



Current Report

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1980 PEANUT DISEASE CONTROL GUIDE

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Peanut disease losses vary from year to year with weather and control practices having a great influence on disease incidence and loss. Each year disease costs the Oklahoma peanut grower thousands of dollars with the 1979 season loss estimated at \$20,106,555. The total 27.1% disease loss could not have been prevented, however, at least 11.5% of this loss could have been prevented with early detection and using available disease control practices. This 11.5% loss estimate is based on actual disease control research and demonstration results and amounts to about \$2,312,254.00.

SEEDLING DISEASE CONTROL: The young peanut seedlings have little or no natural resistance to the many soil pathogens; hence, peanut seeds and seedlings must depend on fungicidal protection for stand establishment. Many soil organisms capable of causing seed rot or seedling blight are found in Oklahoma peanut soils. Seedling disease is generally caused by a combination of organisms, thus, we call it a seedling disease complex.

CONTROL: Fungicide seed treatments are needed to protect the seed from rot and seedling death before and after emergence. The fungal pathogens most commonly involved in the peanut seedling disease complex are *Rhizoctonia solani*, *Pythium* sp., *Fusarium* sp., *Sclerotium rolfsii* and *Aspergillus niger*.

The value of chemical seed treatment has been proven repeatedly and provides low-cost insurance against poor stands. Seed treatment does not improve quality of the seed but protects the seed and aids in maintaining the quality of germination within a seed lot from time of treatment to planting. When Oklahoma growers purchase commercially-treated seed, they should insist on seed being treated with fungicide seed treatments proven to be effective under Oklahoma conditions.

STAND ESTABLISHMENT: Starting the season with a healthy peanut plant is an important part of the peanut health program and the first step to a successful season. Oklahoma growers usually face cool, wet periods after the peanuts are planted which encourages seedling blight and produces unfavorable soil conditions for plant growth. This becomes a greater problem with more growers planting earlier to avoid wet fall Pod rot disease conditions and to attain a longer growing season for the runner peanuts. The earlier planted Florunner and Spanish type peanuts seemed to be less affected by the Pod rot disease. There is evidence that the infected peanut seedling can be an important host of the Pod rot disease causing fungi. *Fusarium*, *Rhizoctonia* and/or *Pythium* can infect the young seedling producing dark-brown lesions at the ground level or on the roots. The young plant may survive in a weakened condition, later die when subject to stress conditions; however, in most cases these plants will live and be an important inoculum source of Pod Rot.

Soil fungicide applied infurrow and in the covering soil is needed to protect the peanut seedling as it grows up through the fungal infested soil. The soil fungicide Terraclor (PCNB) is used in addition to seed treatments, not in place of them. Terraclor can be applied as dust, granule or spray. The seed treatment alone is not enough and cannot provide the protection needed by the emerging seedling. Research has shown that the combination of a fungicide seed treatment and a soil fungicide applied at planting as an infurrow and incorporated in the covering soil are needed to insure healthy peanut seedlings.

FUNGICIDES FOR PEANUT SEED TREATMENT (SHELLED) IN OKLAHOMA - 1980¹

FUNGICIDES ²	RATE - OUNCES FORMULATION PER 100 lbs
Arasan 50-Red (Thiram)	4.5
*TSP 75 (37.5 + 37.5)	4
**Granox PFM (30 + 30)	6
***Botec (30 + 30)	6
Difolatan - Botran (35 + 35)	5
Vitavax 75 ³ - Thiram	3-6
Vitavax 75 ³ - Captan	3-6
Terra-Coat L-205 or SD205	2-4

¹Suggestions based solely on research obtained in Oklahoma. Terra-Coat L-205 or SD205 formulations should be used only with infurrow-band application of Terraclor at 2 lb ai/acre.

²Trade names are used rather than the chemical name for brevity and clarity. However, this does not imply that one formulation or trade name is recommended over others containing the same active ingredients.

³Livestock grazing and feed restrictions - CHECK LABEL.

- * Maneb-Captan
- ** Maneb-Captan Molybdenum
- *** Botran Captan

FUNGICIDE SUGGESTED AT PLANTING FOR CONTROL OF PEANUT SEEDLING DISEASES IN OKLAHOMA - 1980 ^{1/}	
Fungicide & Rate Formulation/Acre	Method of Application
Terraclor 10G 20 lbs (2 lbs ai)	Apply 10 lbs in seed furrow and incorporate 10 lbs in covering soil.
Terraclor 2EC 1 gal (2 lbs ai)	Spray into seed furrow and covering soil.

