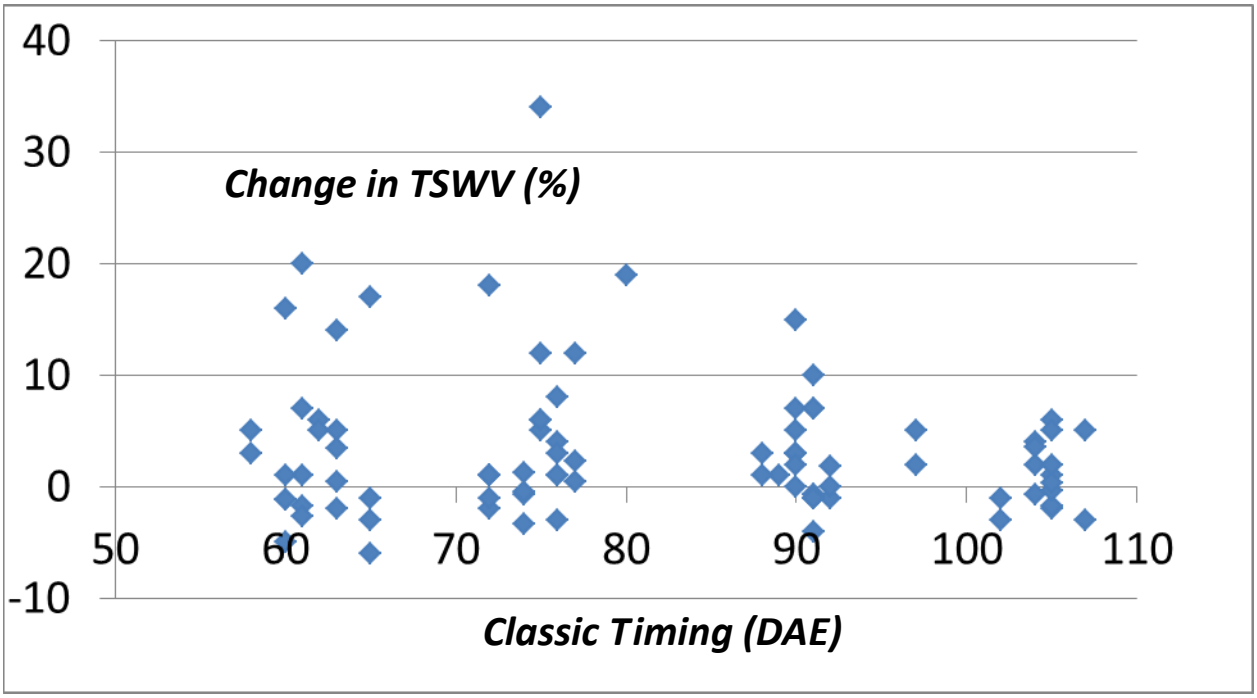
The tillage method that a grower utilizes can make a big difference in peanut yields. There are many different methods to choose from, each with its own merits and disadvantages for a given situation. Strip tillage has been shown to have some strong advantages (including reduced soil erosion and reduced time and labor required for planting), but in some situations, yields have been disappointing. Unbiased tillage research is difficult to accomplish, but studies have consistently shown that peanuts grown in strip till systems have less thrips damage and slightly less spotted wilt. On-farm observations have corroborated these results, but more studies are needed in order to characterize the magnitude of the reduction. We do not suggest that growers should change their tillage method just to reduce spotted wilt, but we have included tillage in the risk index in an attempt to better identify total risks.

Conservation tillage, such as strip tillage, can reduce the amount of disease in a peanut field. For a number of years it has been recognized that spotted wilt is less severe in strip-tilled fields than in fields with conventional tillage. However, in results from recent field trials, it has been documented that leaf spot is also less severe in strip-tilled fields than in conventionally tilled fields, so long as peanut is not planted in consecutive season. Although the exact mechanism is currently unknown, the appearance of leaf spot is delayed in strip-tilled fields and the severity at the end of the season is significantly lower than in conventional tillage. Use of conservation tillage does not eliminate the need for fungicides to control leaf spot, but helps to insure added disease control from a fungicide program. Additional studies have found that white mold may be slightly more sever in strip tillage above conventional tillage; deep turning the soil may help to reduce the treat to white mold by burying initial inoculum (sclerotia). Rhizoctonia limb rot was not evaluated; however cotton is a host for *Rhizoctonia solani* and the cotton debris would likely serve as a bridge between crops. Disease management is only one of many factors that a grower must consider when choosing to practice either conventional or conservation tillage. However, if a grower decides to practice conservation tillage with peanut production, he can expect lower levels of leaf spot in many instances.

