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Texas Peanut Disease and Nematode Control Recommendations



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1984 TEXAS PEANUT DISEASE AND NEMATODE CONTROL RECOMMENDATIONS

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Peanut growers experience disease and nematode losses in their crops each year. Disease and nematode control recommendations in this publication are based on well documented research and demonstration findings. The economic benefit of these recommendations relate directly to each grower's adaptation to soil conditions, crop sequence, water availability and climatic conditions.

SEED ROT AND SEEDLING DISEASE CONTROL

Plant high quality seed treated with a suggested seed protectant fungicide. Seedling disease is less severe when soil temperatures average 70° F. or more at a 2-inch depth at 7 a.m. Suggested dry seed treatment fungicides include Maneb-Captan, Botran-Captan, Arasan, Vitavax-Captan or Difolatan. Suggested flowable seed treatments are Pro-Ized II (Botran + Vitavax) and Pro-Ized III (Botran + Vitavax + Thiram).

A seed treatment product known as ABG 4000 (Gustafson) is available which contains bacterial cells thought to impart a condition which may aid in controlling certain soilborne diseases. Studies are incomplete and future recommendations will be dependent on conclusions drawn from scientifically conducted investigations.

Planter box treatment with materials such as Captan is suggested where seedling disease is prevalent. Use according to label directions.

Vitavax used on Spanish peanut seed may cause marginal leaf burn and reduced seedling vigor. Runner peanuts have not been affected. Increased vigor usually is associated with Vitavax on runner peanuts.

FOLIAR DISEASE CONTROL

Leafspots

Combine chemical and cultural approaches. Rotating with other crops reduces disease organisms in the soil and makes chemical disease control more effective and profitable. Use fungicides within their individual capabilities. Control methods are listed:

Irrigated peanuts - *Spanish* - Begin applications 35 to 40 days after planting and continue at intervals until 20 to 21 days before harvest, depending on the fungicide used and weather conditions.

Florunner - Begin applications 60 to 65 days after planting unless late leafspot is a problem at an earlier stage. Continue as with Spanish.

Dryland peanuts - Follow the same recommendations as for irrigated peanuts if rainfall is sufficient for continuous plant growth and disease development. Under reduced moisture conditions begin fungicide applications at the first evidence of leafspot or when rains or dews favor disease development. Early detection of leafspot requires close observation. Continue applications at suggested intervals through periods suitable for leafspot development. (Dew formation is most consistent in the fall, beginning in September, but may occur anytime.) See table 1 for chemical recommendations.

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Table 1. Recommended fungicide application intervals.

Suggested fungicide	Maximum suggested interval	Can be used as livestock feed?
Bravo	10-14*	No
Difolatan	10-14*	No
Manzate-200 or Dithane M-45	10*	No
Benlate + Manzate 200** or Benlate + Dithane M-45	10-14*	No
Topsin-M	10-14*	No
Super Tin***	7-14*	No
Du-Ter*** WP or WS	7-10*	No
30 F****	7-10*	No
Top Cop	7-10*	Yes
Kocidè 404 S	7-10*	Yes
Kocide 101	7-10*	Yes
Sulfur Dust	7*	Yes
Sulfur Flowable	7*	Yes

* Shorter intervals are necessary when disease pressure is great and weather conditions favor infection.

** Addition of nonphytotoxic oil (60 to 70 viscosity) may increase control.
DO NOT MIX BENLATE + MANZATE 200 + OIL COMBINATIONS WITH OTHER MATERIALS

*** Triphenyltinhydroxide, the active ingredient in both Super Tin and Du-Ter, causes a mild foliage burn under some conditions. Irrigation application at beginning of set eliminates this burn. Do not mix these with any other spray material. Yields are not affected by slight burn.

**** Du-Ter F formulation only recommended through irrigation water

Always read and follow labels carefully.

Chemicals suggested for:

- Leafspot - Any of the above materials or approved combinations.
- Rust - Bravo, Benlate + Manzate 200 + oil or Dithane M-45 (use shorter intervals).
- Web blotch - Materials cleared for control of web blotch on peanuts include Benlate-Manzate 200-oil-combination and Bravo.

