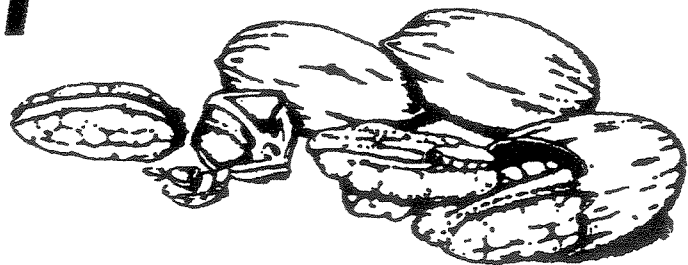


Texas Agricultural Extension Service
The Texas A&M University System

GC-101

Pecan Production Guidelines for Galveston County



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GROWING PECANS IN GALVESTON COUNTY

Pecans are native to Texas and grow extremely well in Galveston County. With good soil management, they make excellent yard trees. With good soil and adequate irrigation water, the pecan is also a good part-time or commercial crop.

This publication will serve as a basic guide for growing pecans in Galveston County for home owners and orchard operations. Success or failure with pecans in Galveston County will depend on soil, water, and the type of management the trees receive. Beautiful productive pecan trees are no accident. They will need to be the proper variety, have adequate space, irrigation, frequent zinc sprays, fertilization, weed control, and pest management.

VARIETY SELECTION

Choosing the right variety will be a very important decision. There are 50 varieties being planted throughout the pecan industry. There are 20 varieties which are popular in various parts of Texas. The varieties which are best adapted to Galveston County need to be productive, high quality, scab resistant, and have a strong tree. The following varieties are in the priority of performance and are recommended for Galveston County.

DESIRABLE.....Protandrous.....39.25nuts/pound.....53.88% Kernel

A very large, medium-percent kernel pecan with very good kernel quality. The Desirable has good disease resistance. It is a regular producer, seldom producing massive crops which exhaust the tree and bring on alternate bearing. Desirable takes approximately 9 years to come into production. Young trees under forced rapid growth will break when subjected to heavy rain and high winds. Desirable is the leading commercial variety being planted in humid areas. It cannot be grown in the arid west.

CHOCTAW.....Protogynous.....37.67 nuts/pound.....59.08% Kernel

A very large, high-percent kernel pecan of excellent kernel quality. The trees are productive and come into production in approximately 8 years. The tree is vigorous and disease resistant. A small percentage of Choctaw nuts can split in years when dry days are followed by extremely wet evening. Choctaw pecans have obtained premium prices at the retail level in recent years.

CHEYENNE.....Protandrous.....51.18 nuts/pound.....57.66% Kernel

A medium-size, high-percent kernel pecan of very good kernel quality. The tree is moderately vigorous with very diffused branching. The limbs are relatively thin, but strong. The young tree is not large. The Cheyenne is very productive and comes into production at a very early age. Cheyenne makes an excellent pollinator for Wichita. Cheyenne has good disease resistance and can be grown in humid areas.

KIOWA.....Protogynous.....39.35 nuts/pound.....56.90% Kernel

A very large, high-percent kernel pecan of good quality. The nut resembles the Desirable in appearance. The Kiowa variety has good foliage that is relatively disease resistant. This variety has a good potential for producing nuts that can be readily sold on the premium in-shell market. It performs well in both arid and humid areas.

SHAWNEE.....Protogynous.....50.04 nuts/pound.....58.41% Kernel

A medium-size, high-percent kernel pecan of good kernel quality. It is very productive and requires 8 years to come into production. This variety demonstrated excellent scab resistance in South Central Texas in 1975 when all other varieties showed susceptibility. Shawnee ripens very early in the season. The tree is vigorous; however, the limbs produce few lateral shoots.

SOIL REQUIREMENTS

Pecans perform best in deep, well-drained soil. Soil oxygen is necessary for the absorption of nutrients and water by the tree roots. Pecans have a much more critical soil oxygen requirement than other

trees or plants. For these reasons, good soil drainage is essential. Pecans cannot be grown in soil which holds water and wet, poorly-drained areas must be avoided. The trees will have difficulty if there is not sufficient movement of water through the soil to allow the roots to come in contact with air spaces.

