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B-1546
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KEYS TO PROFITABLE PEACH PRODUCTION IN TEXAS

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The peach is the leading deciduous tree fruit grown in Texas with more than 1 million trees on an estimated 20,000 acres. Average annual production is estimated to be 1 million bushels. The demand for high-quality, Texas-produced peaches remains good and the future appears bright for the industry. The potential for growing fresh fruit is enhanced by the nearness of major growing areas to metropolitan centers, thus enabling growers to market high quality, tree-ripened fruit at premium prices. In planning an orchard, limit it to 5 acres if it is to be a part-time enterprise or 25 acres if one man is to do it all.

Site Selection

Important considerations in selecting an orchard site include soil type, air drainage, water drainage, water quality and market access.

Easy movement of cold air out of the orchard is essential to minimize damage from spring frosts during the bloom period. Thus, the site should have a gentle rolling slope. Natural barriers on the low side of the orchard, such as heavy timber and soil embankments, impede air drainage on cold nights and damage may result. Where possible, avoid steep slopes because of excessive erosion.

Peach trees thrive on a variety of well-drained soils ranging from sands to clay loams, but the ideal is a sandy loam topsoil at least 18 to 24 inches deep underlain with a brightly colored, well-drained clay subsoil.

The subsoil, as well as topsoil, must be fertile and have satisfactory nutrient and water-holding capacities, but it must be especially permeable to movement of water, air and roots. A subsoil that is dull colored, blue, gray or mottled usually has poor drainage characteristics and is not satisfactory. Each county has a soil map, either general or detailed, showing the location of the best soil types for different crops. These maps are available from the Soil Conservation Service office or local county Extension office.

Take soil samples from a prospective orchard site for analysis of inherent fertility and salinity problems. Such analyses assist in making necessary soil amendments and developing an adequate fertilization program. Annual soil analyses from established orchards also are beneficial in maintaining the nutrient status.

Where possible, select sites not previously planted to fruit orchards for establishing peaches. It is best to delay replanting an old orchard site at least 1 year because of soilborne disease problems.

Good water is a must in commercial fruit production. Make water analyses before planting orchards. Water containing high amounts of sodium, chlorine, boron or total soluble salts pose problems.

Variety Selection

Select only varieties of proven adaptability for a given area of commercial use. Planting poorly adapted varieties can result in disaster and disappointment.

Peaches are a temperate season crop requiring a specific amount of chilling winter temperatures, between 32° and 45° F. (chill units), to break their rest period and induce normal flowering and vegetative growth.

Varieties recommended for Texas are listed in table 1. The list is a result of evaluating several hundred varieties and selections. The testing program continues with the annual addition of new, unproven varieties and selections and elimination of undesirable ones. Figure 1 indicates where individual varieties are recommended in the state.

In addition to having the proper chilling requirement for areas in which they are to be grown, commercial varieties must be vigorous, consistently produce satisfactory yields and have acceptable disease resistance. Further, fruit characteristics must meet certain minimum quality standards measured by size, shape, firmness, color and flavor.

Flavor, size and color of early-season peaches generally are not as good as later ripening freestone varieties. Even so, these peaches may be sold for premium prices on the early market because of the high demand and lack of competing varieties.

Plant recommended varieties which meet particu-

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Table 1. Characteristics of major peach varieties for Texas.

	Fruit size	Stone	Chilling requirement	Rip date
Earligrande	Small-med	Semi-cling	200	4/15-4/20
Florda Prince	Small	Semi-cling	150	4/20-4/25
TropicSweet	Medium	Free	175	4/25-5/1
Flordagrande	Large	Semi-cling	100	5/10-5/15
Flordaking	Large	Cling	450	5/15-5/20
Springgold	Small	Cling	750	5/15-5/20
Bicentennial	Small	Cling	700	5/20-5/30
June Gold	Large	Free	650	5/20-6/1
Texstar	Med-large	Semi-free	550	5/25-6/5
RioGrande	Large	Free	450	6/1-6/10
Surecrop	Medium	Cling	1000	6/10-6/15
Sentinel	Medium	Semi-free	850	6/13-6/20
Harvester	Med-large	Semi-free	750	6/15-6/25
LaFeliciana	Large	Free	550	6/20-7/4
Majestic	Large	Free	800	6/25-7/1
Ranger	Large	Free	950	6/27-7/3
Milam	Large	Free	750	7/1-7/10
Redglobe	Large	Free	850	7/1-7/10
Loring	Large	Free	750	7/6-7/11
Denman	Medium	Free	750	7/8-7/16
Redskin	Large	Free	750	7/13-7/20
Dixiland	Large	Free	750	7/15-7/25

lar needs. By using varieties with the proper ripening sequence, the grower can have a manageable harvesting and marketing operation.