Classic® Herbicide

Research and field observations over the past several years have confirmed that the use of Classic (chlorimuron) can occasionally result in an increased expression of tomato spotted wilt of peanut. Results from 23 field trials conducted from 2000 to 2012 are presented in the following graph:

Classic Effects on TSWV in Peanut (2000-2013)



Since 2000, the effect of Classic Herbicide on tomato spotted wilt in peanut has been assessed in 27 field trials resulting in 90 data points. Classic caused an 8% or less increase in tomato spotted wilt about 88% of the time and an increase of more than 8% about 12% of the time. Consequently, these results indicate that the effects of Classic on TSWV are minimal in comparison to the other production practices that influence this disease. Consequently, late-season Florida beggarweed populations that have the potential to reduce harvest efficiency and fungicide spray deposition should be treated with Classic. To date, other peanut herbicides have not been shown to have an influence on spotted wilt.

NOTE: Although not related to tomato spotted wilt or any other disease, the University of Georgia now recommends that Classic herbicide **not** be applied to the Georgia-06G variety. Research conducted by Dr. Eric Prostko has determined that use of Classic herbicide is associated with a reduction in yield with this single variety.

Crop Rotation

Crop rotation is one of the most important tactics to reduce disease severity in peanut production, or any other cropping situation for that matter. Increasing the number of seasons between consecutive peanut crops in the same field has been shown to reduce disease levels and increase yield. The fungal pathogens that cause leaf spot, Rhizoctonia limb rot, and white mold survive between peanut crops on peanut crop debris, as survival structures in the soil, and on volunteer peanuts. The time that passes between consecutive peanut crops allows for the degradation of the peanut crop debris, thus depriving the fungal pathogens of a source of nutrition. Also, fungal

survival structures and spores that are present in the soil have a finite period of viability in which to germinate and infect another peanut plant before they are no longer viable. Fields with longer crop rotations will have less pressure from leaf spot diseases, Rhizoctonia limb rot, white mold, and perhaps CBR, than fields with shorter rotations, or no rotation at all. In Georgia, the Cooperative Extension recommends at least two years between peanut crops to help manage diseases.

Choice of rotation crops, along with the length of the rotation, will have an impact on the potential for disease in a field. Rotation of peanut with ANY other crop will reduce the potential for early leaf spot, late leaf spot, and peanut rust. The pathogens that cause these diseases do not affect other crops. Rotation of peanuts with cotton, or a grass crop such as corn, sorghum, or bahiagrass, will reduce the potential for white mold because the white mold pathogen does not infect these crops, or at least not very well. Rotation of peanut with a grass crop will reduce the risk of Rhizoctonia limb rot. However, because cotton is also infected by *Rhizoctonia solani*, rotation with this crop will not help to reduce Rhizoctonia limb rot. Other crops, such as tobacco and many vegetables are quite susceptible to diseases caused by *Rhizoctonia solani* and will not help to reduce the severity of limb rot in a peanut field.

Growers must remember that soybeans and peanuts are affected by many of the same diseases. Planting soybeans in rotation with peanuts will not reduce the risk for CBR or peanut root-knot nematodes and will have only limited impact of risk to white mold and Rhizoctonia limb rot.

Field History

The history of disease in a field can be an important hint at the possibility of disease in the future, for much the same reason as noted in the crop rotation section above. Fields where growers have had difficulty managing disease in the past, despite the implementation of a good fungicide program, are more likely to have disease problems in the future than are fields with less histories of disease.

