Peanut Production Guide

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Peanut production is concentrated in three major geographic areas of the United States: the Southeast, Virginia and the Carolinas, and the Southwest. There are four major market types of peanuts: Virginia, runner, Spanish, and Valencia. In the Southeast, Florunner, a runner type of peanut, is commonly planted. Almost all peanuts planted in Virginia and the Carolinas are Virginia peanut varieties. Plantings in the Southwest are divided between Spanish (55%), runner (42%), and Valencia (3%). New Mexico produces most of the Valencia peanuts.

VARIETIES FOR NEW MEXICO

While several major market types of peanuts can be grown in New Mexico, Valencia varieties are the most suitable for the climate, soil, length of growing season, market demand, and yield. Three strains of Valencia peanut are commonly grown in New Mexico: Valencia A, Valencia C, and McRan.

Valencia Market Type

Valencia A, the principal Valencia variety produced in the United States and grown primarily in New Mexico, is typically marketed as an in-shell edible peanut. The Valencia A variety, descended from an older Tennessee Red variety, has a bunch growth habit. The cultivar, designated experimentally as A200, was released by NMSU's Agricultural Experiment Station in 1971 as NM Valencia A. Considering all peanut types, this variety has the greatest proportion of three- and four-seeded pods.

Valencia C, also a red-seeded variety, was selected for its high percentage of three- and four-seeded pods. It comes from a line of progeny selected from irradiated Colorado Manfredi seed, which were pure-line selections from Colorado de Cordoba seed introduced from Argentina. Valencia C emerges 1 to 3 days later than the Valencia A. However, by mid-season, Valencia C peanuts have matured to the same extent as Valencia A. Valencia C has a larger seed and a higher percentage of sound, mature kernels than other Valencia varieties. Valencia C was released by NMSU's Agricultural Experiment Station in 1979.

A third Valencia variety, McRan, is a protected plant variety under New Mexico's Plant Variety Protection Act. The seed is selected for three- and four-seeded pods that have limited constriction and containing full, touching, flattened seed.

Other Varieties

Other peanut varieties are available to New Mexico producers. Given proper moisture, fertilizers and growing conditions they may perform quite well. These varieties include Spanish and runner market types.

LAND SELECTION, CROP ROTATION, AND SOIL PREPARATION

Land Selection

Soils best suited to peanut production are well drained, light-colored, loose, friable, sandy loams that contain high levels of calcium and a moderate amount of organic matter. Optimum peanut production occurs on land with a topsoil depth of 1.5 to 2 feet with a friable sandy loam or clay

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loam subsoil. Better yields may be obtained with heavier textured soils, but these soils tend to adhere to the pods, causing discoloration that reduces market quality and value and often increases percentages of foreign material at harvest. Avoid planting peanuts in fields with shallow topsoil or in poorly drained areas.

Crop Rotation

Peanuts are extremely sensitive to the effects of other crops grown in rotation with them, especially the crop that immediately precedes them.

Peanut seedling diseases may be more pronounced and damaging when peanuts follow peanuts or cotton. Leaf spot and web blotch diseases usually are more severe when peanuts follow peanuts. *Verticillium* and *Fusarium* wilts can increase when peanuts follow potatoes and other vegetable crops.

Grass-type crops such as corn, grain sorghum, millet, or other small grains are the crops of choice to immediately precede a peanut crop. Fertilization requirements of these grass-type rotation crops can contribute to residual soil fertility for the following peanut crop. The deeper root systems of peanuts can use soil nutrients that may have leached below the shallower root zones of most grass-type crops. Rotating peanuts with grass-type crops reduces the incidence of southern blight, *Pythium*, and some soil nematodes. Grass-type crops do not serve as hosts for these diseases and can reduce the quantity of potentially infective disease inoculum for subsequent peanut crops.

However, any rotation program will have some problems. Without the addition of organic materials such as manure or compost, freshly broken-out pasture land typically has too low an organic content for good peanut production. Land previously in corn and grain sorghum may have herbicide residues (the s-Triazine type) that could carry over and damage a following peanut crop. Slow decomposition of large stalked corn residues can encourage peanut pod rot and pod discoloration.