Rootstock Selection

The growth, productivity and longevity of a peach tree are influenced greatly by the tolerance of the rootstock to the root knot nematode. Where the nematode is a problem, grow peaches planted in Texas on a nematode-resistant rootstock such as Nemaguard. This variety is resistant to the two important species of root knot nematode found in Texas soils. Contract budding may be necessary to obtain the desired varieties on nematode-resistant stock.

Orchard Establishment

After clearing the orchard site of trees and underbrush, remove roots, especially oak, and level the area. Delay planting 1 to 2 years after clearing to reduce the problem of post oak root rot.

Peach trees grow better and live longer when planted on terraces. While this practice is essential on shallow, poorly drained soils, tree performance is even better on the best of soils. Construct the terraces, or beds, so the tops are 12 to 18 inches higher than the row middles. Terraces do, however, complicate many orchard operations such as drip irrigation, herbicide application and orchard movement.

Spacing

Many years ago peaches in Texas were spaced 30x30 feet. These orchards were clean cultivated and not irrigated. Today growers must plant trees as close as possible to maximize income. Research on tree size shows that the maximum tree canopy is approximately 18 feet in diameter. To fill the space as economically as possible and still leave space to work between the trees, a spacing of 18x24 feet is the most efficient where irrigation and chemical weed control are used. Space nonirrigated or cultivated orchards 24x24 feet to allow for equipment passage and a larger soil mass for the tree to draw from in times of drought. Many other spacings have been used successfully. Growers must be aware, however, that as tree density increases, management also becomes more intense. Some plantings as close as 8x16 have been successful, but they must be irrigated and located only on the best sites.

For optimum success from the planting operation, use the following steps:

1. Purchase healthy, vigorous nursery stock on nematode-resistant rootstocks. June-budded trees ranging from 2 to 5 feet in height are the principal stock used in commercial planting. Trees 30 to 36 inches are usually recommended.

2. Plant trees while dormant from December through early March. Under Texas climatic conditions, early plantings often have more opportunity to become established before growth resumes in the spring.