SPACING

Pecan trees should not be planted closer than 35 x 35 feet. This recommendation is as important for home owners as commercial producers. This large amount of space is essential for light penetration into the tree, water absorption by the roots, and air movement between the trees. When the trees are 12 to 15 years old, they should be thinned to 50' x 50', 35' x 70' or 70' x 70'.

HOW TO PLANT PECAN TREES

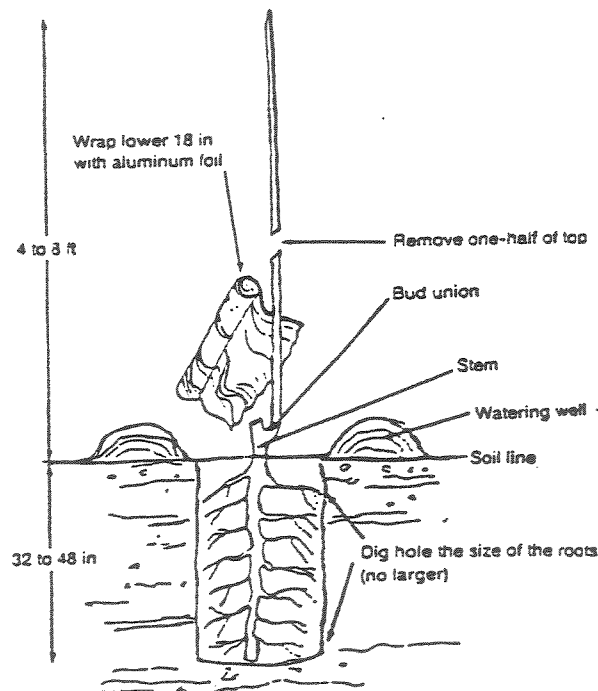
Pecan trees should be planted in December, January or February. In some cases, trees could be planted as late as March; however, earlier is better. The trees should be obtained as soon as possible to prevent the roots from drying out or freezing at the nursery.

Purchase trees which are 4 to 8 feet tall. Smaller trees are inferior and are not a good buy at any price. Trees larger than 8 feet tall are very difficult to transplant.

Keep the tree root system moist but not wet. Heel the root of a tree in with soil or hay if they cannot be planted immediately.

Dig the planting hole only as large as the root system. You do not need a very large hole. Plant the tree at the same depth it grew in the nursery row. Do not plant the tree at the bud union or turn in the trunk. The soil line is marked by a gray bark, brown root point on the stem. Place the original soil uncovered in digging the hole back into the hole when planting the tree. Do not use special soil or organic amendments like peat moss. This is especially true when planting trees in clay soil. Do not place chemical fertilizers in the hole during the planting.

Immediately after planting, cut the top back 1/3 to 1/2. Wrap the lower 18 inches of trunk with aluminum foil to prevent sunburn, rabbit damage, and herbicide damage.



YOUNG TREE TRAINING

The first 5 years of tree growth should be directed into one central leader and as much side shoot development as possible. All side shoots should be allowed to grow to a length of 12" to 24" each year. Do not let the shoots grow longer than this during any one season. The side shoots are commonly called a "trashy trunk" and they prevent sunburn, increase trunk girth, and manufacture food for the terminal growth of the central leader. The side shoots that develop in the lower 5' of trunk should be removed after they are 1 1/2" in diameter. No permanent limbs should be allowed to develop below 5'.

To maintain a central leader system, all "Y" crotches should be completely removed as they develop. A strong shoot will develop off the central leader if it is cut back 1/3 each January. If two shoots develop at the cut-back point, remove one as growth begins in April and May. The central leader cut-back pruning should be practiced only during the second and third dormant season.

Shoots developing above the 5-foot point on the trunk frequently develop "crows' feet"-type shoots. This is where 3 to 6 shoots develop from one point at the end of a limb. These shoots should be thinned out to only 3 shoots.

The permanent scaffold limbs should be 5 to 6 feet above the ground.