Soil Preparation

Soil preparation is very important in reducing the potential for peanut diseases. Allow time between decomposition of previous crop residue and growth of a subsequent peanut crop to reduce the numbers of soil fungi involved with the decomposition process. Approximately three months before planting, fields should be plowed as deep as necessary to turn under all surface residues. Adequate soil moisture and nutrients should be available to enhance decomposition of crop residues. It may be necessary, in the case of large-stalk residues, to add nitrogen to assist in the growth of soil microbes that are responsible for residue decomposition. Nitrogen not used by the decomposition process normally will be available for the peanut crop. Row spacing at 36 or 38 inches produces more disease-free crops requiring less fungicide and higher economic yields than other spacings.

SOIL FERTILITY

Fertilizer requirements for each field should be determined on the basis of laboratory soil analyses. A balanced fertility program, with emphasis on available levels of phosphorous, potassium, magnesium, and nitrogen, is essential to high yields. Late January or early February are optimum times for performing necessary analyses. Following fertilizer recommendations based on the laboratory analysis for each field and yield goal is important. Heavy rates of potassium-containing fertilizers applied to the pegging zone can interfere with calcium uptake for developing pegs and pods. Soils of the eastern peanut-growing region of New Mexico typically have adequate available calcium in the pegging zone for Valencia varieties.

Certain micronutrients, including zinc, iron, manganese, copper, boron, and molybdenum, also are essential to peanut production. Boron deficiency impairs normal seed development and causes hollow heart. Hollow heart is an irregularly shaped blackened cavity on the inner face of the peanut seed. The condition is classified as concealed damage. Evidence from field studies indicates the symptoms of boron deficiency are more likely to occur at high yield levels. Soils testing less than 1 lb/A (1.12 kg/ha) should be considered for boron application. Only apply boron when there is a deficiency because too much boron can be harmful to yield and quality.

Zinc-deficient soils also can reduce crop yields. Soils are deficient if the DPTA extractable zinc concentration is less than 0.4 ppm. Zinc deficiencies can occur in alkaline soils that are low in organic matter and high in available phosphorous. In addition to adding zinc fertilizers, adding large amounts of organic materials, such as barnyard manure, and incorporating plant residues are also helpful. The most common recommendation for inorganic zinc fertilizer application is 6 to 10 lb/A (6.7 to 11.2 kg/ha). Zinc remains available in the soil for several years, although it may be tied up with phosphorus. Soils should be tested before adding zinc.

Symptoms of zinc deficiency can occur concurrently with symptoms of iron deficiency. The chlorotic strips of zinc deficiency are usually wider than those of iron deficiency on the portion nearest the petiole and may not run the entire length of the leaflets. High temperatures can cause zinc deficiency to appear as leaflet bronzing. Zinc-deficient plants also may be stunted.

Soils in eastern New Mexico's peanut-producing region are generally alkaline. Alkaline soils also may be deficient in copper, manganese, and available iron. Nutrient deficiencies, with the exception of iron, can be corrected by applying the required elements before or at planting time. Iron deficiency in peanuts can be corrected with foliar applications of iron chelates or iron sulfates. Applying iron through irrigation systems is not as efficient as foliar applications of chelates or sulfates. Soil applications of iron may cause the iron to be chemically bound and unavailable.

Although peanuts are legumes and can provide some of their own nitrogen (table 1), soil-available nitrogen is required by young seedling plants. Healthy, vigorous seedlings can be ensured with 10 to 20 lbs/A of starter nitrogen. If soil tests indicate this much nitrogen carry-over is available from the previous crop, additional nitrogen may not be necessary.

Most producers in eastern New Mexico use up to 100 lbs/A nitrogen fertilizer to ensure adequate nitrogen throughout the growing season. Although nitrogen boosts yields, additional nitrogen may increase disease problems by causing more extensive vine production, which results in canopy closure earlier in the growing season.