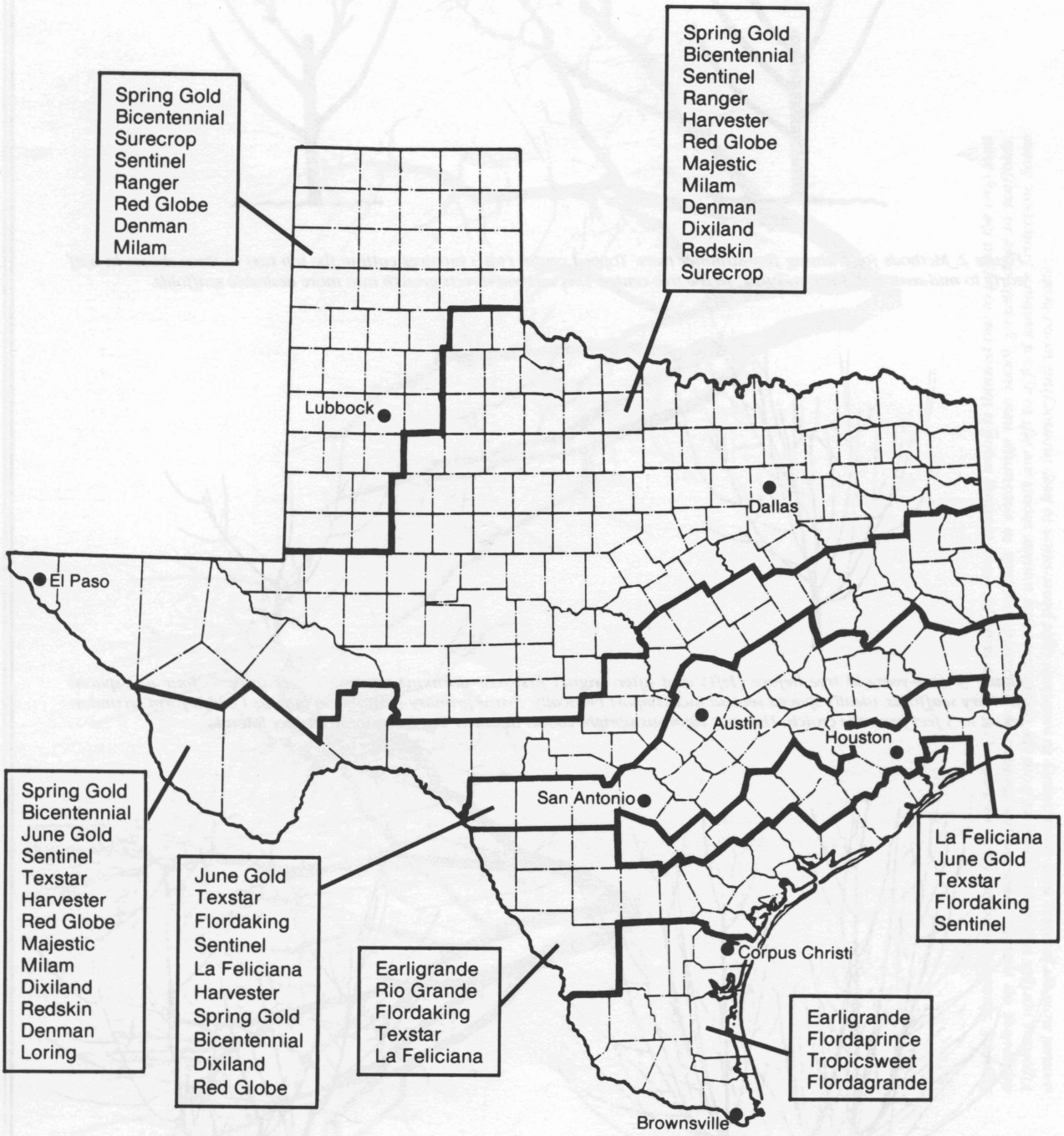

Figure 1. Individual varieties of peaches are recommended for the areas shown on this map of Texas.

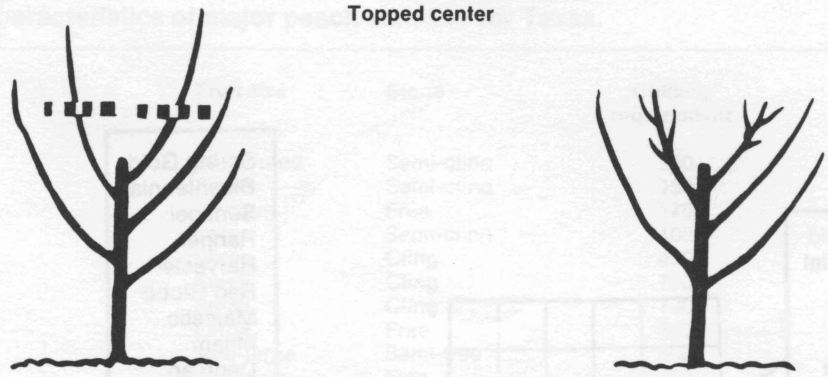

Figure 2. Methods for training first-summer trees. Topped center (top) involves cutting the top two to three shoots in half early to mid-season to form a "bush" in the tree center. This method directs growth into more desirable scaffolds.

Figure 3. One-year-old tree before (left) and after (right) first-year dormant pruning. Select three to four well-spaced primary scaffolds, ideally spaced several inches apart vertically. Prune primary scaffolds to laterals (which form secondaries) 2 to 3 feet from the crotch. Thin out vigorous upright shoots in center but leave some weaker laterals.

