

ALABAMA

Agricultural Experiment Station

OF THE

Alabama Polytechnic Institute

AUBURN

THE PECAN IN ALABAMA

By

P. F. WILLIAMS

Horticulturist

Montgomery, Ala.
The Brown Printing Company,
1911



Plate 1. The above shows four of the trees on the Experiment Station grounds at Auburn, Ala. From left to right—Russell, Pabst, VanDeman, and Columbian. These are budded trees eleven years old. This also illustrates too close planting. (Photo by author.)

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THE PECAN

Modern pecan culture has introduced a profitable industry in the Southern States. Northern capitalists are investing in large plantings and pecan orchards of hundreds of acres in extent are appearing throughout the South. There is no reason why southern capital should not be turned this way and thus be kept at home. The pecan is bound to be a leader among the orchard fruits of the future. All nuts have a great food value and for this reason alone pecan growing should be profitable. There seems to be at present a greater interest in pecan culture than in any other horticultural pursuit.

Native pecans have been found in portions of the following states: Texas, Arkansas, Indian Territory, Missouri, Kansas, Illinois, Indiana, Ohio, Kentucky, Tennessee, Louisiana, Mississippi and Alabama. One of the most interesting collections of native pecans was that exhibited by Purdue University at a recent National Nut Growers' Convention. The size and uniformity of some of these northern grown specimens was noteworthy, and shows the possibilities open for pecan work in the colder sections of the country.

Pecan trees for northern planting should be grown from buds or wood of those varieties particularly hardy and should also be on seedling roots produced from seed nuts grown in the north.

Such varieties as Mantura and Appomattox are being quite generally planted in Eastern Virginia. There are many large pecans grown in South Carolina, and considerable interest in pecan planting is being manifest-

ed in North Carolina. The pecan growers of Florida are confined mostly to the northern and western portions of the State. However, successful pecan orchards will be confined to the lower cotton belt as the blooms are less affected by frost in this section.

The staminate blooms are borne on one year old wood and the pistils on the new shoots. Injury to one or both of these flowers from such agencies as frost, excessive rains, or high winds reduces the crop. It is necessary that both the male and female blooms be developed at the same time to insure pollination.

In Mohr's Plant Life of Alabama under *Hicoria pecan* he states that the native habitat is northern Mexico, the Carolinian and Louisianian area, Iowa, southern Illinois, southwestern Texas, Indian Territory, northern Mexico; south from southern Mississippi to Texas and central Mississippi. In Alabama he mentions it in the Central Prairie region, Hale, Dallas, and Marengo counties. It is undoubtedly indigenous to these regions and is extensively cultivated near the coast.

Generally speaking the range of the pecan is confined to the Cotton Belt. However, we have records of pecan trees growing as far north as Niagara Falls and in the Arnold Arboretum, at Boston, Mass. In the latter instances, however, although the trees seem hardy they have not as yet fruited and it is questionable whether they can as far north as this. In New Jersey there are two trees which have been bearing profitable crops for 100 years. This would show that the pecan can be safely planted as a tree in the home grounds in any county in Alabama. It is possible that commercial orchards could be successfully planted in most of the counties of the State but it would not be advisable to set out these large orchards without having more data concerning the