Table 1. Approximate plant nutrient content of a peanut crop.

	Nutrients in crop of 2,000 lb/A		
Fertilizer	In tops	In pods	Total
Nitrogen (N)	90	75	165
Phosphorus (P_2O_5)	23	15	38
Potassium (K_20)	80	11	91
Calcium (Ca)	45	2	47
Magnesium (Mg)	16	2	18
Sulfur (S)	14	4	18
Zinc (Zn)	0.2	0.01	0.21
Iron (Fe)	0.5	0.01	0.51
Manganese (Mn)	0.4	0.01	0.41
Copper (Cu)	0.025	0.005	0.03
Boron (B)	0.05	0.03	0.08
Molybdenum (Mo)	0.01	0.01	0.02
Chlorine (Cl)	Variable	-	-

Source: Peanut production in Texas, Texas Agricultural Experiment Station, Bulletin RM3 (1975).

SEEDING

Valencia peanut varieties are typically planted at 75 to 100 lb/A. Lower seeding rates are more commonly used on single-row beds, while the higher rates are used on double-row plantings. Plant populations vary from 60,000 to 80,000 plants per acre. There usually is no economical increase in productivity with increased seeding rates.

Seeding depth should be between 1.5 and 2.0 inches. If topsoil is moist, seeds placed at shallower depths usually germinate quickly. During dry conditions or drought years, seeds may have to be planted deeper into available moisture for germination. The shorter the period between planting and actual seed germination, the less the susceptibility to soil-borne disease and insect problems.

In all areas of New Mexico, planting should be delayed until the soil at seed depth has warmed sufficiently for rapid germination and seedling emergence. Peanut seeds have a minimum soil temperature requirement for germination that varies with variety. Peanuts should be planted in

warm, moist soils. Planting peanuts in cool, wet soils, or planting seed too deeply or too early, may result in slow seed germination and seedling emergence. These factors contribute to seedling diseases and poor stands, and may influence replanting decisions.

The number of days between the optimum temperature for germination and the first killing frost should be considered when selecting the peanut variety. Valencia varieties require only 95 to 100 days to reach maturity, while some of the Virginia, Spanish, and runner market types need 140 days or more. Optimum planting date is generally determined by soil temperatures above 60°F for five or more days in succession.

IRRIGATION AND WATER USE

Water requirements of peanuts vary during the season. Daily water use is typically low early in the season, peaks during mid-season, and decreases again at crop maturity.

A peanut crop's water demand depends on the growth stage of individual plants. During seedling development, root growth can reach a 1-foot depth in 11 days. By this time, taproots and lateral roots are well developed, but only four leaves will have developed on the plant's main stem.

During vegetative growth, flowering, and pod development, water availability is important. Too much rainfall or irrigation can promote vegetative growth at the expense of reproductive growth. By contrast, the ratio of pods to vegetation is not increased by prolonged drought.

Peak daily water use by peanuts varies from 0.20 to 0.30 inch per day, with an average of about 0.25 inch per day. On extremely hot, dry days, water use can increase to 0.40 inch per day. On such days, even plants growing in a soil profile full of water may wilt during the afternoon. This is temporary wilt that should disappear during the night. The plant's protective mechanism causes the peanut plant to conserve moisture. There is little yield reduction with temporary wilt.

Peanuts use between 20 and 30 inches of water during the growing season. Average rainfall during the growing season, April 1 to October 1, in Roosevelt County is 11.84 inches, leaving a deficit of 8.16 to 18.16 inches that must be provided by irrigation.

All peanut irrigation systems should be able to meet the water needs of the crop over the entire field and should be able to apply water at a rate that does not exceed the soil's infiltration capacity. Uniform water distribution is necessary because the soils in which peanuts are grown have a relatively low water-holding capacity. Irrigation should fill the water holding capacity of the soils, even in sandy and sandy loam soils. Frequent light irrigation in low-water-holding-capacity soils can increase field humidity and promote foliar disease problems.