Rust

The occurrence of peanut rust is geographically limited and sporadic but can become serious in areas of South Texas during certain years. The fungus has not been observed over-wintering in Texas, and each year spores must be blown in from the Caribbean area. Once established during the growing season, rust can develop rapidly in peanut fields. Apply fungicides effective against rust at regular intervals at the first sign of rust in the field or in nearby fields. See table 1 for chemical recommendations.

Potential Tolerance to Fungicides

Tolerance of the leafspot fungus to benomyl has been reported in some parts of the United States. Even though this has not been a widespread problem in Texas, consider preventive steps. Tolerance develops when a highly selective fungicide with a narrow spectrum of control is used extensively. One spore out of a billion may tolerate the fungicide and not be controlled. When this spore's offspring is not affected by the fungicide it continues to reproduce. After several reproductive cycles, large numbers of tolerant spores may be present in the field. Use of a narrow spectrum fungicide can permit a tolerant strain to develop, but it does not cause it.

Development of tolerant strains can be reduced with one of two approaches:

1. Alternating selective fungicides (benomyl) with non-selective fungicides (chlorothalonil, triphenyltin hydroxide or others).
2. Tank mixes of selective fungicides with other non-selective fungicides (Benlate + Manzate 200).

Application Methods

Foliar fungicides may be applied with ground or air equipment in spray or dust formulations. Any method that evenly deposits the protective fungicide over the entire leaf surface is satisfactory. Ground spray equipment is popular. Use the suggested amount of fungicide in 10 to 15 gallons of water per acre, depending on vine size. Use three open-cone nozzles per row spaced for optimum coverage. Use 5 gallons of water per acre when applying fungicides by air.

To control foliar disease and reduce early season costs make the first three applications with ground equipment. If a three-nozzle arrangement is used, with one nozzle at the top and two on the sides, plug the side nozzles for the first application and use only the top one. Use two nozzles on larger peanuts 10 to 14 days later by plugging the top one and using the two side nozzles. For the third application and throughout the growing season use all three nozzles even though this may damage some vines. Careful use of ground equipment has little adverse effect on yield.

Demonstrations conducted during the last 3 years with Control Droplet Applicators (CDAs) have shown a highly acceptable level of control at total spray volumes as low as 1 gallon per acre. It is logical to consider these units as another method of ground application with units spaced at approximately 40 inches on the boom.

Demonstrations under field conditions show that foliar fungicides applied through sprinkler irrigation systems give control equal to those applied by air and ground equipment. Positive injection of fungicide is necessary for application through center pivot irrigation systems. Continuous agitation of fungicide-water combinations required during the hours the center pivot system circles has caused some problems with fungicide

settling. This is not a problem with side-roll or hand-move systems.

Aerial application of foliar fungicides provides good control. Adequate flagging insures even distribution and avoids swathwidths that are too wide. Stop spraying if the wind is high enough to cause excessive drift or if spray droplets dry before they hit target plants. Stop application if temperatures are above 90° F. and relative humidity is below 45 percent. A visible blanket of spray mixture will appear behind the aircraft when the 5-gallon-per-acre rate is used. This water rate is recommended for optimum control.

POD, PEG AND STEM FUNGAL DISEASE CONTROL

Southern Blight Control

Cultural methods of controlling southern blight include:

- Burying crop residue with a moldboard plow deep enough to avoid bringing it back up during land preparation and cultivation.
- Controlling leafspot with fungicides to prevent leaf shed. Fallen leaves serve as a good source for the southern blight organism.
- Planting on a raised bed. Plant dryland peanuts on a slightly raised bed and irrigated peanuts on a bed approximately 4 inches high.
- Using a herbicide to prevent development of weed and grass residues that may serve as a good source for the southern blight fungus.
- Not throwing soil to peanuts during cultivation.
- Digging when mature.

Chemical control of southern blight is possible with Vitavax or PCNB (Terraclor) when used correctly. Demonstration work in Texas during the last 5 years shows that Vitavax has more ability to knock down an existing problem; however, Terraclor seems to be effective longer than Vitavax. Consider these characteristics when selecting a chemical.

Demonstration work applying PCNB or Vitavax through sprinkler irrigation systems shows excellent results. Southern blight was controlled and yields were increased where this disease was limiting production. Both products are labeled for application through sprinkler irrigation systems in Texas. Follow label directions for application.