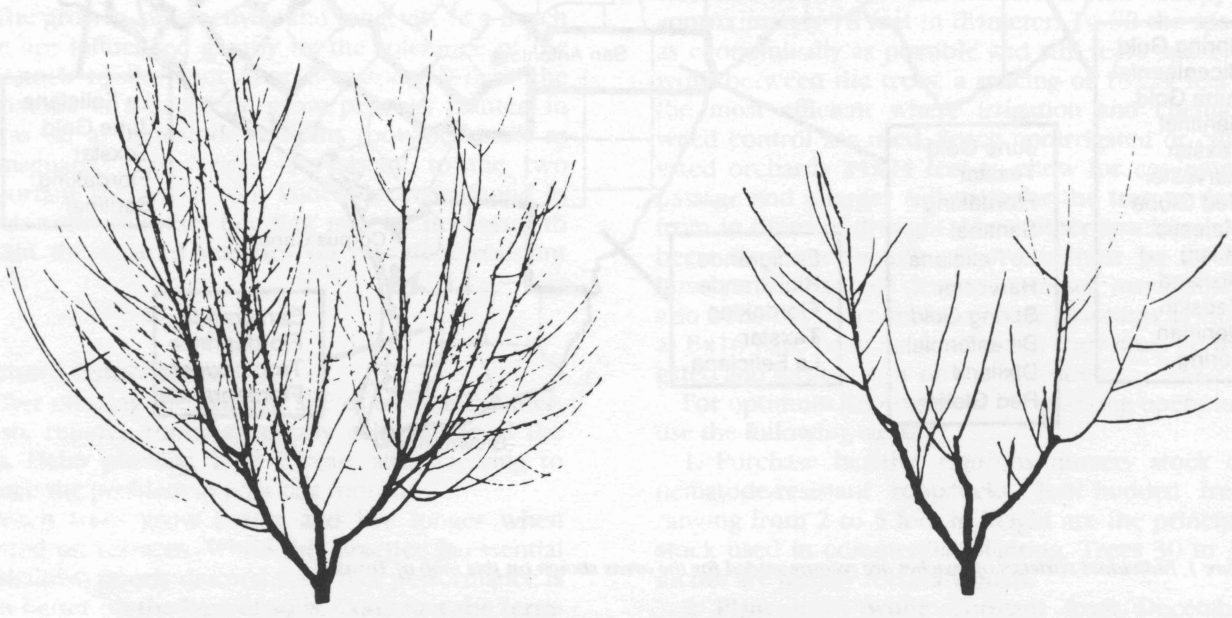

Figure 4. Two-year-old tree before (left) and after (right) the second-year dormant pruning. Select secondary scaffolds at 2 to 3 feet from the crotch. Thin out low and horizontal shoots and excessively vigorous shoots growing toward the center. Maintain scaffolds at a 45° angle, minimizing the use of severe bench cuts.