There is some difference between white mold and Rhizoctonia limb rot with regards to field history. Where white mold has been a problem in the past, it can be expected to be again in the future. Without effective crop rotation, outbreaks of white mold can be expected to become increasingly severe each season. Rhizoctonia limb rot is a disease that is more sensitive to environmental conditions, especially rainfall and irrigation, than white mold. Therefore, the severity of Rhizoctonia limb rot is likely to be more variable than white mold from year to year based upon the abundance of moisture during the season.

Irrigation

Irrigation is a critical component of a production system and can result in large peanut yields. However, the water applied to a crop with irrigation is also beneficial for the fungal pathogens that cause common diseases such as leaf spot, Rhizoctonia limb rot, and white mold. Rhizoctonia limb rot is likely to be more severe in irrigated fields with

heavy vine growth; the increase in white mold may be less obvious. High soil temperatures as well as moisture from irrigation affect the severity of white mold.

Fungi causing leaf spot diseases need water for several important reasons, including growth, spore germination and infection of the peanut plant, and in some cases, spread of the fungal spores. Use of irrigation may extend the period of leaf wetness and the time of conditions favorable for leaf spot diseases beyond favorable conditions in a non-irrigated field. In two otherwise similar fields, the potential for disease is greater in the irrigated field.

Special note on irrigation and risk to white mold: From the discussion above, irrigation (and ample rainfall) can create conditions that favor outbreaks of white mold-to include more abundant moisture for growth and also greater humidity within a canopy which favors growth and spread of white mold. However, rainfall and, especially, irrigation are essential in the movement of foliar-applied fungicides from the leaves to the limbs and the crown of the plant where protection is needed from white mold.

Under non-irrigated conditions, growers may actually observe MORE white mold than for irrigated peanuts, largely because effective fungicides are not "washed" to the parts of the plant that must be protected from this disease.

Growers can use several strategies to improve efficacy of fungicides for management of white mold in non-irrigated fields.

1. Apply fungicides for control of soilborne diseases ahead of anticipated rain events to facilitate movement of fungicides.
2. Apply fungicides for control of soilborne diseases at night when the leaves are folded; such timing of application will increase coverage of the limbs and crowns of the plants.

Reducing Risk to Losses from Peanut Root-knot Nematodes

Peanut root-knot nematode is not specifically included in Peanut Rx; however several of the factors that affect risk to other diseases also affect risk to losses from nematodes. These factors include the following.

1. Variety selection: Varieties 'Tifguard', 'Georgia-14N' and 'TifNV-HiOL' are highly resistant to infestation from the peanut root-knot nematode (*Meloidogyne arenaria*). Growers who plant these varieties in a root-knot nematode infested field will not need to use a nematicide. Use of nematode-resistant varieties not only protects the crop in the field, but also reduces nematode populations for the next peanut crop as compared if a susceptible variety like 'Georgia-06G' was planted.
2. Crop rotation: Like risk to other diseases, the threat from peanut root-knot nematode is greatly reduced by rotating fields away from peanut and other susceptible crops like soybeans. Cotton and corn are excellent rotation crops to reduce the risk of peanut root-knot nematodes in a field. Corn is also a host for

the peanut root-knot nematode, but is a better rotation crop than either peanut or soybeans.

3. Tillage: Though much research is still needed, there is some indication that there is higher risk to nematodes in fields are prepared with reduced tillage than with conventional tillage. This effect is much less important than variety selection or crop rotation, and is not always observed. However, there is some evidence that disrupting the soil, such as occurs in conventional tillage, could help to disperse nematode populations present in the root zone of the developing seedling.
4. UGA Extension recommends that with high populations of root-knot nematodes growers are strongly recommended to plant nematode resistant varieties, and these varieties do not require the use of a nematicide. However, with low-to-moderate populations, growers could also consider using Velum Total or Telone II, and still plant susceptible cultivars such as GA-06G.

