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# Production of Virginia Peanuts in the Rolling Plains and Southern High Plains of Texas

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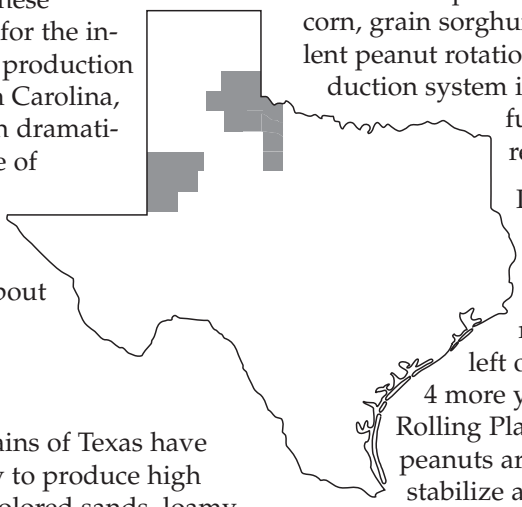
Four market-types of peanuts are grown in the United States—Runner, Spanish, Virginia and Valencia. Each type has different end-use qualities and manufacturer applications. Unlike other peanut producing states, the soils, irrigation and climate in Texas are conducive for the production of all four market-types.

Virginias have the largest kernels and account for most of the peanuts roasted and eaten in-shell. Virginia peanuts are sold widely at sporting events and are known as "ball park" peanuts. They are also sold shelled as salted peanuts. These peanuts are primarily produced for the in-shell, export market. Traditional production areas include Virginia and North Carolina, but production in Texas has risen dramatically in the past 10 years because of increased contracting. In 1994, Texas growers harvested 27,300 acres of Virginias in 21 counties, producing an average yield of about 3,000 pounds per acre.



## Site Selection

The South Plains and Rolling Plains of Texas have the soils and irrigation necessary to produce high quality Virginia peanuts. Light colored sands, loamy sands and sandy loams with low clay content are best. The large pods are more easily extracted from loose, friable, sandy soils. In higher clay content soils, a large percentage of pods may be left in the soil during the digging operation.Because they are produced for an in-shell market, hulls must be bright colored and free from stains and blemishes that heavier soils might cause.

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## Crop Rotation

Crop rotation is the key to profitable peanut production, especially with Virginias. They should be planted in the same field only 1 year out of 3 or, in the best case, 1 year out of 4. The advantages of crop rotation are numerous; primarily they include improved soil fertility, reduced disease and nematode problems and more manageable weed control systems.

In west Texas, cotton is the best alternative crop for a stable and profitable peanut rotation, although corn, grain sorghum and small grains also are excellent peanut rotation crops. The cotton/peanut production system is the cornerstone for maintaining future peanut production in the region.

Producers should avoid following peanuts with peanuts, but where this has occurred, another crop always should be planted the next year and peanuts should be left out of the rotation for at least 3 to 4 more years. Field research in the Rolling Plains has shown that where peanuts are planted continuously, yields stabilize at about 2,500 pounds per acre; diseases such as pod rots, southern blight and sclerotinia blight proliferate; and production costs increase. With proper rotations and good in-season management, yields of 4,000 pounds per acre or more are attainable. In the absence of rotation, peanuts will not be a viable crop for the region.

## Soil Fertility and Plant Nutrition

Peanuts will not produce high yields when soil fertility is low, and they do not respond to direct fertilization. A uniform, high fertility level must be developed throughout the root zone. This is best

accomplished by fertilizing previous crops. If a soil test indicates the need for fertilizer, it is best to apply it before preparing the land. The primary tillage operations will distribute the fertilizer throughout the root zone.

## Soil pH

In west Texas, low soil pH is seldom encountered; therefore, the use of agricultural lime is rarely, if ever, recommended. High pH soils (7.0 and above) are normal for the region and can cause some nutritional deficiencies in peanuts.

## Nitrogen, Phosphorus and Potassium

One of the major benefits of producing peanuts, or any legume, is that they require little nitrogen fertilizer. Peanuts have the ability to enter into a symbiotic relationship with *Rhizobium* bacteria—the *Rhizobium* obtains its nutrition from the plant and the plant gains usable nitrogen from the bacteria. This is known as the nitrogen fixation process. With proper seed inoculation, the peanut plant requires little supplemental nitrogen fertilizer and direct applications of large amounts of nitrogen are generally not recommended. Research in Gaines and Haskell counties from 1990 to 1993 did not indicate any yield or grade benefits from nitrogen fertilization at rates up to 200 pounds of nitrogen per acre. However, the higher the soil pH becomes, the less effective nitrogen fixation is.

