

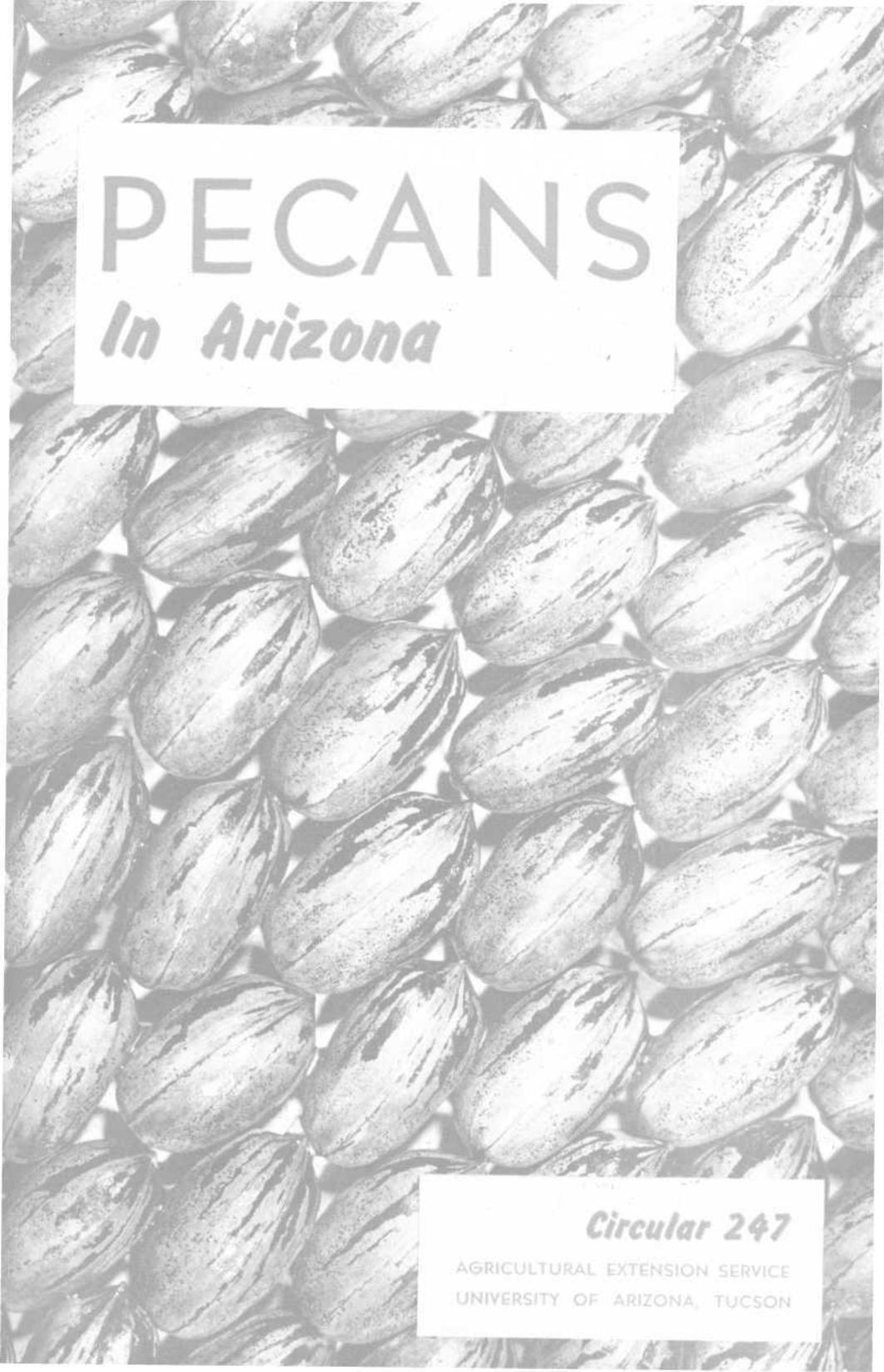
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PECANS

In Arizona

Circular 247

AGRICULTURAL EXTENSION SERVICE
UNIVERSITY OF ARIZONA, TUCSON

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* This is a publication of the Agricultural Extension Service, University of Arizona. See your local County Agricultural Agent or County Home Agent for other farm and home information.