Measuring TSWV Risk

Many factors combine to influence the risk of losses to TSWV in a peanut crop. Some factors are more important than others, but no single factor can be used as a reliable TSWV control measure. However, research data and on-farm observations indicate that when combinations of several factors are considered, an individual field's risk of losses due to TSWV can be estimated. There is no way to predict with total accuracy how much TSWV will occur in a given situation or how the disease will affect yield, but by identifying high risk situations, growers can avoid those production practices that are conducive to major yield losses. The University of Georgia Tomato Spotted Wilt Risk Index for Peanuts was developed as a tool for evaluation of risk associated with individual peanut production situations. When high-risk situations are identified, growers should consider making modifications to their production plan (i.e. variety, planting date, seeding rate, etc.) to reduce their level of risk. **Using preventative measures to reduce risk of TSWV losses is the only way to control the disease. After the crop is planted, there are no known control measures.**

The index combines what is known about individual risk factors into a comprehensive, but simple, estimate of TSWV risk for a given field. It assigns a relative importance to each factor so that an overall level of risk can be estimated. The first version of the index was developed in 1996 and was based on available research data. Small plot studies and on-farm observations have been used to evaluate index performance each year since release of the first version. In research plots where multiple TSWV management practices were used, as little as 5% of the total row feet were severely affected by TSWV compared to over 60% in high-risk situations. Yield differences were over 2000 lbs. per acre in some cases. Results of these and other validation studies have been used to make modifications in all subsequent versions of the index. Future changes are expected as we learn more about TSWV.

Keep in mind that the risk levels assigned by this index are relative. In other words, if this index predicts a low level of risk, we would expect that field to be <u>less likely</u> to suffer major losses due to TSWV than a field that is rated with a higher level of risk. A low index value does <u>not</u> imply that a field is immune from TSWV losses. Losses due to

TSWV vary from year to year. In a year where incidence is high statewide, even fields with a low risk level may experience significant losses.

Measuring Risk to Fungal Diseases of Peanut

The index presented here is based upon better understanding of factors that affect disease incidence and severity. It is designed to help growers approximate the magnitude of the risk that they face from foliar and soilborne diseases in the coming season. More importantly, it should serve as an educational tool that allows the grower to predict the benefits of different management practices to produce a better crop.

The risks associated with leaf spot, white mold and Rhizoctonia limb rot diseases are to be determined independently in the index system to be presented here. The magnitude of points associated with each variable is not linked between soilborne and foliar disease categories. However, the points allotted to each variable in the PEANUT Rx are weighted within a disease category according to the importance of the variable (such as variety or field history) to another variable (such as planting date). For example, within the category for leaf spot diseases, a maximum of 30 points is allotted to the variable “variety” while 0 points is allotted to the variable “row pattern”. The magnitude of points assigned within each category and to each variable has been checked to ensure that the total number of points assigned to a field is consistent with research and experience. For example, while it would be possible for a non-irrigated field planted to Georgia Green to fall in the lowest risk category, a field of irrigated Georgia Green could be in a category of “medium risk” but not “low risk”.

NOTE: When weather conditions are favorable for fungal diseases, especially when rainfall is abundant, even fields at initial “low risk” to fungal diseases may become “high risk”.

PEANUT Rx

For each of the following factors that can influence the incidence of tomato spotted wilt or fungal diseases, the grower or consultant should identify which option best describes the situation for an individual peanut field. An option must be selected for each risk factor unless the information is reported as “unknown”. A score of “0” for any variable does not imply “no risk”, but that this practice does not increase the risk of disease as compared to the alternative. Add the index numbers associated with each choice to obtain an overall risk index value. Compare that number to the risk scale provided and identify the projected level of risk.

Peanut Variety

Variety[1]	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points
			White mold
Bailey[3]	10	25	10
Florida-07[2]	10	20	15
Florida Fancy[2]	25	20	20
FloRun™ '107'[2]	20	25	20
FloRun™ '331'[1,2]	15	20	15
Georgia-06G	10	20	20
Georgia-07W	10	20	15
Georgia-09B[2]	20	25	25
Georgia-12Y[5]	5	15	10
Georgia-13M[1,2]	10	30	25
Georgia-14N[1,2,4]	10	15	15
Georgia-16HO[1,2]	15	25	20
Georgia Green	30	20	25
Sullivan[1,2]	10	25	15
Tifguard[4]	10	15	15
TifNV-HiOL[1,2,4]	10	15	15
TUFRunner™ '297'[1,2]	10	25	20
TUFRunner™ '511'[2]	20	30	15