For the most efficient use of phosphorus (phosphate) and potassium (potash) fertilizers, apply them to the previous crop or before land preparation, and thoroughly incorporate them into the root zone. Always follow soil test recommendations to avoid over- or under-fertilizing the crop. This is especially important for potassium, because high levels in the pegging zone have been found to interfere with calcium uptake and to increase the incidence of pod rotting organisms such as *Pythium* and *Rhizoctonia.* If you have any questions about soil testing, consult your county Extension agent-agriculture.

## Calcium

In Virginia peanut production, calcium is by far the most critical nutrient for achieving high yields and grades. Low levels of calcium cause several serious production problems, including unfilled pods (pops), darkened plumules in the seed and poor germination. In fields low in calcium and high in sodium, a condition called “pod rot” is common. Supplying gypsum can help.

Calcium must be available for both vegetative and pod development. Calcium moves upward in the plant in the xylem conducting tissues. It does not move downward in the phloem. Therefore, calcium is not transported from leaves to pegs and to the developing pods. Pegs and pods absorb calcium directly from the soil, so it must be readily available in the pegging zone. Foliar applied calcium treatments **DO NOT** correct calcium deficiencies.

On high pH soils, calcium fertilization is accomplished with agricultural gypsum ($CaSO_4$). Calcium contained in gypsum is relatively water soluble and can be taken up by pegs and developing pods. Experience in Texas indicates that a soil test level of 600 ppm calcium is adequate for Virginia peanut production. If soil calcium levels are less than 600 ppm, or if irrigation water or soil is saline, gypsum applications may be needed.

Gypsum should not be applied during land preparation or before planting because it can be leached below the pegging zone. Best results have been obtained when gypsum is applied at initial flowering (normally 30 to 40 days after emergence). Banded applications over the row (12- to 16-inch band) of 600 pounds of gypsum per acre, or broadcast applications of 1,500 pounds of gypsum per acre, have proven to be adequate for Virginia production. Rainfall or irrigation after application is needed to move the gypsum into the pod development zone (upper 2 to 3 inches of soil).

## Micronutrients

Micronutrients include zinc, iron, manganese, copper, boron and molybdenum. Iron, zinc and copper deficiencies have been observed in west Texas.

### Iron

Iron chlorosis problems are most often observed on high pH soils and in fields that have high calcium carbonate levels. Symptoms will be seen on the youngest leaflets, which become pale green and develop an interveinal chlorosis. Iron chlorosis can develop 1 to 2 weeks following emergence. Generally, soil applications of iron fertilizer are ineffective and costly. Instead, foliar spray treatments of iron sulfate or similar materials should be made soon after emergence if symptoms are observed. Applications may need to be repeated at 10-day intervals if symptoms are severe.

### Copper

Copper deficiencies have been observed in the Rolling Plains, and are often mistaken for other problems. Initial symptoms include wilting of upper leaves, followed by chlorosis and leaf scorching. Dead, brown tissue develops from the leaf margins and progresses inward until the petiole drops. Yields can be significantly reduced. Soil applications of copper are the preferred method for managing deficient fields. However, foliar spray treatments of copper sulfate or similar copper-containing materials applied at early-bloom correct problem fields. Foliar fungicides containing copper also may correct the problem.

### Zinc

Zinc availability is reduced when soil pH is high. Deficiency symptoms include interveinal chlorosis of the youngest leaflets and, in severe situations, stunted plants and slow development of new leaves. Soil and foliar applications of zinc fertilizers should correct problem fields; however, soil applications are preferable.

## Irrigation and Water Use

Irrigation is the key to current and future peanut production in west Texas. Irrigation ensures a stable supply of high yielding, good quality, aflatoxin-free peanuts. The total seasonal water requirement for maximum peanut yields is approximately 20 to 28 inches. This will vary from year to year based upon temperature, humidity and wind. In semiarid west Texas, high temperatures and low humidity coupled with windy conditions contribute to high water consumption.

The growing season for peanuts can be divided into three distinct phases—pre-bloom/bloom, pegging/pod set and kernel fill/maturity. Water use varies along with these developmental stages. Water use is low in the early season, high during the reproductive period, and declines as pods begin to mature.

Water stress during the bloom period can delay formation of flowers or, under extreme conditions, completely inhibit flowering. After bloom, peg penetration into the soil requires adequate moisture. Once active pegging and pod formation have begun, the pegging zone should be kept moist with additional water even if adequate moisture is present in the soil profile. There are several reasons for this. A moist pegging zone facilitates the uptake of calcium by the pods. Failure of pegs to penetrate the soil can result from low relative humidity and high soil temperatures. Both of these climatic conditions are common to west Texas.