FERTILIZATION

Recommended annual fertilizer rates for pecans are based on these criteria:

1. Pecan trees need 1/3 lb. nitrogen (first number on fertilizer label) per inch of tree diameter.
2. No sod, weeds, or other growth should be within the drip line area.
3. The trees should be healthy and in good condition.

If the tree has sod growth under it (or is not in good condition), annual fertilizer rates should be between 1 1/2 to 2 times that noted on the chart.

Although more precise pecan tree fertilizer requirements can be determined by a soil analysis, the following chart contains information which should be helpful to you in determining your fertilizer needs.

FERTILIZER TYPE (NITROGEN %) (First number on fertilizer bag)

Tree Trunk Diameter	5%	10%	15%	21%	30%	33%	46%
1"	7#	3#	2#	2#	2#	1#	1#
2"	13	7	4	3	3	2	1
4"	26	13	9	6	5	4	3
6"	40	20	13	9	7	6	4
8"	53	26	18	13	9	8	6
10"	66	33	22	17	11	10	7
12"	79	40	26	20	13	12	9
14"	92	46	31	22	16	14	10
16"	106	53	36	25	18	16	12
18"	119	59	40	28	20	18	13
20"	132	66	44	31	22	20	14
24"	159	79	54	38	27	24	17
30"	199	100	67	48	34	30	22

To use the chart:

1. Determine your fertilizer nitrogen content.
Example: 16-20-0 fertilizer has 16% nitrogen.
2. Determine tree diameter (thickness) by measurement at about 12 inches from the ground.
3. Align tree trunk diameter (inches on the left) with type of fertilizer (nitrogen content) across the top, and note the pounds of that fertilizer to be applied to the tree annually. If the tree has sod or is in poor condition, then 1 1/2 to 2 times the amount on the chart should be applied annually.

Example: For a 14" pecan tree in good shape, with no sod and using 21-0-0 fertilizer, intersect 14" on left side of the chart with 21% on top of chart (from 21-0-0 fertilizer with 21% nitrogen) and read the annual fertilizer requirement as 22 lbs.

4. If the correct tree diameter is not noted on the chart, use nearest measurement.

The fertilizer should be uniformly spread within the drip line of the tree and watered in. One cup (the type used for food recipes) of most granular-type fertilizers equals 1/2 lbs. and 1 gallon equals 8 lbs.

WHEN TO FERTILIZE

January or February - Uniformly Apply 1/2 of recommended annual dosage within the drip line by broadcasting. Annual required dosage determined by Extension Service soil test. (See attached information and chart for approximate fertilizer.) Increase rate up to double for trees with sod or for non-producing or unhealthy trees.

June - See January/February information on application rate. Apply 1/2 the annual requirement.

IRRIGATION

Water is essential for good young tree growth and regular production of quality nuts on mature bearing trees. Either drip irrigation, sprinkler irrigation, and flood irrigation should be used to supplement rainfall as needed.

On young trees, small amounts of water should be applied as growth begins each year in the spring during periods of low rainfall. As growth continues, temperatures increase, and days become longer, the water requirement will also increase. The following is a guide:

Water Requirement Guide for Young Pecan Trees in Well-Drained Soil (Gallons of Water Needed Each Day)

<u>Tree Age</u>	<u>April & May</u>	<u>June</u>	<u>July & August</u>
1st Year	1 gallon	2 gallons	3 gallons
2nd Year	2 gallons	4 gallons	8 gallons
3rd Year	4 gallons	8 gallons	16 gallons
4th Year	8 gallons	16 gallons	32 gallons

These amounts may be applied daily or accumulated and applied once or twice a week. If the trees are not making strong growth, these rates should be reduced. If the trees are not growing, the rate should be cut back drastically. Watering should begin with growth in April and continue through August. The trees may need to be watered some in the winter months if prolonged drought conditions occur. Mature bearing trees need 1 inch of water per week from April to October. Trees should not go over 3 weeks without water during this period.

PECAN INSECTS, DISEASES AND ZINC ROSETTE

DISEASES:

The two most important pecan diseases in Galveston County are pecan scab and stem-end blight.