[1]*Adequate research data is not available for all varieties with regards to all diseases. Additional varieties will be included as data to support the assignment of an index value are available.*
[2]*High oleic variety.*
[3]*Variety Bailey have increased resistance to Cylindrocladium black rot (CBR) than do other varieties commonly planted in Georgia.*
[4]*Tifguard, TifNV-HiOL and Georgia 14-N have excellent resistance to the peanut root-knot nematode.*
[5]*Georgia-12Y appears to have increased risk to Rhizoctonia limb rot and precautions should be taken to protect against this disease.*

Planting Date

Peanuts are planted:	Spotted Wilt Points[1]	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
Prior to May 1	30	0	10	0
May 1 to May 10	15	5	5	0
May 11-May 25	5	10	0	0
May 26-June 10	10	15	0	5
After June 10	15	15	0	5

Plant Population (final stand, not seeding rate)

Plant stand:	Spotted Wilt Points[1]	Leaf Spot Points	Soilborne Disease Points	
			White mold[2]	Limb rot
Less than 3 plants/ft	25	NA	0	NA
3 to 4 plants/ft[3]	15	NA	0	NA
3 to 4 plants/ft[4]	10	NA	0	NA
More than 4 plants/ ft	5	NA	5	NA

[1]*Only plant during conditions conducive to rapid, uniform emergence. Less than optimum conditions at planting can result in poor stands or delayed, staggered emergence, both of which can contribute to increased spotted wilt. Note: a twin row is considered to be one row for purposes of determining number of plants per foot of row.*

[2]*It is known that closer planted peanuts tend to have an increased risk to white mold.*

[3]*This category (15 risk points for spotted wilt) is only for varieties with a risk to spotted wilt of MORE THAN 25 points.*

[4]*This category (10 risk points for spotted wilt) is for varieties with 25 point or less for risk to spotted wilt.*

At-Plant Insecticide

Insecticide used:	Spotted Wilt Points*	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
None	15	NA	NA	NA
Other than Thimet 20G	15	NA	NA	NA
Thimet 20G	5	NA	NA	NA

**An insecticide's influence on the incidence of TSWV is only one factor among many to consider when making an insecticide selection. In a given field, nematode problems may overshadow spotted wilt concerns and decisions should be made accordingly.*

Note: *While Thimet is the only insecticide documented to reduce the risk of TSWV, other insecticides may offer good-to-excellent control of early season thrips.*

Row Pattern

Peanuts are planted in:	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
Single rows	10	0	5	0
Twin rows	5	0	0	0

Tillage

Tillage	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
Conventional	15	10	0	0
Reduced*	5	0	5	5

** For fungal diseases, this is does not apply for reduced tillage situations where peanut is following directly behind peanut in a rotation sequence. Limb rot can exist on some types of crop debris and use the organic matter as a bridge to the next peanut crop.*

***"Funky" or "irregular" leaf spot tends to be more severe in conservation tillage than in conventional tillage, though this malady is not typically associated with yield losses.*

Classic® Herbicide*

	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
Classic Applied	5	NA	NA	NA
No Classic Applied	0	NA	NA	NA

**Use of Classic is not recommended for fields planted to Georgia-06G. Research has documented a slight yet consistent yield reduction when Classic herbicide is applied specifically to Georgia-06G.*

Crop Rotation with a Non-Legume Crop.

Years Between Peanut Crops*	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
0	NA	25	25	20
1	NA	15	20	15
2	NA	10	10	10
3 or more	NA	5	5	5

**All crops other than peanut are acceptable in a rotation to reduce leaf spot. Cotton and grass crops will reduce the severity of white mold. Cotton is an excellent crop to reduce risk to the peanut root-knot nematode; however corn is a host for this pest. Rhizoctonia limb rot can still be a significant problem, especially with cotton, under a longer rotation with favorable conditions, e.g. heavy vine growth & irrigation/ rainfall. Rotation with soybeans can increase risk to white mold, Rhizoctonia limb rot, peanut root-knot nematode and CBR. Rotation with grass crops will decrease the potential risk of limb rot; tobacco and vegetables will not.*