Too much water, especially in late season and during pod maturation, promotes soil-borne diseases, leaches certain nutrients required for proper pod development and production, and can cause some maturing kernels to germinate, reducing the percentage of sound mature kernels at harvest.

SOIL INOCULANTS

Soil inoculants of viable rhizobia microorganisms seldom have been shown to increase crop yields in New Mexico soils. Peanut rhizobia microorganisms are abundant in the soils of New Mexico's major peanut-producing areas and, at current yields and nitrogen fertilization rates, are able to fix adequate nitrogen in the peanut plants.

Rhizobia strains of soil inoculant are available to help improve nitrogen uptake by the peanut plant where new soils are brought into production.

WEEDS AND THEIR CONTROL

Peanut producers in eastern New Mexico must contend with a diverse collection of weeds, from annuals to perennials, and from grasses to broadleafs. They may be tall or prostrate weeds. They may be highly competitive or only slightly competitive.

Selecting the correct herbicides and using these herbicides in a way that prevents injury to the peanut plant is important to the producer.

There are four basic classes of herbicides to control weeds in peanuts. These include pre-plant, pre-emergence, ground-cracking, and post-emergence herbicides. Pre-plant herbicides are the most commonly used herbicides in eastern New Mexico. Pre-emergence and ground-cracking herbicides are the next most popular choices. Most peanut producers in the eastern New Mexico region use post-emergence herbicides only to control problem weeds not effectively controlled by other herbicide applications.

Table 2 lists common herbicides registered for use on peanuts in New Mexico. The time of application and the weeds they are effective against also are included. The producer should know what weeds the herbicide is designed to kill, and what weeds are a problem in the field.

DISEASE AND OTHER PESTS AND THEIR CONTROL

The Valencia peanut is susceptible to a number of foliage, pod, and root diseases. Each producer must develop a disease control plan, preferably for each field from past disease and crop records. Recognition of potential disease development plays an important role in the use of effective control measures. Plant diseases are seldom unique to a specific host crop. Knowledge of previous crops and diseases in a field can alert a producer to potential problems.

Certain peanut diseases can greatly reduce both quality and yield. Most of these specific diseases can be controlled by using good sanitation practices and cultural practices that lead to vigorous plant growth.

- Employ good crop rotation practices. Small grains are the best crops to precede peanuts except where crown rot has been a problem. Cotton is a poor crop with which to rotate peanuts. Peanuts should not follow potatoes or other vegetable crops in which diseases common to peanuts have been present. Heavy soils with high clay content should not be planted to peanuts for more than two consecutive years.
- Shortly after harvest, turn under as much of the crop residue as practical.
- Test soil for nematodes, and treat with a nematicide if a problem exists.
- Obtain a soil analysis and fertilize accordingly. Apply foliar iron chelate or iron sulfate in areas with a history of iron chlorosis.
- Prepare a seed bed free of crop residue and large clods.
- Avoid early plantings in cold soils.
- Use high-quality seed with good germination tests. Treat seed with a recommended fungicide.
- Plant seed at a uniform depth and avoid deep placement of seed.
- Irrigate when necessary to ensure the deep roots of the plant are exposed to adequate water.
- Flat cultivate so soil and trash are not pulled toward the plants.
- Harvest should be timed to achieve a 70%(+) sound mature kernel score. Overmaturation can result in decreased yields, as pod stem strength deteriorates upon pod maturity.

Seedling Diseases

Several fungal organisms can attack the seed or young seedlings. Stand reduction is the most obvious field symptom of seedling diseases. Plants may become diseased soon after germination and never emerge from the soil, or they may die any time during the early growing season. Symptoms of seedling diseases vary because of different causal organisms, cultural practices, and climatic conditions.