Photo on page 6 courtesy of Horticulture Department, University of Arizona. Other pictures are from the Extension Service Information Office.

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By

Harvey F. Tate

Extension Horticulturist

University of Arizona, Tucson

And

Lewis W. Whitworth

Assistant County Agricultural Agent

Maricopa County

The pecan is a member of the hickory nut group of the walnut family, and is a native of the southern part of the United States and northern Mexico. It was introduced into Arizona in about 1920.

By 1932 there were approximately 4,000 acres of pecans in Arizona. Since then the acreage has been reduced, but the present 1,000 acres of pecan plantings are now expanding in southern Arizona.

Most of the plantings in the warmer valleys of the state do not

receive sufficient winter chilling. This results in reduced blossoming, "May drop" of young nuts, lack of filling, and sprouting of kernels before the hulls open. However, the pecan is very satisfactory as a tree for home plantings where the dual purpose of shade and nuts is desired.

This circular deals with the care of pecans for those who do not depend on pecans as a primary source of income.

Planting and Care of Young Trees

Check Your Soil

Selecting a suitable soil before planting pecans is important. Deep soils, free from an impervious layer of "caliche," hard pan, or clay are necessary for best growth of pecan trees. Soils ranging from a moderate clay to a fairly sandy loam with good drainage are satisfactory.

Avoid soils where the water table is closer than 8 to 10 feet of the surface. Also, avoid soils that have an alkali content too high for satisfactory cotton production.

Select Varieties

Many varieties of pecans have been planted in Arizona since 1920. A few of the most satisfactory are listed below.

It generally takes from 4 to 6 years for pecan trees to bear, and from 6 to 12 years to bear commercial crops.

BURKETT: A variety that has been widely planted in the past. The nuts are medium to large, nearly round, and thin-shelled. The quality of this nut is good some years, but the external appearance is thought by some to be lacking in attractiveness. This nut is subject to splitting and pre-harvest germination. It often does not fill properly.

HALBERT: This is a heavy producing variety. The nuts are small in size, but fairly thin-shelled and of good quality. The tree sheds pollen earlier than any other variety, and continues to do so over a 2 to 3 week period. This variety is used mainly as a pollinizer.

MAHAN: Nuts are extra large, thin-shelled and attractive, but often the kernels are dry and of only fair quality. It is moderately early coming into production and a moderately heavy producer. As the trees age, the nuts often do not fill properly. Fruit thinning is sometimes necessary during years of heavy production to prevent limb breakage. There is a tendency toward poor filling and alternate bearing. Trees have dense, heavy foliage. Very popular because of the large size of nuts.

SAN SABA IMPROVED: Medium sized nut with good quality. It is somewhat late in coming into bearing after planting, but is becoming more popular in Arizona.

SCHLEY: Medium sized nut, thin-shelled, high quality. Comes into production at about the same age as Burkett. Not widely planted because of the small size of nuts.

STUART: Nut medium to large and attractive but has a fairly thick shell. Kernel of good quality; comes into production at a later age than Mahan. This variety is successfully used at elevations from 3,000 to 4,000 feet.

SUCCESS: Nuts are of good quality and medium thin-shelled. They fill well. Comes into production at about same age as Stuart and can be grown at same elevations (3,000 to 4,000 feet). Tends to alternate bearing. One of the most popular

These are Pecan Varieties for Arizona



Halbert



San Saba Improved



Burkett



Schley



Stuart



Western Schley



Success



Mahan

varieties for home planting because of the large, up-standing tree.

WESTERN SCHLEY: Large nut, thin-shelled, very good quality and attractive in appearance. Tree adapted over wide elevation range. At present this is the most widely planted variety for both home yard and commercial plantings.

Proper Pollination Necessary

Proper pollination is absolutely necessary for a good set of pecan nuts.