## In-Season Irrigation Management

Because of the shorter growing season and risk of late-season freeze damage in west Texas, peanuts should be planted in early-May in order to accumulate the heat units required for production of a mature crop. Peanuts planted within this time-frame need about 0.75 inch of water applied twice a week during the bloom stage, especially between early-July and late-August. This time period coincides with peak bloom. Water applied before early-July should be sufficient to fill or completely maintain moisture in the soil profile.

If 0.75 inch of water is applied twice per week, this will not supply as much water as the plant actually uses. Consequently, stored water at the 2- to 3-foot depth will be used by the plants. During August, transpiration and evaporation will often range between 0.25 and 0.35 inch per day, depending on weather conditions. This amounts to 1.75 to 2.45 inches of water per week. Therefore, the two 0.75-inch applications each week must be supplemented by a full profile of water at the beginning of the season.

Uniform moisture that can be maintained with two irrigation applications per week helps to ensure adequate soil moisture and high relative humidity in the canopy. The peanut plant flowers in response to elevated humidity, and pod set is enhanced by elevated humidity and moist surface soils. Consequently, high humidity during the critical 45 to 90 days after emergence will promote early maturity and increase yield. With early harvest, peanuts also are less exposed to pod-rotting diseases.

After pods are set, usually by late August or possibly even earlier, irrigation can be reduced to once per week. It is important to deplete the soil profile of moisture below the 1-foot level by late August to be prepared for high rainfall that may occur in early fall. If deep moisture is not depleted, heavy rains can waterlog the soil during the pod maturity phase. This is when the plant is most susceptible to pod rot organisms.

## Disease Management

Virginia peanuts are very susceptible to all the foliage and soil-borne diseases that affect other peanut types. Rotating peanuts with non-legume crops is the best disease control technique growers can use. The dry climate of west Texas usually prevents severe foliage disease problems, but there can be periods of high humidity even in this region. When they occur, the use of an approved foliar fungicide is advisable.

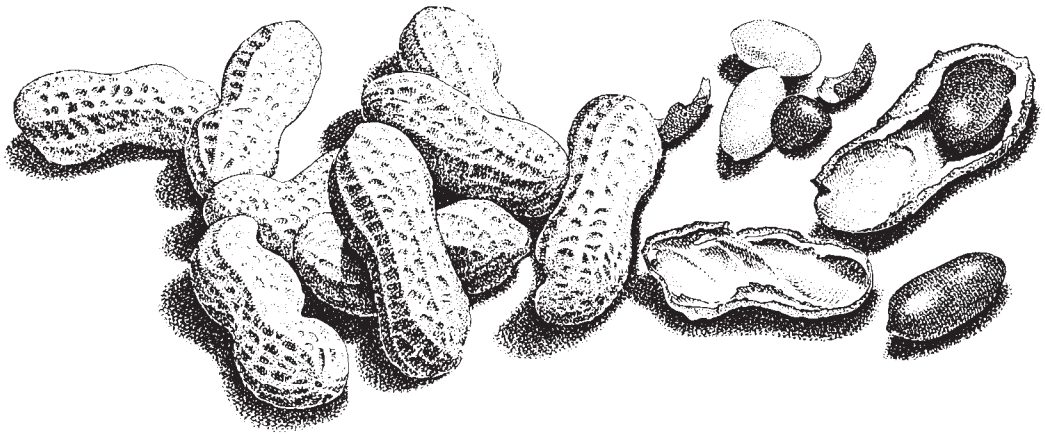
The most prevalent peanut disease in this area is caused by a strain of the fungus *Rhizoctonia*. Now that the fungicides Tilt® and Folicur® are labeled for peanuts, this disease is much easier to control. These fungicides also aid in the control of several less important soil diseases. Fields that sometimes receive excess moisture may develop a type of *Pythium* pod rot that responds to the fungicide Ridomil®.

Sclerotinia blight is a serious problem in certain fields in the Rolling Plains. Adequate chemical control for this disease is not available. Crop rotation in combination with good water management is the best management approach.

Cotton root rot can be a problem in certain fields in the Rolling Plains, and it does not respond to chemical control. Rotating peanuts with grass crops will significantly reduce the problem. Cotton should not be planted in infested fields.

Aflatoxin caused by the fungus *Aspergillus flavus* can be a problem where peanuts are severely stressed late in the season. Since all Virginia peanuts are produced under irrigation in west Texas, aflatoxin should not be a significant concern unless there is a breakdown in the irrigation system. Another factor influencing aflatoxin contamination is physical damage to pods. Damage from nematodes and pod-feeding insects such as the southern corn rootworm, and cracks caused by harvesting, make peanuts susceptible to *Aspergillus flavus*.

Virginia peanuts can be both enjoyable and profitable to grow if given the special attention they require.





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