When the fungus *Aspergillus niger* is involved in seedling loss, a young stand can appear healthy,

Table 2. Weed control (herbicides)

Product*	Rate per treated acre	Time of application	Weeds controlled
Alachlor Lasso (4EC) (chloroacet-amide)	3-4 lb. ai./A (3-4 qt. 4EC/A)	Pre-plant; pre-emergence surface	Annual broadleafs & annual grasses. Incorporation must be ABOVE seed. Use under sprinkler irrigation most effective.
Basagran (bentazon)	0.5-1 lb. ai/A (1-2 pt./A)	Early Post-emergence	Broadleafs including annual morning-glory, ragweed; sedges: yellow nutsedge
Blazer (acifluorfen)	0.125-0.375 lb. ai/A (0.5-1.5 pt./A)	Post-emergence	Annual broadleafs including pigweed, morning-glory, ragweed, bindweed. Annual grasses including Johnsongrass & volunteer small grains
Cadre (imazameth)	3-4 oz./A	Early post-emergence	Annual broadleafs, spurred anoda, pigweed, morning-glory; grasses & sedges: Johnsongrass, yellow nutsedge
2,4-DB (phenoxy-herbicide) various formulations	0.23-0.4 lb. ai/A (0.9-1.6 pt. 200/A)	Post-emergence	Annual broadleaf weeds, morning-glory, cocklebur
Dual (chloroacet-amide)	1.5-3 lb. ai/A (1.5-3 pt. 8E) (2.25-5.4 lb. DF) (6-12 lb. 25G)	Preplant incorporated. Pre-emergence. Post-emergence	Broadleafs including pigweed; grasses and sedges; yellow nutsedge
Glyphosphate (Roundup)	0.25-1.5 lb. ai/A (0.25-1.5 qt./A) Perennial weeds: 2-5 lb. ai/A (2-5 qts./A)	Pre-emergence or spot treatment	Emerged annual and perennial broadleaf weeds and grasses
Paraquat	0.125-0.25 lb. ai/A (11-22 fl. oz./A)	Post-emergence from ground crack to 28 days post cracking.	Contact herbicide used to control or surpress a broad spectrum of emerged weeds. Restricted use pesticide.
Poast Plus (sethoxydim)	0.14-0.28 lb. ai/A (1.5-2.2pt./A)	Post-emergence	Annual & perennial grasses. No activity on broadleafs or nutsedge
Prowl (dinitro-aniline)	0.5-1 lb. ai/A (1.2- 2.4 pt./A)	Pre-plant incorporated	Controls broadleafs including kochia and pigweed, and grasses
Pursuit (imida-zolinone)	0.063 lb. ai/A (4 oz. 2AS/A or 1.44 oz. DG/A)	Pre-plant, pre-emergence, post-emergence	Wide range broadleaf control; grasses including Johnsongrass and nutsedges.
Sonalan (ethal Furalin)	0.5-1.1 lb. ai/A (1.5-3 pt. HFP/A) (1.44 oz.DG/A)	Pre-plant incorporated	Broadleafs, including kochia, pigweed, Russian thistle; grasses
Storm (Premix) (bentazon & aciflourfen)	0.75 lb. ai/A (1.5 pt./A)	Post-emergence	Broadleafs: morning-glory, ragweed, pigweed, spurred anoda, cocklebur.
Tough (pyridate)	0.47-0.94 lb. ai/A (1-2 pt. EC/A)	Post-emergence	Broadleafs: kochia, pigweed, Russian thistle, nightshade suppression; sedges: nutsedge
Vernam (vernolate)	2-2.5 lb. ai/A (2.33-3 pt./A)	Pre-plant	Broadleafs: morning-glory, ragweed, pigweed, spurred anoda, cocklebur.

* Consult label for restricted entry interval and protective clothing requirements.

then plants wilt suddenly. Wilting plants may show signs of stunted growth when compared to uninfected plants. Large skips frequently occur in parts of the field where plants are infected. Characteristically, crown tissue and roots become rotted and shredded in appearance. Black spore masses may be present in these diseased areas.

Damping-off, caused by *Rhizoctonia solani,* is a seedling disease that causes sunken cankers at or near ground level. The cankers weaken the developing stem to the point of collapse. When *Pythium myriotylum* is involved in damping-off, seedling disease is characterized by wilting. Infected small plants may topple over at the ground line. Examination displays rotting plant and stem tissue at the ground line.