Flowers of many plants contain female (pistillate) and male (staminate) parts within one blossom.

Pollination of flowers in this group is relatively simple since both flower parts are close together. Pollen matures and sheds at the same time the stigmatic surface of the female flower part is receptive for pollination.

Pollination of pecans presents a more difficult problem since male and female flowers are borne separately on the same tree. The receptiveness of the female flower and the shedding of pollen often do not coincide, and pollination is not successful. Some varieties shed pollen early before the female flowers are receptive. In others, the female flowers are receptive before the pollen is shed. Either of these conditions results in a poor set of nuts.

To insure good pollination, plant some early pollen-shedding variety

"A" shows the female or "pistillate" flower ready for pollination. "B" is the male or "staminate" flower with pollen ready to release. Both flowers are on the same pecan tree, as shown.



with the late pollen-shedding variety. The following table gives the relative period of pollen shedding and stigma receptivity.

Variety	Pollen Shedding	Stigma Receptivity
Burkett	Late	Early
Halbert	Early	Late
Mahan	Late	Early
San Saba		
Improved	Early	Late
Schley	Late	Early
Success	Early	Late
Stuart	Early	Late
Western		
Schley	Early	Late

The Halbert and Success varieties release pollen early and continue over a long period. One tree of either of these varieties will provide ample pollen for several yard trees.

In commercial groves one to three trees, well distributed, to act as pollinizers is sufficient. Pollen is carried by wind throughout the orchard, thus insuring cross pollination.

Space Correctly

In fertile valley soils, permanent pecan trees should be spaced at least 50 feet apart or 25 feet from a building in home plantings. For commercial plantings, early fruiting varieties such as Mahan may be interplanted between permanent trees, making the trees 25 feet apart in the row with rows at least 50 feet apart. Interplanting will result in a larger income during the early life of the planting.

These interplanted trees should be removed whenever root competition starts, usually 12 to 15 years after plantings. Along ditch banks and field borders, pecan trees may

be spaced 25 to 30 feet apart. Such a planting creates a pleasing landscape, provides additional income, and serves as a windbreak

Plant Carefully

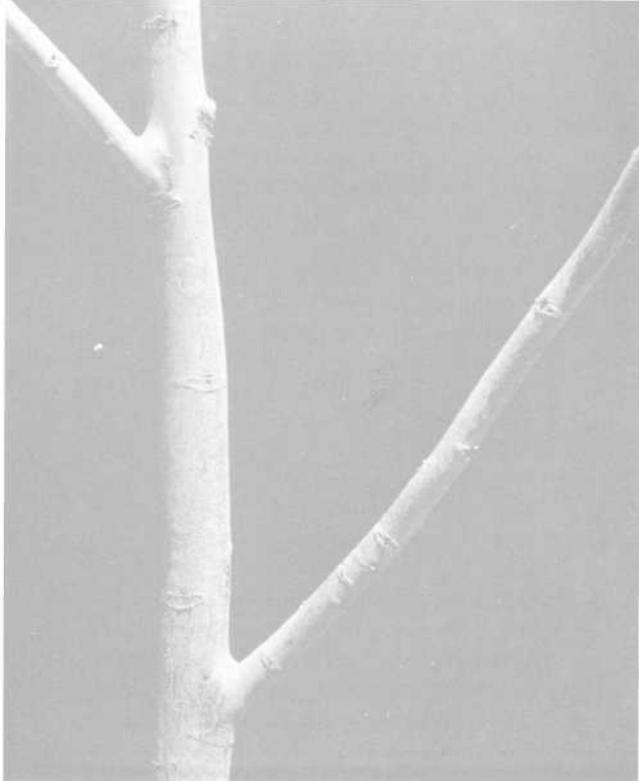
The most desirable pecan trees for planting are those having thrifty one-year old tops, 4 to 6 feet high. The use of over-sized trees is not recommended.

Plant pecan trees between December 15 and February 15 when the trees are in a dormant condition. Trees planted as early in the planting season as possible become well established and develop new roots to support the spring growth.