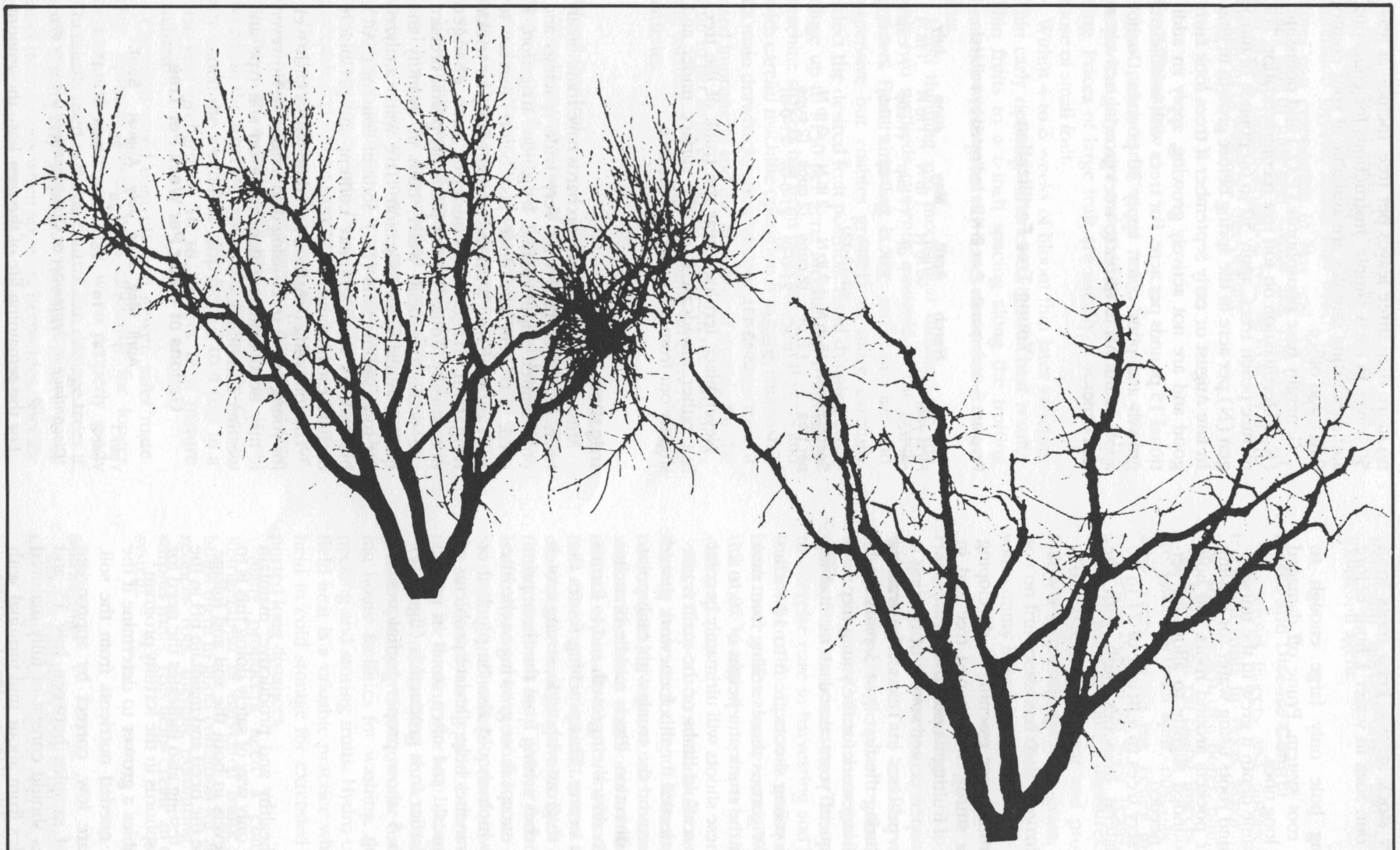

Figure 5. Mature tree before (left) and after (right) dormant pruning. Fruiting wood is thinned out to adjust the crop load depending on variety. Branches are thinned back toward scaffolds to encourage new shoot growth close to scaffolds. Vigorous upright shoots are removed from the center but some weaker shoots are left to afford sunburn protection. Some annual summer pruning may be necessary to maintain light penetration to keep interior fruit wood healthy.

3. When nursery stock arrives, keep roots from freezing or drying out. Soak in water 1 hour before planting.

4. Make planting hole only large enough to accommodate the root system. Prune off damaged roots and cut back long ones.

5. Plant tree at same depth it grew in the nursery.

6. Firm soil around roots using water for settling and eliminating air pockets around roots. Fill hole with loose soil mounded slightly to allow for settling. Add water as needed.

7. Cut back nursery trees to a height of 24 to 30 inches. Remove lateral branches flush with the trunk.

Tree Training

Training and pruning are essential in developing and maintaining a sturdy, well-shaped tree and in regulating growth of fruiting wood.

The three-limb, open center system of training is recommended for peaches in Texas. The training procedure used during the first 2 or 3 years establishes the proper framework for the young tree with pruning in subsequent years aimed at maintaining this framework.

In spring, when young shoots are 6 to 12 inches long, select 3 to 5 vigorous shoots arising from near the same point on the trunk at a height of 20 to 24 inches. Three of these shoots will ultimately become the tree's primary scaffold limbs or the main framework. The three selected for this framework should be evenly spaced around the trunk with each pointing in a different direction. Pinch middle branches and other shoots to slow their growth and to form a tree with an open center. This pinching forces the three main shoots to grow with wide, strong crotch angles. Allow branches arising from the three primary limbs to grow, except those growing to the interior of the tree, which should also be pinched or removed. These branches help alleviate problems of sand blast and sunscald and often result in greater tree growth and earlier fruit production (figure 2). Figures 3 through 5 show proper techniques for subsequent pruning.