Several factors may contribute to seedling disease: use of damaged or broken seed, planting too deeply, uneven planting depth, dry spots in the field, planting too early in cool soil, and poor crop rotation sequences. Seedling diseases can be reduced considerably by planting fungicide-treated seed and by using good cultural practices. Seed should be treated with a fungicide or fungicide combination following label directions. Some producers have found furrow sprays or granules of Terraclor Super X®, and Ridomil® applied at planting are helpful where known problems with seedling diseases exist. (Note: Terraclor controls *Rhizoctonia* spp. and Ridomil controls *Pythium* spp.)

Blackhull

As its name indicates, the blackhull disease causes dark discolored areas on the peanut hull. These discolored areas may be large or small and may discolor the whole surface of the hull or appear as black speckled areas. In severe cases, discoloration extends into the kernels. Peanuts with high percentages of discolored hulls are sold at a discount. Use of recommended cultural practices such as rotation offer the best means of control.

The only fungicide currently labeled for control of blackhull is Benlate. Label recommendation is at the rate of 3 lb/A of Benlate (in sufficient water to facilitate) application or in the furrow at planting. Do not graze or feed treated vines, hay, or hulls to livestock.

Not all hull discoloration is caused by *Thielaviopsis basicola*, the blackhull organism. Some non-pathogenic (saprophytic) fungi may grow on the surface of the hulls causing discoloration. This is especially true in wet harvest years. Treatment with broad-spectrum fungicides is usually not possible when late-season saprophytic fungi cause discoloration problems, because most fungicides have label-defined application times prior to harvest that prevent their use.

Conditions often associated with blackhull disease are:

- Low temperatures late in the season.
- Heavy textured, alkaline soils.
- Cool, damp soils with poor drainage.
- High population of the blackhull fungus, *Thielaviopsis basicola,* in the soil.
- Peanuts following cotton or peanuts.
- Delayed harvest.

Verticillium and *Fusarium* Wilt

Verticillium and *Fusarium* diseases are caused by soil-borne fungi that enter plants through the roots. They cause problems to the plant by growing in the water-conducting xylem tissue, causing it to become plugged. *Verticillium* wilt is a major problem in cotton and has been found in potatoes; *Fusarium* more commonly appears in vegetable crops. Once a field has become infected with either *Fusarium* or *Verticillium,* the infectious spores remain present for years. Crop rotation practices do little to reduce the number of infective spores. Consequently, infected fields may not be useful for peanut production in future years. There are no available fungicides that adequately treat infected plants for either of these diseases, or reduce the number of spores present in soil.

Symptoms for both diseases include stunting and yellow leaves that wither and drop early, or wilting lateral growth. Characteristically, the central main stem often remains healthy in appearance. If wilting plants appear randomly scattered throughout the field, suspect *Verticillium* or *Fusarium* wilts. Dark brown discoloration in the

woody portion of the stem and the upper root portion of the plant helps to confirm the diagnosis of these wilts. Loss can be kept at a minimum if the disease or cultivation history of a field is known, and peanuts are not planted following cotton or vegetable plants including potatoes in crop rotation.

Iron Deficiency (Chlorosis)

Chlorosis is the lack of chlorophyll in plants. The entire leaf may be white, or the veins may be green, while the areas between the veins may be white or light green. Severe chlorosis causes stunting. Chlorosis can be caused by a lack of available iron from soils. Uptake of adequate balanced nutrients during periods of rapid growth after rainfall or heavy irrigation, causes temporary chlorotic conditions not to be confused with unavailability of soil iron. Foliar-applied iron chelates or sulfates will correct iron chlorosis. Follow label directions.

Leaf Spot Diseases

Rainfall or irrigation followed by high humidity during the growing season can contribute to Cercospora leaf spot (*Cercospora* sp.) and web blotch (*Phoma* spp.). These fungi are present to some extent in most locations from year to year, but are most troublesome during wet, humid years. Cercospora causes brown-to-black, circular-to-irregular spots on the leaflets, petioles, and stems. The spots are frequently surrounded by a yellow halo. Web blotch causes brown areas on leaves that have distinct webbing or netting patterns.