Prepare tree holes before the trees arrive from the nursery. The holes should be large enough to accommodate the roots of the trees in their normal position and deep enough for the tree to be set one inch deeper than it was in the nursery. The soil line on the trunk will be indicated by a different bark color. Holes may be dug by hand or with mechanical earth augers.

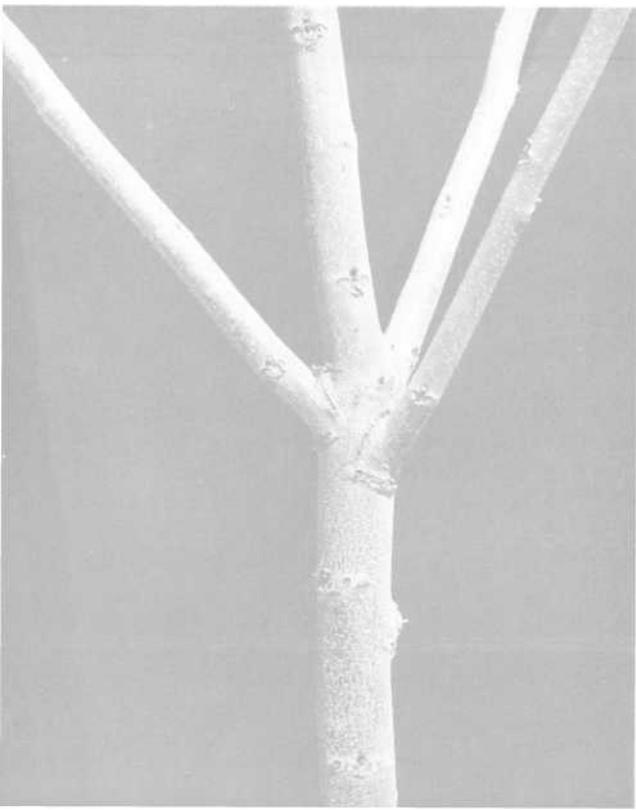
In sandy type soils, the holes may be as narrow as 18 inches in diameter and deep enough to accommodate the root system. With clay soils, however, a thriftier and more uniform growth of trees usually results when holes are dug 30 inches to 36 inches in diameter and deep enough to accommodate the root system.

Do not delay planting after receiving the trees. In case the holes are not fully prepared, the trees should be stored in moist soil, peat, spagnum moss, or some similar material. It is important that the roots be kept moist at all times. Exposure to the sun or drying winds for more than a few minutes will dry out the roots and lessen the chances



RIGHT

This pecan tree trunk has limbs spaced 15 to 18 inches apart. Note that limbs come off the trunk at wide angles making a strong framework with the right kind of crotch.



WRONG

Too many limbs were permitted to grow from one place on this trunk. This makes a weaker tree structure and an undesirable crotch.

of the tree growing when planted.

As the trees are being planted, inspect the root system and prune off any broken or ragged root ends. The length of the tap root should not be cut back except to trim off any possible broken root tip.

The soil should be firmed about the tap root as the hole is being filled, by running a stream of water from a hose, if possible. Use good top soil in back filling around the root.

Do not mix barnyard manure or commercial fertilizer with the soil when back filling. However, a mulch of barnyard manure or organic matter may be used to conserve moisture and keep down weeds. This should be applied on the surface of the soil immediately after planting.

Train Young Trees

At planting time, cut the trunk of the tree back to 30 to 36 inches in height. However, if by July, growth has not started, cut back the tree to within 6 to 12 inches of the bud union to force growth.

Until leaf growth is sufficient to shade the trunk of the tree, a whitewash or cold water paint should be maintained on the trunk for sunburn protection. In home plantings burlap may be wrapped around the trunk or a board placed beside the southwest side of the tree for sunburn protection.

The first two or three years are the most important in developing the scaffold limbs on a pecan tree. When growth starts, encourage the most vigorous upright shoot to form the trunk or central leader. (See photos at left).