Positive disease identification is necessary to get good economic returns from chemical control. For example, PCNB is effective against the southern blight fungus but will not control *Pythium* pod rot fungus. Use chemical control only when southern blight has been identified as the limiting soilborne disease.

Pythium Pod and Root Rot

These diseases are controlled by:

- Avoiding excessive irrigation.
- Rotating with nonrelated crops. If possible, summer fallow during rotation. Use rye or oats as a winter cover crop. Turn this under deeply with other crop residue in the spring. Plant on a raised bed.
- Improving drainage in low areas.
- *Pythium* pod rot is difficult to control. Success with fungicides has not been sufficient to justify recommending their use. Applications of gypsum reduce pod rot where sodium salt accumulations in the soil or irrigation water are high enough to increase the pod rot problem.

Rhizoctonia Pod Rot and Diplodia Collar Rot

Rotating with nonrelated crops lowers populations of these organisms in the soil. *Diplodia* has been less severe in plots where leafspot was controlled with fungicides and where soil temperatures were reduced by vine shading. Plant rye or oat cover crops and turn them under long enough before planting to accomplish initial decomposition. PCNB controls *Rhizoctonia* when used for southern blight control.

NEMATODE CONTROL

Determine whether enough plant parasitic nematodes are present to cause damage. Send a soil sample representative of damaged area, along with peanut pods if available, to: Plant Nematode Detection Laboratory, Texas Agricultural Extension Service, College Station, Texas 77843. Information sheets are available at county Extension offices. Apply recommended nematicides when plant parasitic nematodes limit production.

Use caution when selecting a nematicide since soil moisture is extremely critical. The fumigant-type nematicide, Telone II, works best when shanked 10 to 12 inches into loose soil that is just a bit on the dry side (but not extremely dry) for the top 3 to 6 inches. Excessive soil moisture limits movement of the fumigant in the soil, thus reducing effectiveness and possibly causing plant stunting. All fumigants give fewer problems when applied at least 10 to 14 days before planting. Granular nematicides work best with good soil moisture conditions on the surface where they immediately contact moisture necessary for their activation. As moisture conditions vary from planting season to planting season, growers must consider these moisture requirements when selecting a nematicide. Specific suggested materials are listed in table 2.

AFLATOXIN (SEGREGATION III)

Aflatoxin is produced by a fungus, *Aspergillus flavus*. Most infection and aflatoxin accumulation occur in the soil before digging. Research shows some fields have a higher population of this fungus than others. If peanuts

Table 2. Nematicide.

Material	Manufacturer	Recommendations
<i>Fumigant</i>		
Dichloropropene-Telone II	Dow	4.5 to 6* ga/acre. Inject 10 to 12 in deep in well-prepared soil, not excessively wet. Allow 7 to 14 days before planting, longer time for colder soils
<i>Contact</i>		
<i>Carbofuran (10% granule)</i> Furadan 10G	FMC and Mobay	20 to 40 lb/acre incorporated into top 3 to 6 in over row. Do not feed treated peanut foliage to dairy animals or animals being finished for slaughter.
<i>Aldicarb Temik (15% granule)</i>	Union Carbide	14 to 20 lb/acre in 6 to 12 in band preplant or at planting, incorporated 2 to 4 in. Do not feed hay or vines to livestock.
<i>Aldicarb Temik (15% granule)</i>	Union Carbide	5 to 7 lb/acre in 6 to 12 in band at planting incorporated 2 to 4 in. Plus, 10 lb/acre over row at peg with light incorporation. Do not feed hay or vines to livestock.
<i>Phosphorothioate Dasanit 15G</i>	Mobay	Band 13 ¹ / ₃ to 26 ² / ₃ lb/acre (36 in row spacing) incorporate at planting or preplanting. Do not feed hay to livestock.
<i>Fenamiphos Nemacur 3</i>	Mobay	Band 2 to 3.3 qt/acre (36 in row spacing) incorporate at planting. Broadcast 1 to 1.7 gal/acre incorporate at planting. Do not feed hay to livestock.
<i>Fenamiphos Nemacur 15G</i>	Mobay	Band 10 to 17 lb/acre (35 in row spacing) incorporate at planting. Broadcast 20 to 33.5 lb/acre incorporate at planting. Do not feed hay to livestock.