Pecan Scab is a fungus disease which forms lesions on the leaves and shucks. Black, sunken spots on the shucks are a typical symptom. During seasons of high relative humidity, pecan scab is a very serious problem. Fungicide sprays will be needed for each 100 hours of accumulated relative humidity above 90 percent.

Stem-End Blight is a fungus disease which is thought to enter the pecan nut at the water stage in late July. It is prevented or reduced with Benlate sprays at the water stage or nut development and 2 weeks later. Stem-End Blight is frequently not identified until after damage occurs. The symptoms are shedding in early August, large black areas on the shuck, no kernel development, and shuck sticking to the shell.

INSECTS:

Galveston County pecans are affected by at least three major insect pests. The most significant are the pecan nut casebearer, hickory shuckworms, and black aphids. Others include phylloxera, yellow aphid, leaf casebearer, walnut caterpillar, and others.

The pecan nut casebearer can destroy over 70% of the crop. Insecticide applications must be concisely timed within a 2-3-day period after the small larvae emerge from eggs which are located on the tip of the small nutlets. These eggs can usually be monitored in early May to determine when to spray. The predicted time to spray for the first generation of the pecan nut casebearer will be announced by the Galveston County Extension Agent in the local newspapers. Second generation casebearers can be expected 42 days after the first generation.

ZINC ROSETTE:

Pecans cannot be grown successfully in Galveston County without foliar zinc sprays. Soil tests will show adequate levels of zinc are present; however, the tree will not absorb it from the soil. Zinc rosette appears as short stunted shoot growth. The shoots tend to grow in bunches. Older trees will have dead shoots throughout the top of the tree. Young trees should be sprayed every 2 weeks from April to August for growth to continue through the season.

Bearing trees should be sprayed at bud break, pre-pollination, casebearer, and second generation casebearer to allow maximum shoot growth and leaf expansion. Two zinc products are effective - Zinc Sulfate or NZN. Zinc chelates are not effective.

WEED CONTROL

Weeds must be effectively controlled around young pecan trees for good tree growth. Spray with ROUNDUP post-emergence herbicide in April, June and September. Mix 2 tablespoons of ROUNDUP per gallon of water or 1½ quarts in 50 gallons of water per acre. The first year, tree trunks should be wrapped with aluminum foil to prevent herbicide damage.

On bearing trees in yards, the lawn should be closely mowed. Commercial orchards can be mowed or lightly disked to control weeds.

RECOMMENDED INSECTICIDES, FUNGICIDES AND ZINC

IMPORTANT: Use only ONE (1) EACH of the recommended insecticides, fungicides and zinc products listed below in preparing a spray mix. Insecticides, fungicides and zinc products are offered under a variety of brand names and the relative strength (that is, the percent active ingredient) may vary from one brand label to another. The "strength" of a particular pesticide as originally purchased in concentrated form has no effect on the control achieved, that is, 50% malathion is not more effective than 10% malathion—one will need to add more of a "lesser strength" insecticide to a spray preparation than a "higher strength" one. Therefore, refer to the manufacturer's directions for amounts to apply per gallon.

INSECTICIDES (Use only one of the following two insecticides in the spray mix):

Malathion OR Sevin

FUNGICIDES (Use only one fungicide in the spray mix):

Benomyl [Benlate] OR Thiophanate-Methyl - [Topsin-M] OR Triphenyltin Hydroxide [Duter, Super Tin, Triple Tin]

Topsin-M, Duter, Super Tin and Triple Tin are restricted use fungicides and are not suggested for use around the home due to drift problems on fruit and vegetable crops. In addition, they are available only in large commercial containers.

ZINC (Use only one of the following zinc formulations in the spray mix):

Zinc Sulfate - A powder (Garden hose applicator or garden sprayers are not recommended for use with zinc sulfate due to clogging.)

OR NZN - A liquid (Application by garden hose sprayers is generally satisfactory.)

OR ZN Special

Use of a Surfactant

Surfactant - Many commercial surfactants (a spreader/sticker liquid) are available. Equally effective. See individual label for concentration. These should be used with every spray application except dormant oil.