From this central leader allow side branches to develop. The first

side branch should be 30 to 36 inches from the ground. Subsequent scaffold limbs should be about 18 inches apart and spaced equally around the trunk as in the top photo at left.

Shoots that occur between the main scaffold limbs should not be removed, but tipped back to retard their growth. The leaves on these retarded shoots manufacture food that results in general growth of the tree.

As a "rule of thumb" do not let three scaffold branches arise from one point as in lower photo at left.

Irrigate At Once

The soil should be thoroughly soaked immediately after planting. During the first year more frequent irrigations will be necessary than during subsequent years.

Frequency of irrigation will vary with soil type, weather, mulch used, etc. On most loam type soils, when a mulch is used, irrigation is generally necessary every ten to fourteen days during the first summer. However, on sandy soils, it may be necessary to irrigate every seven to ten days.

Pecan trees are deep-rooted plants and deep penetration of water is necessary. The soil around the tree should be soaked thoroughly to the full depth of the root system during each irrigation.

Use Fertilizer

For rapid growth, place a 1-½ to 2-inch mulch of barnyard manure, straw, leaves, compost, or other organic matter around the tree after planting.

After the first year a commercial fertilizer such as ammonium sulfate may be applied at 4 to 6-week

intervals for three feedings. Use about one-half cup of ammonium sulfate at each feeding during the

first summer.

Other commercial fertilizers may be used if the same amount of ni-



This young Pecan tree shows typical symptoms of pecan rosette. Note dead tip branches.

trogen is applied. The commercial fertilizer should be spread evenly around the tree on the surface of the ground, and irrigated into the soil.

Watch For Rosette

Pecan rosette causes a yellowing or "chlorosis" between the veins of

the younger leaves. Veins become thickened and the leaves are small, narrow, and brittle. If this condition is not corrected, advance symptoms will be indicated by short internodes, bunching of the foliage (hence the term "rosette"), with the leaves having a reddish-brown coloration. In severe cases



To correct rosette conditions, apply zinc sulfate at the rate of 1 to 1- $\frac{1}{2}$ pounds for each inch of trunk thickness. Apply it in a trench 2 to 4 inches deep about 18 inches from the trunk.

the tips of branches will die.

This condition is termed "rosette" or zinc deficiency. It can be controlled by applying zinc sulfate at the rate of 1 to 1-½ pounds for each inch of trunk thickness (measurement one foot above soil level).

Apply the zinc sulfate in a trench 3 to 4 inches deep about 18 inches

from the trunk. In heavy type soils, higher rates of application are required for effective control of rosette. Cover the material with soil and irrigate thoroughly. Some growers feel that a pound of zinc sulfate per tree at planting time is good insurance in preventing this condition.

Care of Mature Trees

Irrigate Often

Irrigation is one of the most important factors for successfully growing pecans in Arizona. The soil must be kept moist summer and winter as deep as the roots penetrate. The border or basin system of irrigation has proved best for pecans.

Generally speaking, heavy irrigations every 2 to 3 weeks during the summer and 4 to 6 weeks during the winter on loam soils seem satisfactory. On a heavy type soil, the interval may be lengthened by several days to a week.

Add Fertilizer

The fertility of the soil should be kept at a high level to encourage vigor, growth, and heavy production of pecans. If the planting has a cover crop, additional fertilizer will be needed.

A common practice is to use annually 1-½ pounds of ammonium sulfate for each inch trunk diameter (measured one foot above soil line). Any other nitrogenous fertilizer may be used if the same amount of actual nitrogen is applied.

Apply fertilizer in February or March and broadcast it to cover evenly an area extending from the trunk 2 to 3 feet beyond the spread of the branches.

On older trees, when heavy fertilizer applications are necessary, the material may be divided into two applications. Apply these in December and February or March.