Field History

Previous disease problems in the field?*	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
No	NA	0	0	0
Yes	NA	10	15	10

** "YES" would be appropriate in fields where leaf spot and/or soilborne diseases were a problem in the field despite use of a good fungicide program.*

Irrigation

Does the field receive irrigation?	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points	
			White mold	Limb rot
No	NA	0	0	0
Yes	NA	10	5[1,2]	10

[1]*Irrigation has a greater affect on Rhizoctonia limb rot than on southern stem rot (white mold) or Cylindrocladium black rot.*

[2]***Special note:*** *There are times when peanuts grown in non-irrigated fields are at greater risk to white mold than are peanuts planted in irrigated fields. Although (as discussed earlier) irrigation may produce the environmental conditions more favorable for white mold to develop, efficacy of fungicides may be reduced in non-irrigated fields where the water from irrigation could have facilitated relocation of the fungicide to the crown of the plant*

Calculate Your Risk

Add your index values from:

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

Interpreting Your Risk Total

Point total range for tomato spotted wilt = 35-155.
Point total range for leaf spot = 10-100.
Point total range for white mold = 10-95.
Point total range for Rhizoctonia limb rot = 15-75.

Risk

	Spotted Wilt Points	**Leaf Spot Points**	**Soilborne Points**	
			white mold	**limb rot**
High Risk	**≥115**	**65-100**	**55-80**	**To be detemined**
High Risk for fungal diseases: Growers should always use full fungicide input program in a high-risk situation.				
Medium Risk	**70-110**	**40-60**	**30-50**	**To be determined**
Medium Risk for fungal diseases: Growers can expect better performance from standard fungicide programs. Reduced fungicide programs in research studies have been successfully implemented when conditions are not favorable for disease spread.				
Low Risk	**≤65**	**10-35**	**10-25**	**To be determined**
Low Risk for fungal diseases: These fields are likely to have the least impact from fungal disease. Growers have made the management decisions which offer maximum benefit in reducing the potential for severe disease; these fields are strong candidates for modified disease management programs that require a reduced number of fungicide applications.				

Examples of Disease Risk Assessment

Situation 1.
A grower plants **Georgia Green** (30 spotted wilt points, 20 leaf spot points, 25 white mold points) on **May 5** (15 spotted wilt points, 5 leaf spot points, 5 white mold points), with **two years between peanut crops** (0 spotted wilt points, 10 leaf spot points, 10 white mold points, 10 limb rot points) on **conventional tillage** (15 spotted wilt points, 10 leaf spot points, 0 white mold points, 0 limb rot points), **single row spacing** (15 spotted wilt points, 0 leaf spot points, 5 white mold points, 0 limb rot points), in an **irrigated field** (0 spotted wilt points, 10 leaf spot points, 5 white mold points, 10 limb rot points) with **a history of leaf spot disease**, but **not soilborne diseases** (0 spotted wilt points, 10 leaf spot points, 0 white mold points, 0 limb rot points) using **Classic® herbicide** (5 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points), **AgLogic 15G at-plant insecticide** (15 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points) with a **final plant population** of 2.8 plants per foot of row (25 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points).

Points:
Spotted wilt: **120** (high risk) leaf spot: **65** (high risk), white mold: **50** (medium Risk), Rhizoctonia limb rot: **20** (to be determined).

Situation 2.
A grower plants **Georgia-06G** (10 spotted wilt points, 20 leaf spot points, 20 white mold points) on **May 15** (5 spotted wilt points, 10 leaf spot points, 0 white mold points), with **three years between peanut crops** (0 spotted wilt points, 5 leaf spot points, 5 white mold points) on **strip tillage** (5 spotted wilt points, 0 leaf spot points, 5 white mold points), **twin row spacing** (5 spotted wilt points, 0 leaf spot points, 0 white mold points), in an **irrigated field** (0 spotted wilt points, 10 leaf spot points, 5 white mold points) with **no history of leaf spot disease or soilborne disease** (0 spotted wilt points, 0 leaf spot points, 0 white mold points) with **NO Classic® herbicide** (0 spotted wilt points, 0 leaf spot points, 0 white mold points), **Thimet 20G at-plant insecticide** (5 spotted wilt points, 0 leaf spot points, 0 white mold points) with a **final plant population** of 4.2 plants per foot (5 spotted wilt points, 0 leaf spot points, 5 white mold points).