PECAN SPRAY SCHEDULE

January or February - Dormant or Winter Oil Spray

Spray all of trunk and limbs for wintering insect eggs and scale.

April 1 - Spray at Budbreak Stage

NOTE: Apply this spray within a few days after first bud emergence. Spray an insecticide, fungicide and zinc mixture on all stems and foliage. Following suggested insecticides, fungicides and zinc spray materials:

Benomyl or Thiophanate - Thiophanate-Methyl or Triphenyltin Hydroxide
(As listed on page 6)

PLUS

Malathion or Sevin - (As listed on page 6.)

April 15 - Spray at Pre-pollination Stage

Apply zinc/fungicide/insecticide spray mixture on all foliage the same as for April 1.

May 1-20 - Casebearer Spray (approximate dates)

Use the same spray mixture as for April 1 (budbreak spray) and April 15 (pre-pollination spray).

July 22 - Water-Stage (Control of aphids, foliage feeders, and stem-end blight.) Apply fungicide/insecticide spray mixture plus surfactant. **Do Not Use zinc after July 1.**

August 6 - Hickory Shuckworm Spray I

Apply fungicide/insecticide spray mixture **plus** surfactant as listed for July 22 (water-stage spray). Apply on foliage for all trees that are bearing pecans. If there are no pecans on the trees, it is not necessary to spray them past this point in the growing season.

August 20 - Hickory Shuckworm Spray II

Apply fungicide/insecticide spray mixture plus surfactant the same as for August 7.

September 3 - Hickory Shuckworm Spray III

Apply fungicide/insecticide spray mixture plus surfactant the same as for August 21.

IMPORTANT: DO NOT APPLY THIS SPRAY IF ANY SHUCKS ON THE PECANS ARE SPLIT

SPECIAL NEEDS AND CONCERNS

Additional or special needs may arise during the year.

Substitutes for application materials can certainly be made. The aforementioned recommended materials are considered the most effective on the market. With the above schedule, a minimum of material stock is needed by the individual. Certain special needs may require material or application substitutions.

Consult label on all materials. Observe garden, human, water well, pet, livestock and game limitations and restrictions.

Climatic and environmental changes and differences may require slight alteration of this schedule. Most insecticide/garden sprayers can be used, including engine driven power sprayers, trombone sprayers, garden pump-up sprayers, and garden hose-on applicators. With other than power sprayers with agitation, wettable powders may be difficult to use even when shaking sprayer.

Typical minimum quantities available for pesticides and other chemicals:

Fertilizer — varies from 10-lb. bags to 50-lb. bags to bulk
Dormant Oil — 1 pint
Benlate — 2 ounces (2-lb. bags most commonly available)
Zinc Sulfate — 5-lb. bag
NZN — 1 quart
Surfactant — varies but usually 6 fluid ounce bottle
Malathion — 1/2 pint
Sevin (powder) — 1-lb. bag (more common in 10-lb. bag)
Sevin (liquid) — 1 pint

CONVERSIONS

3 teaspoons	=	1 tablespoon
2 tablespoons	=	1 fluid ounce
8 fluid ounces	=	1 cup
16 fluid ounces	=	2 cups = 1 pint
32 fluid ounces	=	4 cups = 1 quart
128 fluid ounces	=	4 quarts = 1 gallon
16 ounces (dry measure)	=	1 pound

HARVEST

Pecans grown in urban areas are frequently harvested by squirrels and blue jays. It is not uncommon for 25 pounds of nuts to be harvested by a single squirrel. Live traps may be used to trap squirrels and then either transport them elsewhere or fix them for eating.

Pecans should not be allowed to stay on the ground any longer than necessary. They should be placed in an open mesh bag to provide free air circulation until dry. To maintain quality for up to 10 years, they should be stored at zero degrees F. as soon as dry. To save space, the nuts should be cracked and shelled. Shelled pecans pick up odors so should be stored in airtight bags. Pecans at 32 degrees F. will keep in shell for 18 months. Shelled halves at 32 degrees F. will keep for 12 months.

(Revised September 28, 1994)