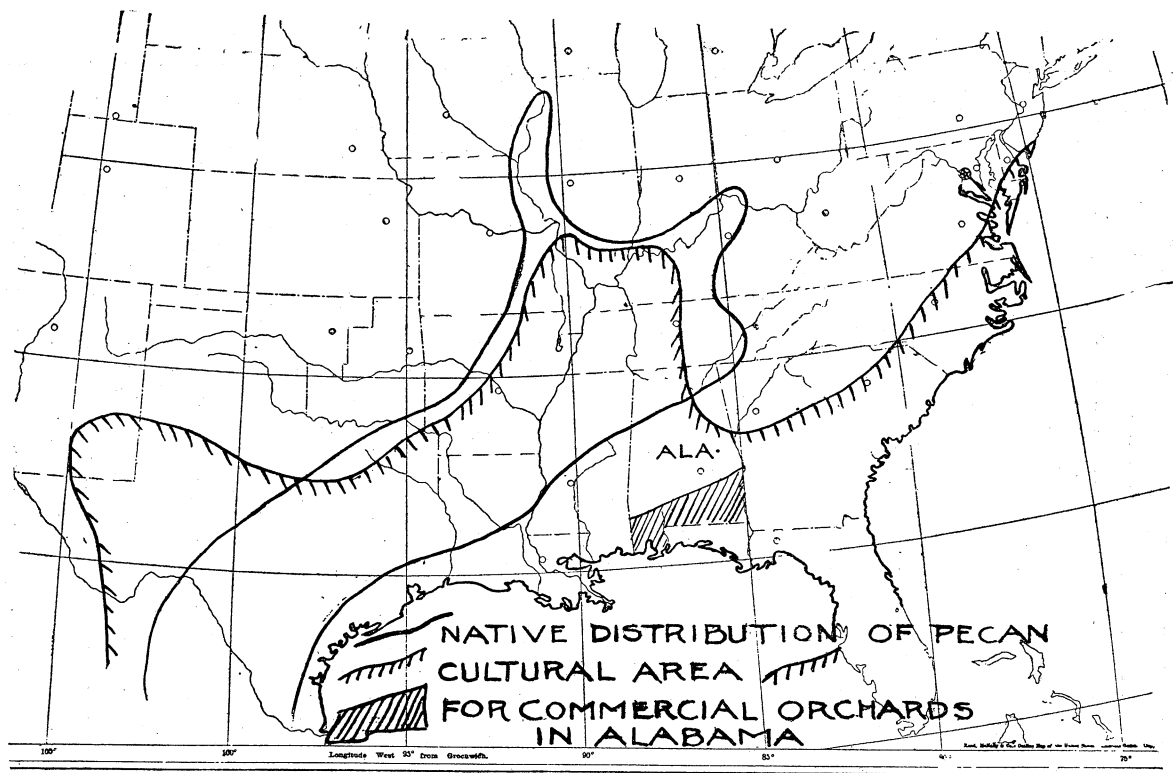


Fig. 1.—Outline map showing distribution of the pecan. The single line represents the native distribution and the shaded line the cultural area. The shaded portion of Alabama shows the area where commercial orchards should succeed.

habits of the different standard varieties in each respective county. The larger pecan groves in Georgia, Mississippi and Louisiana are confined to the southernmost sections. In fact from a recent inquiry as to the pecan industry in Alabama which has been made by the United States Department of Agriculture at the urgent request of the Department of Horticulture at the Experiment Station at Auburn, it is found that the counties growing the greatest number of pecan trees are Baldwin, Mobile, Bullock, Lowndes and Autauga. The returns from this inquiry are rather vague at present as the parties planting the varieties seldom keep records of them and the greater number of trees are seedlings. For instance it is found that in Baldwin county there are 41,000 pecan trees and of this number 25,000 are grafted. In Bullock County there are 12,500 trees and only 600 are grafted. In Autauga county only 3,000 trees out of 23,500 are grafted.

Some of the seedling trees in Texas are between 400 and 600 years old. Many of these produce from 5 to 14 barrels of nuts each year. A pecan tree is considered mature which is between 50 and 100 years old.

There are records of splendid seedling trees in about every section of the State and they often attain an age of hundreds of years and in favorable seasons they continue to mature large crops. There is one tree in Mexico which is five feet in diameter and bearing a ton of nuts annually. As to the attainable age of grafted and budded trees it is still a matter of much speculation. One tree in Mississippi is said to be 60 years old from a graft. The general practice of budding and grafting pecans is of relatively recent origin and does not cover a period of over twenty-five years. Sufficient time has not been given to prove whether with the right soil, right varieties, and proper care the budded and grafted

varieties will continue to bear profitable crops for an indefinite period. The profit obtained from the above orchards in a number of cases prove that the investment has already been a profitable one.

On page 5 will be found an outline map of the United States showing the range of the native habitat of the pecan, also the area where the pecan is cultivated. On this same page the shaded portion of Alabama shows the area where commercial pecan orcharding would undoubtedly prove a paying proposition.

There are several factors which must be considered in locating a commercial orchard. These may be summed up in the following way:

First, the geographical factor; in this the climate and general conformation of the land is included.

Second, the soil factor, and here we meet one of the most important factors. If we go back to the discovery of the first pecan trees we will find that Illinois is given credit for being the first state where it was found. The general theory is that the waters of the Mississippi carried these nuts down toward the Gulf and they lodged along the shores and sprouted in the rich alluvial soil. The finest seedling trees seem to be on these alluvial soils and on what is generally termed "second bottom" land. The pecan is a gross feeder and requires a constant supply of moisture. This accounts for the extreme length of the tap root. It is natural to suppose that the subsoil is for this reason more important than the surface soil. On some of our stiff clays and hard-pans it is practically impossible for the tap root to force its way down below the water table. It would seem important that a thorough examination and analysis of this subsoil should be made before extensive plantings are attempted.