^{1/} Suggestions based on research obtained in Oklahoma.

SOUTHERN BLIGHT CONTROL: Southern blight, sometimes called Southern stem rot, is caused by the fungus *Sclerotium rolfsii*. Disease losses vary from year to year and field to field. Southern blight can be partially controlled with cultural practices, however, there are many fields in which this disease causes heavy loss regardless of crop rotation or maintenance practices.

Southern blight usually does not become a problem until mid to late season. In Oklahoma this would be about the first of August or with development of heavy plant foliage. The first symptoms are yellowing and wilting of plants. White coarse thread-like mycelium is usually found at the base of the wilting or dying branch. Round, brown mustard seed-like sclerotia can be found on the older-mature mycelium mats. The Southern blight fungus can work underground causing a rot of the pods, pegs and roots. The disease damage is normally found at the soil level, in the crown of the plant and in the pegging zone of the soil.

CONTROL: To effectively control Southern blight and other damaging soil fungi applications of Terraclor (PCNB) or Vitavax may be needed. Terraclor (formulations) or Vitavax in combination with certain control practices are suggested for control of Southern blight in Oklahoma peanut soils.

SUGGESTED GROWER'S USE: To control Southern Blight and certain pathogenic soil fungi in peanuts, the following practices are suggested in combination with the soil fungicides Terraclor and/or Vitavax - use as listed:
 1) Deep plowing to bury old plant parts reduces pathogen buildup; 2) Plant on a bed, allowing drainage and drying of the soil at base of plant; 3) Avoid burying leaves or plant parts during cultivation; 4) Control the leafspot diseases to prevent defoliation and reduce the pathogen's food supply; 5) Control weeds; 6) Properly timed irrigation allows drying of top soil at base of plant.

The application of Terraclor 2EC (liquid) at 5-10 qts per acre through an overhead irrigation system has proven very effective for control of certain soil fungi. Make first application about mid-season followed by one or two applications in late season with last application at least 45 days prior to harvest. Soil types will govern how much water should be applied to drench Terraclor into the soil. Light sandy soils will need less water to move the chemical into the soil, hence, too much water on the lighter soil may reduce the effectiveness of Terraclor 2EC by moving it too deep.

Curative type control of Southern blight has been obtained with Vitavax 3F at 2 pints/acre applied by overhead irrigation. Aerial application of 30 to 50 lbs/acre Terraclor 10G will also provide very effective control of Southern blight after the fungus has become well established in fields where heavy leaf canopy is formed and soil is wet. Seemly gases given off from the breakdown of the granular Terraclor when it comes in contact with the wet soil is held in the infected area by the heavy leaf canopy and providing very effective control of the Southern blight fungus.

SOUTHERN BLIGHT CONTROL FOR VITAVAX 3F ON PEANUTS IN OKLAHOMA 1980

TIME AND TYPE OF TREATMENT	FUNGICIDE AND RATE FORMULATION/ACRE	METHODS OF APPLICATION
Overhead Irrigation (Split application)		
1st-When disease appears	Vitavax 3F 2 pts	Inject into overhead irrigation system during regular irrigation or as special application
2nd-If disease re-appears	Vitavax 3F 2 pts	

FOLLOW LABEL DIRECTION FOR RESTRICTIONS AND PRECAUTIONS.

SPLIT APPLICATION PROGRAM SUGGESTED FOR TERRACLOR (PCNB) ON CONTROL OF SOUTHERN BLIGHT IN PEANUTS FOR OKLAHOMA - 1980¹

TIME AND TYPE OF APPLICATION	FUNGICIDE AND RATE FORMULATION/ACRE	METHODS OF APPLICATION
<u>Pegging or Mid-Season - July</u>		
Banded: 12 to 14 inch band over row or	Terraclor 10G 30 lb (3 lbs ai)	Applied during cultivation and incorporated or watered into soil.
Broadcast: Overhead Irrigation or	Terraclor 2EC 5-6 qt (2.5 to 3 lbs ai)	Injected into overhead irrigation system.
Aerial	Terraclor 10G 50 lb (5 lbs ai)	Apply prior to cultivation or water into soil.
<u>Late Season August - September</u>		
Broadcast: Overhead Irrigation or	Terraclor 5-6 qt (2.5 to 3 lbs ai)	One or two applications as needed with regular irrigation
Aerial	Terraclor 10G 30- 50 lb (3 to 5 lbs ai)	One application-- apply to wet soil or water into soil.