Leaf diseases can be controlled by applying fungicides when excessive moisture and humidity occur during the growing season. Fungicide applications should begin before leaf spots become established. Most products do not claim to eradicate existing infections, but rather work to prevent infection. In order to prevent or delay the development of resistance by the organisms, two or more types of fungicide should be applied. However, take care not to alternate applications of two different fungicide types. Doing so may prevent buildup of protective residues from either fungicide type and leave plants unprotected. Pre-mixed formulations of fungicides that work together are sold specifically for this purpose.

Fungicides used to control foliar diseases should usually be applied before infectious spores settle on leaf surfaces, and continued according to product labels. Chemigation, aerial, and spray-coupe application have all been successfully used. As plants mature, their canopy may prevent lower leaves from being adequately treated, so use application techniques that allow greater penetration of the plant canopy. Current control efforts focus on an environmental monitoring program established throughout the peanut production area.

The “Blotchcast” software program (developed for Roosevelt County, New Mexico), assists producers by recommending fungicide application times for controlling web blotch. Electronic environmental monitors linked to computers by digital radio communication provide data used by computers to forecast favorable conditions for growth of the web blotch fungus. Throughout the growing season, announcements are made when favorable conditions occur. The most commonly used web blotch control fungicide is Bravo®.

Southern Blight (also known as stem rot)

Southern blight (*Sclerotium rolfsii*) is a fungal disease that may be prevalent in some fields. It is usually recognizable by thin, sinuous, white fungal filaments (hyphae) on the base of plant stems and nearby surrounding soil. Small white dots called sclerotia accompany the hyphae. Sclerotia, which turn tan to brown with age, serve as overwintering bodies for fungus spores. Peanut stems, pegs, and pods can all be affected. Cool, moist weather is required for southern blight, which usually appears during fall or late summer. Plants wilt and die when they are girdled by the fungus, but it is common to find some surviving branches on each affected plant. Typically, this fungus spreads from infected plants to adjacent ones, so visual examination of an infected field may show small patches or areas of wilting or dying plants. Heavy applications of gypsum, sulfur, or use of other fungicides that reach the soil may prevent southern blight from developing on soil surfaces.

Under these circumstances, symptomatic plant wilting and death may not occur and the plants may appear healthy upon visual examination of the field. However, the fungus can still attack developing and mature pods beneath the ground. Producers are cautioned to occasionally pull plants, especially in low areas of the fields where moisture accumulates, and examine them for subterranean infestations. Affected pods are tan to light brown, often covered with white mycelia, and at maturity are usually completely rotted and unharvestable.

Control methods for this disease include deep covering of crop residue, flat cultivation to avoid pulling soil and trash toward the plants, crop rotation with grain sorghum to reduce the numbers of infectious spores, and use of soil fungicides specific for control of this pathogen. Numerous fungicides are registered for southern blight control; many contain PCNB as the active ingredient.

Preventing foliar diseases also is important in controlling southern blight. Foliar diseases often cause leaves of the peanut plant to abscise. Dead leaf tissue on the soil surface provides decaying organic matter for southern blight organism to begin growing.

Pod Rots

Pythium myriotylum, *Rhizoctonia solani*, and *Sclerotium rolfsii* (table 3) are all capable of causing pod rots. When pod rots occur, more than one fungus may be associated with the rotted conditions.

Pythium spp. causes a wet pod rot, which provides a characteristic symptom of its infection. *Pythium* spp. are water molds and when infected pods are squeezed a wet pulpy condition is present inside the developing pod. Left to maturity, these pods will completely rot and the pods will be lost from harvest. If a heavy disease condition is observed in the field and loss is judged to be significant, use of Ridomil® will help to arrest the condition and prevent further infection.