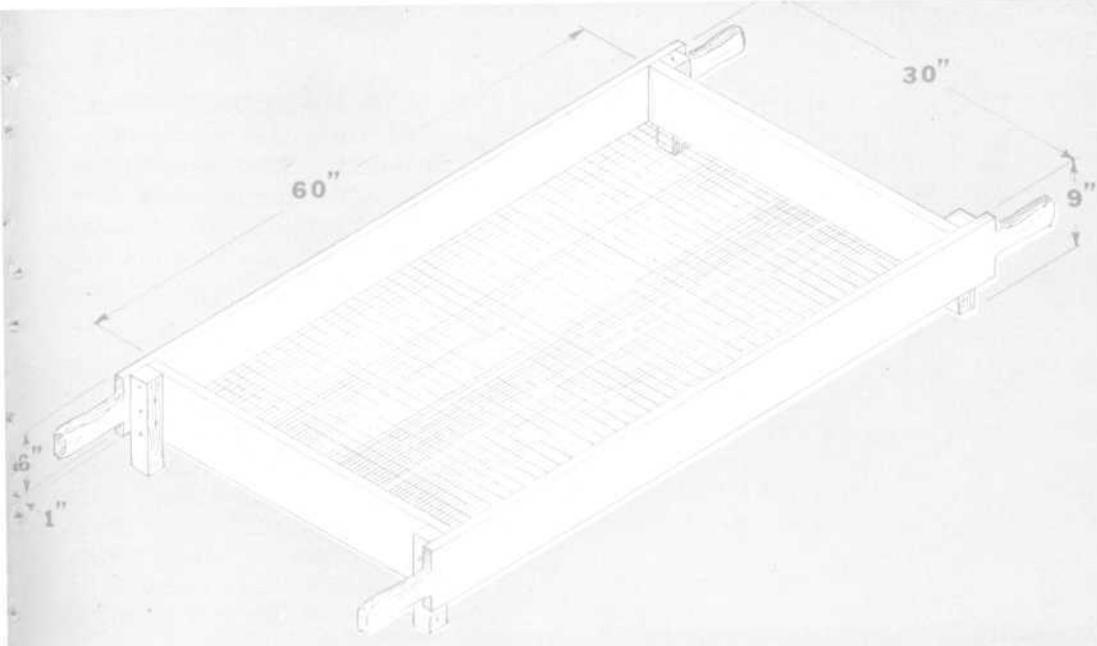
Consider Cover Crops

Many mature pecan groves in Arizona are now being maintained in permanent sod. This practice seems to be satisfactory if sufficient water and fertilizer are applied. The cover crop is harvested by grazing with calves or sheep. Bermuda is a common cover crop used in mature orchards.

For the first few years of a new pecan planting, the area between the rows may successfully be interplanted with a cash crop.

Prune Lightly

If the trees have been properly trained for the first two or three years, no further pruning is generally necessary on most varieties



The tray as shown in the drawing above can be made easily for use in harvesting and drying pecan nuts.

except to remove broken or dead limbs. Such limbs should be cut off even with the main scaffold limb or trunk. Do not leave stubs.

With the Mahan variety, as the trees become older, some pruning may be necessary to thin the branches and foliage and to allow more light into the tree. During years of heavy set, some fruit clusters should be removed to prevent breakage.

Try Topworking

Topworking seedling trees or undesirable varieties to those more adapted has resulted in higher yields and more profitable returns to the grower. This operation should be done as early in the life of the tree as possible.

The methods of budding and grafting are described in Extension Service Circular No. 220, "Top-

working Citrus and Other Trees." Your County Agricultural Agent has a copy.

Harvest In The Fall

Maturity of the pecan nut is indicated by loss of the bright green color of the husks and by the opening of the husks at the tips or along the sutures. Ordinarily this will occur during the latter part of October or November.

Prior to harvesting the nuts, it is advisable to smooth the surface of the soil under the trees so that the nuts may be seen. This will speed up the harvest. It may be accomplished by disking and harrowing if the ground is clean cultivated, or by mowing closely and removing any weeds or cover crop if these are being grown. Large sheets or tarps may be spread under the trees prior to harvest.

As soon as the ground surface is prepared the nuts may be shaken or knocked from the trees. Most growers use a long, light pole to shake or knock the nuts from the clusters. This pole may be made of aluminum or bamboo.