Fertilization

To keep trees healthy and productive, maintain fertility levels. The only way of safely doing this is to monitor nutrient levels in both the soil and foliage. Soil tests determine the need and maintain pH in the desired range. Soil testing also indicates the need for potassium and phosphorus in the fertility program.

Leaf analysis enables a grower to determine if the tree has obtained needed nutrients from the soil. Where elements are low, correct by appropriate means. Collect leaf samples between July 15 and August 15. Samples should consist of fully matured leaves. Take samples from about mid-terminal with no more than three leaves per tree. Include at least 50 leaves in each sample. Instructions for collecting and submitting samples are available at your county Extension office.

Generally base phosphorus (P_2O_5) and potassium (K_2O) fertilization on soil test recommendation. For mature peach trees, apply 50 to 60 pounds of nitrogen (N) per acre in the spring before growth begins. In late August or early September if trees look fairly good and are not actively growing, apply an additional 15 pounds per acre. For trees with insufficient growth and poor color, apply 30 pounds. Do not apply additional fertilizer to trees growing actively at that time.

Young Tree Fertilization

Preplant — Incorporate P or P-K as indicated by soil test

	March	April	May	June	July
First year per tree		.08 lb N + P or P-K (1 cup 13-13-13)	.1 lb N (1 cup 21-0-0)	.1 lb N (1 cup 21-0-0)	.1 lb N (1 cup 21-0-0)
Second year per tree	.15 lb N + P or P-K (2 cups 13-13-13)	.2 lb N (2 cups 21-0-0)	.2 lb N (2 cups 21-0-0)	.2 lb N (2 cups 21-0-0)	

Never place fertilizer near the trunk of the tree, but rather broadcast it on the surface under and slightly out from the canopy of the tree.

Irrigation

Most commercial peach orchards have traditionally been grown dryland with very wide spacings and only limited supplemental irrigation. Irrigation, if used, was generally done just before harvest to increase fruit size. With the advent of drip or trickle irrigation, irrigation concepts have changed dramatically. Today, do not plant any peach orchard site without suitable water, both in quantity and quality, available for irrigation. Have water analyzed for total soluble salts (EC), sodium content (SAR), bicarbonate and carbonate content and pH before orchard establishment.

The following irrigation schedule works fairly well for young peach trees using drip irrigation. However, it may need adjusting depending on soil type and weather conditions.

Gallons of Water Per Week Per Tree

	April	May	June	July	August	Sept.
Year 1	7	7	14	28	28	7*
Year 2	14	14	28	56	56	14*

**Discontinue in September or October unless it is very dry.*

For the remaining life of the tree, base the amount

of irrigation on class A Pan Evaporation data. Dr. Jody Worthington, at the Stephenville Research and Extension Center, found that peach trees use 0.5 times pan evaporation in May and September, 0.8 times pan in June and August and 100 percent of pan in July. Design irrigation systems to apply up to 50 gallons of water per tree per day.

Fruit Thinning

Most peach varieties set more fruit than can be grown to a large size and good quality without thinning. Prices of large fruit are usually at least twice those of small fruit.

Within 4 to 6 weeks of bloom thin later varieties. Thin early ripening varieties earlier for best results. Thin fruits to a 6-inch spacing along the fruiting branches which generally leaves about 600 fruit per tree.

Hand thinning and mechanical thinning are the only two methods currently available to the peach grower. Hand thinning is the most precise and expensive but enables growers to more carefully select the desired fruit position. Hand thinning costs range up to $150 per acre. Mechanical thinning by machine shakers has been used for several years and with careful machine operation it is quite successful. Its main drawbacks are a tendency to damage trees if used improperly and the necessity of waiting for the fruit to get large enough to be shaken off. This limits the usefulness of machine thinning on early ripening varieties.

Weed Control

Weed control is one of the more important operations in peach growing. Irrigation and fertilization cannot overcome the ill effects of severe weed competition. This is especially true with first and second year trees.