Note: Do not exceed 10 lb actual PCNB per acre in any one season regardless of the application methods needed.

¹Suggestions based on research obtained in Oklahoma.

SCLEROTINIA BLIGHT CONTROL: Sclerotinia blight sometimes called white mold, caused by the fungus *Sclerotinia sclerotium* has become a very serious problem for the Northern peanut growing area of Oklahoma. The disease seems to be restricted to the peanut production area north of a line drawn across the state through Ardmore. Sclerotinia likes cool-moist conditions, hence, rains, cool cloudy weather with overhead irrigation encourage heavy disease buildup. Sclerotinia blight symptoms closely resemble that of Southern blight caused by the fungus *Sclerotium rolfsii*, hence, many growers fail to distinguish between the two diseases. Misidentification causes many growers to apply the wrong fungicide. Fungicides that control Southern blight do not control Sclerotinia blight. Identify Sclerotinia fungus by soft-white cottony mycelium normally not on soil with black small oblong or odd shaped sclerotia. Southern blight fungus coarse thread-like white mycelium may be in the soil has small round tan-brown mustard seed-like sclerotia. Botran 75W has been available for use the past two years under an emergency 18C label and when properly applied will control Sclerotinia blight. The curative program has been more effective than preventive program. CURATIVE PROGRAM: Apply Botran 75W at 3 lbs ai/acre (4 lbs product) by overhead irrigation after disease has been identified. Control has been reported with aerial application of the curative program. See Current Report on Sclerotinia Blight.

PEANUT POD ROT DISEASE CONTROL: The Pod rot disease can be caused by a complex of soil pathogens and the primary causal agents seem to differ within fields and between fields. Microclimates and soil conditions influence the fungal pathogen's role in this disease complex and can greatly influence disease severity. Fungal species of *Rhizoctonia*, *Fusarium* and *Pythium* are associated with the Pod rot disease complex. Root knot, Lesion and Ring nematode population feeding on the pods influence the disease severity. The number of pathogens and environmental factors involved in development of the disease make it extremely difficult to control. Hence, the control practices we presently have to recommend only reduce disease losses and do not fully control the problem.

The following practices are suggested: 1) Rotation with non-related crops; 2) Improve field drainage in low areas; 3) Plant tolerant varieties (Spanish varieties are more tolerant than Flo-runner); 4) Supply adequate nutrients (major and minor elements); 5) Apply herbicide properly; 6) Plant early; 7) Plant on bed; 8) Apply Terraclor liquid or granule; 2 lbs ai/acre infurrow-band at plant (1 lb ai in seed furrow and 1 lb ai incorporated in covering soil); 9) Control the parasitic nematodes throughout the season; 10) Apply gypsum in pegging zone; 11) Manage irrigation; 12) Terraclor 2EC at 5 to 6 qts/acre repeated applications during the season by overhead irrigation or Terraclor 10G at 50 to 80 lbs broadcast mid to late August.

NEMATODE CONTROL IN PEANUT SOILS: Nematodes are very small, slender, round worms living in the soil of Oklahoma peanut fields. Root-knot, Lesion and Ring nematodes are known to be a problem in many fields, causing severe reduction of yield increasing soil disease severity or doing so much damage that a crop cannot be grown profitably. Crop rotation is effective in controlling the Root-knot nematode; however, rotation is not effective against the Lesion nematode, and when one cannot afford to rotate, chemical control should be considered. See Fact Sheet #7603.

Nematode control by chemicals or crop rotation depends upon a positive identification of nematode species involved. **Root-knot control:** Crop rotation with small grains or nematicide applied at plant or prior to planting. **Root lesion control:** Due to wide host range, rotation is not practical. Nematicide applied at pegging has given excellent increases in yield; however, at-plant followed with a mid-season nematicide application has given greatest yield response. **Ring nematode** can be controlled with any of the suggested nematicides.

Several nematicides are available which, when properly applied, will provide control of both Root-knot, Ring and Lesion nematodes for one season. All nematicides are poisonous and should be used with extreme caution.