* Demonstration work shows that maximum rates and placement depths result in excellent control of root knot nematodes.

Data collected under Texas conditions are not sufficient to allow recommendations of other nematicides marketed for peanuts.

from a field have this condition consistently, consider rotating with other crops. Peanuts under drought stress are more susceptible to field infection. Avoid this condition by irrigating, if this option is available. During the season, control insects or other forms of pod injury.

When soil temperatures range from 80° to 100° F. and peanut kernel moisture drops below 25 percent, conditions for fungal development are ideal. Hot soils reduce growth of some organisms antagonistic to *A. flavus*. Reduced kernel moisture and high soil temperatures before harvest usually increase segregation III peanuts.

Some mold damage and aflatoxin accumulation develop during harvesting and curing. Use inverter diggers to keep pods off the soil surface while curing within the window. Adjust combines to prevent pod damage and transport peanuts in vented trucks and trailers to prevent heating. Force air through the truck or trailer. Dry as soon as possible according to recommended procedures.

organisms. Although both runner and Spanish peanuts are affected by *Pythium* pod rot and southern blight, the runner types suffer the most damage. Give runner types extra consideration when chemical treatments are required.

Both Spanish and runner peanuts can be heavily damaged by root knot nematodes; however, the extra 30 days needed to mature the runner type magnifies their damage potential. Split applications of nematicides may be more necessary for the runner variety.

Foliage disease organisms attach both Spanish and runner varieties. Spanish varieties are more susceptible to web blotch. *Cercospora* or early leafspot can devastate both types but is usually worse on Spanish varieties. With the extended growing season of runner peanuts and their partial tolerance of early leafspot, late leafspot often is the most predominant foliage disease on them. Consider all these factors when planning a spray program.

VARIETY OF TYPE CHARACTERISTICS

Peanut varieties differ in their susceptibility to disease

OTHER DISEASE PROBLEMS

Aspergillus niger

Additional disease organisms, for which there are

inadequate control recommendations, pose a real threat to some peanut producers in Texas. One of these which, for the lack of a better name, will be referred to as "black mold" and is caused by the fungus *Aspergillus niger*. This fungus can cause plant death at any stage from seedling to harvest. The fungus attacks the crown or collar area near the soil line and soon girdles and kills the plant. The black, slightly fluffy growth at the ground line is the best field diagnostic symptom.

Sclerotinia sp.

Another disease caused by a species of the fungus *Sclerotinia* and referred to as sclerotinia blight was observed for the first time in Texas peanuts in 1981. Characterized in the early stages by small white tufts of cottony-like growth on the stems near the ground line, the fungus spreads rapidly. Later stages of the disease show up as severe plant stem shredding, almost as if the stems had exploded, accompanied by the production of many small, black, irregular-shaped sclerotia that are approximately the size of mustard seed. The distinguishing field diagnostic symptom is plant death, accompanied by stem shredding. At first glance many may confuse this disease with southern blight, caused by the fungus *Sclerotium rolfsii*. This mistake can be devastating because chemicals that control southern blight have no effect on sclerotinia blight.

The Texas Department of Agriculture granted a temporary, special local-need Section 18 label for the Upjohn Company product, Botran, and the BASF product, Ronilan, for Mason and surrounding counties for 1983. It is hopeful that these labels can be expanded and renewed for 1984 and succeeding years. A multi-year rotation, in conjunction with deep burial of crop residue, would also be helpful. Reports from other states and observations from Mason, Texas, show the *Sclerotinia* problem is more severe on florunner than Spanish varieties and then only after complete ground cover is achieved. Allowing the soil to dry out with the accompanying temperature increase also appears to help control the organism.

Virus Diseases

Tomato Spotted Wilt (TSW) and Peanut Mottle Virus (PMV) are the two most common virus problems in Texas peanuts. Neither is known to cause significant damage. TSW causes reduced plant size in conjunction with a spotted, wilted plant. It is transmitted by thrips. Control of alternate host weeds in and around the fields helps control the problem. PMV is probably the more common virus disease. It is characterized by slight cupping and irregular growth of leaves. When held up to the light, leaves display a mottled appearance. There is a low level seed transmission of this virus.