Points:
Spotted wilt: **35** (low risk), leaf spot: **45** (medium risk), white mold: **40** (medium risk).

Situation 3.
A grower plants **FloRun™ '107'** (20 spotted wilt points, 25 leaf spot points, 20 white mold points) on **May 15** (5 spotted wilt points, 10 leaf spot points, 0 white mold points, 0 limb rot points), with **one year between peanut crops** (0 spotted wilt points, 15 leaf spot points, 20 white mold points, 15 limb rot points) on **conventional tillage** (15 spotted wilt points, 5 leaf spot points, 0 white mold points, 0 limb rot points), **twin row spacing** (5 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points), in an **irrigated field** (0 spotted wilt points, 10 leaf spot points, 5 white mold points, 10 limb rot points) with **a history of leaf spot disease, white mold, but not Rhizoctonia limb rot** (0 spotted wilt points, 10 leaf spot points, 15 white mold points, 0 limb rot points) with **NO Classic® herbicide** (0 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points), **Orthene insecticide** (15 spotted wilt points, 0 leaf spot points, 0 white mold, 0 limb rot points) with a **final plant population** of 3.5 plants per foot of row (10 spotted wilt points, 0 leaf spot points, 0 white mold, 0 limb rot).

Points:
Spotted wilt points: **70** (medium risk), leaf spot risk: **75** (high risk), white mold: **60** (high risk), limb rot: **25** (to be determined))

Situation 4.
A grower plants **Georgia-07W** (10 spotted wilt points, 20 leaf spot points, 15 white mold points) on **April 28** (30 spotted wilt points, 0 leaf spot points, 10 white mold points, 0 limb rot points) with **one year between peanut crops** (0 spotted wilt points, 15 leaf spot points, 20 white mold points, 15 limb rot points) on **strip tillage** (5 spotted wilt points, 0 leaf spot points, 5 white mold points, 5 limb rot points), **twin row spacing** (5 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points) in a **non-irrigated** field (0 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points) with **a history of leaf spot, white mold, and Rhizoctonia limb rot** (0 spotted wilt points, 10 leaf spot points, 15 white mold points, 10 limb rot points), with **NO Classic® herbicide** (0 spotted wilt points, 0 leaf spot points, 0 white mold points, 0 limb rot points), using **Thimet at-plant insecticide** (5 spotted wilt points, 0 leaf spot points, 0 white mold, 0 limb rot points) with a **final plant population** of 4.4 plants per foot of row (5 spotted wilt points, 0 leaf spot points, 5 white mold, 0 limb rot).

Points:
Spotted wilt risk: **60** (low risk), leaf spot risk: **45** (medium risk), white mold: **65** (high risk), limb rot: **35** (to be determined)

“Planting Windows” to Attain Low Risk for Spotted Wilt

If planting date were the only factor affecting spotted wilt severity, growers would have no flexibility in when they planted. Fortunately, other factors are involved and by choosing other low risk options, growers can expand their planting date window. Remember, the goal is to have a total risk index value of 65 or less, regardless of which combination of production practices works best for you. The following table demonstrates how the planting date window expands as other risk factors go down. For example, where a grower achieves a good stand, uses strip tillage and twin rows, and Thimet, but does not use Classic, he may plant a “10” or “15” point variety at ANY time in the season and still be at “Low” risk for spotted wilt.

	Points assigned to the peanut variety of interest		
	20	15	10
Production practices and final stand	**Planting date options to achieve a “LOW RISK” for Spotted Wilt using above varieties**		
Poor stand, conventional tillage, single rows, AgLogic 15G, Classic is used	NONE	NONE	NONE
Average stand, twin rows, conventional tillage, Thimet, no use of Classic	May 11-25	May 11-June 5	May 1-June
Good stand, strip tillage, twin rows, Thimet, no use of Classic	After May 1	ANY	ANY