SUGGESTED CHEMICAL CONTROL FOR NEMATODES IN PEANUTS IN OKLAHOMA - 1980¹

RATE OF FORMULATION/ACRE	ROW APPLICATION
DD Mixture 10 gal (Broadcast), or Telone II 4.5-6 gal. (42" row)	Inject 8" deep with chisel in planting bed 1-2 weeks prior to planting.
Soil Brom 90EC .75-1.5 gal (Row Treatment)	Inject 8" deep with chisel or rolling coultter in planting bed or row with suitable metering equipment, 7 to 21 days prior to planting.
Terr-O-Cide 72-27(Row treatment) 1-2 gal	Inject 8" deep with chisel or rolling coultter in planting bed or row with suitable metering equipment, 3 to 7 days prior to planting.
Dasanit 15G 20-26 lb (36" row spacing)	12-14" band incorporation at planting. Not to exceed 7 lb ai/a total for season. Feeding restrictions. Do not use infurrow.
Mocap 10C 30-40 lb (36" row spacing)	15" band incorporation at planting and/or pegging not to exceed 4 lb ai/a total for season. Do not use in furrow.
Nemacur 15G 20-33.5 lb (36" row spacing)	12-14" band incorporation at planting. Feeding restrictions. Do not use infurrow.
Furadan 10G 20-40 lb (36" row spacing)	Apply in a 12" band over the row and incorporate 3-6" at plant and at pegging when needed.
Temik 15G 14-20 lb (36" row spacing)	Apply in seed furrow or banded (6-12") and incorporate 3-6" at plant and at pegging when needed. Do not use high rate infurrow.

¹Chemicals have been tested under Oklahoma conditions and proven effective. Livestock feeding restrictions. SEE LABEL.

Use banded application for Root Knot Nematode control.

BEFORE USING SUGGESTED CHEMICALS, READ THE LABEL AND FOLLOW MANUFACTURER'S DIRECTIONS EXACTLY.

FOLIAR DISEASE CONTROL ON PEANUTS: Foliar diseases have become more severe with the heavy growth of foliage produced with increased plant populations and irrigation practices. There are many foliar diseases that attack peanuts, however, the leafspots continue to cause the greatest losses to the Oklahoma grower.

Early leafspot - *Cercospora arachidicola* and Late Leafspot - *Cercosporidium personata* occur on leaves, stems, and pegs as dark, round or elongated spots ranging up to more than one-fourth inch in diameter. Lesions on the leaves infected with Early leafspot are surrounded by a yellow halo of varying widths. Lesions produced by the Late leafspot fungus are darker in color than those of Early leafspot. Premature shedding of leaves results from both Early and Late leafspots as infection develops. These fungi can move down the stem to pegs. The pegs are weakened, hence many peanuts are left in the ground when the infected plants are dug.

"Web blotch", a foliar disease is known to be quite destructive and quite difficult to control. Growers should become more familiar with the "Web blotch" symptom and specific methods of control.

The first evidence of Web blotch is a dark greenish-gray blotch in a web-like pattern on the upper side of the leaf. The lower surface of the leaf is usually free from developing symptoms. As the infection develops the blotch symptom becomes darker and becomes evident on the lower side of the leaf.

Early symptoms may be confused with air pollution damage, which we have labeled "Environmental bronzing". Good control of "Web blotch" can be obtained with certain fungicides (see suggested list). However, a short spray interval must be maintained (7-10 days), with good leaf coverage (high water gallonage, 5-21 gal/acre are needed).

Tank mixes of certain fungicide combinations or alternating different fungicides in a program play a very important role in controlling "Web blotch" and discouraging the development of fungicide resistant races of "Cercospora leafspot" and other foliar diseases in Oklahoma.

Foliar diseases can be controlled with fungicides properly applied as dusts or as sprays. Fungicide applications must begin before disease becomes established in the field, because fungicides are leaf protectants. They do not cure or eradicate infection already in the leaf.

A fungicide must be on the leaves before the spores land to prevent infection and continued applications are needed to protect new leaves from future infections.

For best control, start the spray program early when the first leafspot symptoms appear in the field. Normally, this is 25 to 45 days after the plants emerge, however, with close monitoring growers can in most cases save 1 to 2 of the early fungicide sprays. Many growers prefer to begin their fungicide applications before the disease appears to insure a full-season control program. Adjust application interval to environmental (weather) conditions and location within the State

Growers in the drier areas of the State should expect to apply 6 to 8 fungicide applications at 10 to 14-day intervals, and 8 to 10 fungicide applications at 7 to 12-day intervals should be applied in heavy rainfall areas and low-bottom areas having extended periods of high humidity. It is very important to control the Early and Late leafspot diseases, especially during the end of the season and not allow them to cause heavy defoliation nor infect the pegs. The late season spray program can return the greatest dividends.