Historically, weeds were controlled by disking and hand hoeing, but this method is usually not recommended under the newer management system of close space planting on terraces and irrigation. Disking the entire orchard floor caused the loss of irreplaceable top soil on sloping sites.

The most efficient floor management system for most orchards consists of a mowed, native sod row middle with a weed-free strip under the trees. Weeds in the strip are controlled chemically. Gradually widen the weed-free strip from 3 to 4 feet in a first year orchard to 10 to 12 feet in a mature orchard.

Chemical weed control, with newer, safer materials, manages weeds more efficiently for longer periods and at reduced cost when properly used. Chemicals used in weed control can damage trees if used improperly. Read and carefully adhere to all label instructions when applying herbicides. Specific chemical recommendations are available from Extension horticulturists and your local county Extension agent.

Insect and Disease Control

Numerous insects and diseases damage peach trees and fruits in Texas. Major pests include San Jose scale, peach tree borer, plum curculio, peach twig borer and cat-facing insects. Serious diseases are scab, bacterial spot, post-oak root rot and, in some years, brown rot. Fewer insect and disease problems occur in Far West Texas, but they are sufficient to warrant control measures.

To maintain tree vigor and produce clean fruit, follow a systematic spray program. Specific information on fruit pests and their control is available from your county Extension agent.

Harvesting and Handling

Texas-grown peaches are consumed primarily within the state and are hand harvested. Consumers demand dessert-type peaches that are ready to eat when purchased. This means growers need to harvest fruits at a mature stage. This makes it important to exercise care in harvesting and handling. Harvest fruits when firm-ripe and well-colored with a red blush over yellow background. When harvested at this stage, fruits ripen properly and have excellent eating quality.

Several types of containers are used in picking and hauling fruit, including half-bushel baskets, drop-bottom picking bags, wooden boxes and plastic containers. The latter containers are about ½-bushel size and are especially adapted for handling more mature fruit. They may be stacked several feet high on trailers without damaging fruits. Pads in the bottom of these containers help reduce fruit damage. Bruising is also lessened because the same container is used for picking and hauling operations. Larger operations are successfully using pallet boxes with an 18-bushel capacity for hauling fruit to packing houses.

Methods of handling harvested fruits vary among growers. Many growers own or have access to packing house facilities for washing, defuzzing, grading, packing and storing fruits. Hydro-cooling to remove field heat is a valuable practice when fruits must be held in cold storage for extended periods or transported long distances.

Many producers need a cold-storage facility. Refrigeration of harvested fruits at 32° to 35° F. holds them in good condition for about 2 weeks and reduces rots, thereby permitting accumulation of surplus fruits. This helps create an orderly marketing system.

Marketing

Market emphasis now is on consumer demand for high quality, tree-ripened peaches ready to eat when purchased. Today's peach market demands large

fruit, preferably 2¼ inches in diameter or larger, free of insect and disease blemishes and attractive with good color, shape and maturity.

Texas produces less fruit than is consumed within its borders. The presence of 24 major metropolitan areas permits growers to take advantage of these prime markets without hauling fruit for long distances. Although competition from other states is keen, Texas-grown fruits bring premium prices. However, unification for marketing efforts by growers is needed.

Most peaches grown in the state are marketed by the individual grower. Growers utilize a number of market outlets, including sales to local supermarkets, packing shed operators, roadside stands, brokers, wholesalers and direct sales from orchards. Many growers market a large portion of their crop retail because of greater profits.

Costs and Returns

Production costs and returns depend on the nature and size of the operation. Orchards begin bearing commercial crops by the third season and usually remain profitable through 12 to 15 years of age. Reasonable average annual gross returns during this period are $2,000 per acre when fruit is wholesaled. About half this amount usually is realized as net income. Net returns are higher for growers marketing a large portion of their crop retail.

Acknowledgment

Drawings courtesy of Stephen Myers, Extension horticulturist, University of Georgia.

Additional Publications

To request a copy of the *Texas Peach Handbook* at $10 per copy, send check to:

Extension Horticulture-Peach
225 Horticulture/Forestry Building
College Station, TX 77843

Make check payable to the Peach Shortcourse. Other publications are available from your county Extension office.

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Zerle L. Carpenter, Director, Texas Agricultural Extension Service, The Texas A&M University System.

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