Take care to avoid knocking nuts too far from the tree, or breaking or injuring branches. It is on these twigs or branches that the next year's crop of nuts is produced.

For home yard trees, the nuts may be left in the husks on the trees to cure and used as they fall naturally.

For commercial plantings the nuts are harvested and placed in ventilated trays for drying. These trays may be made from 1" x 4" boards with $\frac{1}{4}$ " to $\frac{1}{2}$ " hardware cloth bottoms. Size would range from 24 to 30 inches wide and 3 to 5 feet long. (See page 13).

These may be movable with handles as in the drawing below. Permanent bins are sometimes constructed in a storage shed.

When harvesting, keep varieties separated. After nuts have been cured, cull out "pops" or nuts obviously not filled, splits, and off-colored nuts. Also, if sizes are variable, grade according to sizes for best market prices.

Storage Is Simple

Pecans can be held in storage for a period of several months to a year. For a few months after harvesting, the nuts can be held at a temperature ranging from 37 degrees to 40 degrees F. If the nuts are to be held for 6 months to a year, they should be put in a cold storage ranging from 32 degrees to 34 degrees F.

If there is any free ammonia es-

caping in the storage room, the nut meats will turn dark and deteriorate in quality. Also, the storage room should be free of odors. The oil in the nut meats readily absorbs odors and nuts may have an objectionable flavor.

These Factors Affect Filling Of The Nuts

The failure of pecan nuts to fill properly may be associated with several cultural practices or environmental factors, no one of which is specific within itself. Proper filling is influenced by one or more of the following factors:

1. Choice of a variety well adapted to the area where it is being grown.
 2. Maintaining good leaf surface on the tree both early and late in the season.
 3. Fertilization early in the season with nitrogen fertilizer to help maintain good vegetative growth.
 4. Irrigation water applied regularly throughout the season so that the tree will not be under stress for water at any time.
 5. Trees planted on wide spacing to allow sunlight to all parts of the tree. If trees are too thick, prune out older or unproductive wood to admit more sunlight.
 6. Control of Rosette or any leaf disease that damages the foliage of the tree.
 7. Control of the black aphid which seriously injures the foliage.
- Anything that affects the normal functioning of the leaf, either early or late in the season, lowers the quantity of plant food. This affects

the development of the nuts on the tree, and the production of new growth, blossoms, and set of nuts for the following year.

Check Rosette

Rosette is a nutritional disease caused by a zinc deficiency. This condition occurs when there is not enough available zinc in the soil to meet the requirements for pecan tree growth and nut production.

In the early stages or on slightly affected trees, rosette appears as a yellowish mottling of the leaves in the tree tops. In the more advanced stages, the leaflets are slightly nar-

rowed and crinkled.

When the trees are severely affected, the leaflets are extremely narrowed and have reddish-brown areas or perforations between the veins. New shoot growth is checked, the internodes are shortened, and the foliage is therefore bunched, or rosetted in appearance, as indicated by the name of the condition. Trees that are greatly affected are retarded in growth and produce no nuts on these badly affected parts. Control for this deficiency is given on page 11.

For any problems with pecans not covered in this circular, please consult your local County Agricultural Agent.

Here are other publications of the Agricultural Extension Service, University of Arizona, that you may like to have. Ask for a free copy from the County Agricultural Agent or Home Agent in your county.

Many other circulars on farm and ranch, and homemaking subjects also are available at your county extension office

Arizona Home Gardening, Circular 130

Lawns for Arizona, Circular 135

Dates in Arizona, Circular 165

Topworking Citrus and
Other Trees, Circular 220

How to Process Your
Home-Grown Olives, Circular 233

Planting and Pruning
Roses, Circular 237

Flowers for
Northern Arizona, Circular 242

Flowers for
Southern Arizona, Circular 243

Control Garden Insects, Circular 122

Control Insects of Flowers.
Shrubs and Shade Trees, Circular 199

Diseases of Garden Crops, Circular 227