FOLIAR DISEASE CONTROL PROGRAM

- (1) Select a tested and proven fungicide;
- (2) Start spray program with disease occurrence;
- (3) maintain proper interval;
- (4) Obtain good fungicide coverage and
- (5) Continue applications until within 2 weeks of digging.

There are many excellent commercial fungicides available. The greatest problem is proper TIMING and proper APPLICATION with either aerial or ground rig application. The performance of certain fungicides can be improved by adding a sticker-spreader, read the label use sticker-spreader only if recommended by the manufacturer.

FUNGICIDES RECOMMENDED FOR FOLIAR DISEASE CONTROL ON PEANUTS IN OKLAHOMA - 1980

RATE OF FORMULATION/ACRE	CERCOSPORA	RUST	WEB BLOTCH
Benlate 50W 8 oz * ¹	X		
Bravo 500 1.5-2 pt *	X	X	X
CITCOP 4E 2-3 qt** ²	X		
Copper Count N 1/2-3/4 gal ** ²	X		
Difolatan 4F 3 pt *	X		
Dithane M-45F 1.3-1.7 qts*	X	X	X
Dithane M-45 1.5-2 lb *	X	X	X
Du-Ter 6-8 oz * ³	X		
Kocide 101 1-1.5 lb ** ²	X		
Kocide 404S 2 qt**	X		X
Manzate 200 1.5-2 lb *	X	X	X
Sulfur-Copper (WP combinations) 7.5 lbs**	X	X	
TOP-COP with Sulfur 2-3 qt **	X	X	
Kocide FS 2-4 qt **		X	
Super-Six 2 qt **		X	
THAT FS 2-4 pt **		X	

* Livestock feeding restrictions. Check label.

** No restrictions on use for livestock.

¹ To avoid possible occurrence of tolerant Cercospora strains "Tank-Mix" Benlate 50W 4 oz + Manzate 200 1.5 lb + 1 qt crop oil per acre.

² For broader spectrum of control mix with 2 qt of the flowable sulfur per acre.

³ To avoid possible leaf burn, do not add surfactants, spreaders, or stickers to Du-Ter fungicide sprays or use in combination with emulsifiable concentrates or oil spray formulation.

PLANT GROWTH REGULANT: Kylar 85, a water soluble growth regulant for peanuts, can enhance a fungicide spray program by maintaining a more upright, open plant, allowing more efficient application of the fungicide. Uniform or complete leaf coverage is essential in a good leafspot control program and insures better results from Kylar.

High rates of water used in your spray program will aid in obtaining the complete coverage desired. No less than 5 gallons of water per acre is suggested with aerial application, and 20-25 gallons per acre with ground-rig.

Suggested use of Kylar for irrigated peanuts:

- (1) Apply 1/2 lb at 60 , 1/2 lb at 75, and 1/2 lb at 90 days after planting;
- (2) No application later than 30 days before harvest.

The producers of Kylar 85 suggest: (1) Do not spray when plants are under stress; (2) Kylar 85 may be applied at any time during the day, but best results can be expected with applications made early in the day and (3) Applications should be delayed if rain is expected within 12 hours.

FUNGIGATION

Fungicides applied by overhead irrigation systems have proven effective in control of certain foliar diseases. The fungicide can be injected into the hand-line or side-roll systems at beginning of regular irrigation or in last 30 minutes. Fungicide application can be made through the center-pivot or walking-gun during the full irrigation period by using a proportioning injector pump.

Bravo 500 and Duter fungicides have been tested and are labeled for application by overhead irrigation systems in Oklahoma. Best control has been obtained at the higher rates recommended for ground-rig and aerial application.

FUNGICIDES CLEARED FOR FUNGIGATION APPLICATION ON PEANUTS FOR FOLIAR DISEASES IN OKLAHOMA - 1980 1/

FUNGICIDE RATE OF FORMULATION/ACRE	CERCOSPORA	WEB BLOTCH
Bravo 500 1.5-2 pt *	X	X
Du-Ter 8 oz *	X	

1 Recommendations based on research obtained in Oklahoma.

* Livestock feeding restrictions. Check label.

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