Rhizoctonia solani infects developing pods and may penetrate pods to rot the kernels inside. *Rhizoctonia* most commonly causes ulcers and canker-like indentations on the pod, and pod discoloration. Pods are predisposed to infection after damage by wireworms. Once the pod has been penetrated, *Rhizoctonia* gains simple entrance to the kernels inside and begins to destroy them. Empty, rotted, light-weighted pods often blow out during harvest, while partially destroyed kernels increase concealed damage at grading. *Rhizoctonia*, or "Rhizoc" as it is commonly called, can be treated with PCNB-containing fungicides, as it does not respond to Ridomil®.

Pod rot caused by *Sclerotium rolfsii* (southern blight) can be devastating if an entire field becomes infected. Usually, however, southern blight only infects small areas. As with any fungicide, the degree of infection and potential loss must be weighed against the cost of treatment.

Pod rots do not exhibit noticeable above ground symptoms, therefore occasional pulling of plants throughout the field, especially during pod maturation, is important. It is the only way pod rots can be detected. Healthy vines do not automatically predict healthy pods and peanuts below the soil. Proper treatment, if required, must begin early enough so as to not exceed label application restrictions regarding the number of days before harvest.

Table 3. Guide for distinguishing pod rots.

Item	Pythium spp.	Rhizoctonia spp.	Sclerotium spp.
Pod color	Dark brown to black	Dark brown to black	Tan to light brown
Moisture level of affected pods	Water when squeezed	Dry	Moist and slimy but not watery
Most favorable soil moisture levels	Too wet	Normal	Normal to dry
Controlled by PCNB (Terraclor)	NO	YES	YES
Controlled by Ridomi	YES	NO	NO

Sclerotinia Blight

Sclerotinia blight is not currently a problem for peanut producers of eastern New Mexico. The Valencia peanut and the soils of the region, however, are not immune to infection by this pathogen. Constant quarantine practices are advised. Any used peanut-production equipment, purchased where this pathogen exists outside of the Valencia peanut-growing area, should undergo thorough cleaning and washing prior to entering New Mexico. It is highly advised to only use seed grown and produced within the eastern New Mexico growing region. Once this pathogen enters New Mexico, it can easily spread to most peanut-producing fields, and its treatment and prevention with fungicides will greatly reduce the economic gain from peanut crops. Sclerotinia blight is in most adjacent peanut-growing regions, including parts of Oklahoma and Texas.

Nematodes

Plant parasitic nematodes are microscopic worms that live in the soil and infect plants. Two varieties, root-knot and root-lesion nematodes, are known to cause problems in New Mexico. Typically only small areas of fields are affected, but widespread infections can destroy a crop.

Root-knot nematodes cause gall formations on peanut roots, pegs, and pods. Plants severely affected by root-knot nematodes are stunted and may be lighter in color. During field inspection, healthy, normal-sized plants provide a marked contrast to dwarfed and stunted ones affected by nematodes. Small areas within a field are generally involved and plants of different heights are common within the area. Take care to observe and treat infected areas so the organisms are not spread throughout the field during normal yearly field preparation and cultivation. Numbers of root-knot nematodes can be reduced by rotating small grains with peanut crops.

Root-lesion nematodes affect roots, pegs, and pods, and can best be identified by the presence of small spots on pods. These spots are tan with a dark center. Root-lesion nematodes have a wide range of host plants and therefore cannot be controlled by crop rotation where nematode populations are high. Nematicides can be used to control both root-lesion and root-knot nematodes.

Insects

Insects are not usually a major problem for peanut producers in eastern New Mexico. Control of thrips in peanuts is believed to assist the early development of plants, but research has demonstrated little economic improvement from their management. Army worms are an occasional problem in some areas. The moths, active at night, are dark gray with a noticeable whitish spot near the extreme tip of the wings. The larvae feed day and night. Larvae color ranges from dark tan to green to nearly black and they have three yellowish-white lines down their back. Some peanut fields adjacent to grassland are occasionally damaged by grasshoppers. Both army worms and grasshoppers are easily controlled by labeled insecticides.

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