There are scores of inquiries coming into the Horticultural Department at Auburn, concerning the prospects for successful pecan planting in given localities. In the majority of these cases it is a matter of conjecture. The presence of hickories in the locality is not a positive indication that pecans will be successful. Pecan trees may develop rapidly and make splendid specimens, but whether the trees will bear heavily is the important point. Wherever strong growing, prolific seedling pecan trees are found, there is good, strong evidence that pecan planting can be made successful. The hickory will often endure standing water about its base for a considerable period without killing the tree; the pecan cannot stand this and that is one reason why the "second bottom" land is preferred. Here the water table is generally about ten feet below the surface and there is little danger of the orchard being inundated. The richer the soil and the more it is susceptible to improvement the better. As a rule any land that will grow cotton will grow pecans. Deep sandy soil should be avoided and also that which is too wet, sour and soggy to grow an ordinary field crop. Some of the finest trees that the writer has observed are growing on sandy loam, underlaid with sandy clay. Some of the richer soils are apt to produce excessive wood growth at the expense of nut production. Soils may be divided into two classes, those poor in plant food naturally and those made so through continuous and injudicious cropping. Poor land may be brought up to a high state of fertility either before or after planting. This is done by planting either cowpeas or velvet beans. Some of the nurserymen who are growing pecans practice growing a crop of velvet beans on the poorer soils, turning this under in the fall, the year previous to the planting of the pecan seeds. The next summer they grow cowpeas

on this land, generally in drills, so that the peas can be cultivated, as this is generally necessary to produce a good crop of peas on the poorer soils. After the peas are cut for hay, the roots containing a large amount of nitrogenous matter are plowed under to enrich the soil. This treatment of the soil supplies it with humus and puts it in such condition that the commercial fertilizers which are applied later become more available. If this is practiced there is no necessity for fertilizing the young trees at the time of planting.

Newly cleared land should be cultivated for at least a year previous to the planting of pecans. There are some who advocate planting pecans on the newly cleared land, but there is little gained by this. A corn crop followed by cowpeas at the last working should be grown, the latter to be turned under in the fall. Deep, thorough cultivation of the land and the incorporation of sufficient vegetable matter to supply humus is necessary for a successful start. For the first four or five years the young trees should be induced to put on a vigorous growth, especially during the first, second and third years. The soil must contain humus to secure this end.

The third factor is experience. There is a tendency at present to organize a number of pecan investment companies especially in the northern and eastern cities. The officers of these companies should be men of unquestionable integrity and they should have complete confidence in the man who is to superintend the planting and subsequent treatment of the orchards. The superintendent should be thoroughly familiar with general horticultural practices and should have had several years experience in pecan orchards. Preference should be given to the man who has been brought up in the South. The demand for these trained men will tax the

teaching capacities of the experiment stations and colleges of these states. The propagation of the pecan requires more care and thoroughness on the part of the operator than do most plants. If commercial work is undertaken and success is to be assured, a great deal will depend upon the ability of the man in charge of the orchard. He will have to study the market conditions and be quick to recognize just which varieties are going to be profitable where the orchard is located. As an example of this the writer has seen an orchard of several hundred acres cut back and topworked with a variety more congenial to the location before a great loss had been incurred.

The last factor to consider is that of labor. In many of the orchards in Georgia the negroes become skilled in the various orchard practices. However, for the first few years it requires a very great degree of intelligence to properly set and care for the young orchard and there is a demand for reliable men in this field.

PROPAGATION.

This feature of pecan culture really concerns the nurseryman more than the orchardist. However, the small grower and the commercial orchardist have occasion to know the minutest details of this work.

Pecan propagation is rather difficult, hence the relatively high prices of first class nursery stock. Skilled pecan grafters and budders are scarce, and even these men feel fortunate if they secure a 75% "live" or stand. Seasons have a marked effect upon the success of the operation. The bud worm which attacks the buds on the cions just as they are pushing forth in the Spring has also caused a serious loss to the nurserymen.

The first step is the selection of seed nuts. Here there is some chance for controversy. Some nurserymen will



Plate 2. Illustrating the operation of cutting the seedling pecan preparatory to inserting a cion.



Plate 3. Showing the cions inserted and wrapped and soil being drawn over them to keep them moist. (Photos by author.)

say that Texas seedling nuts are preferable, others that native Louisiana seeds are best, and again the Florida grower may prefer the Florida seed nuts. Whichever are used attention should be given to their selection. It is reasonable to expect the finest seedling nuts to produce the most vigorous and best rooted trees.

The practice of cutting out weak seedlings in the nursery row is to be commended.

The nurserymen in the lower gulf section plant the seed nuts as soon as they mature. This obviates the expense of storing the seed by stratification through the winter. Seed are sown either by hand or by machine. These are planted in rows three feet apart, and the nuts 4 to 6 inches apart in the rows, the nuts being planted about 4 inches deep.

After the seeds are covered, rows should be rolled and if the season is dry a light harrow should be drawn over the rows to conserve the moisture. Intensive cultivation is carried on when the growth starts up in the spring. By fall the seedlings will have attained a height of 12 inches and a tap root of at least $1\frac{1}{2}$ feet in length.

Up to a few years ago there were many who urged the planting of seedlings only for the orchard. However, experience has shown that this is unwise for a number of reasons. Although we have some very fine seedling trees producing a fine grade of nuts it is very difficult to determine just what sort of a nut seeds from these trees will produce. Another point might be mentioned here, that the seedling tree generally takes about twelve to fourteen years to produce a crop. Seedling crops are also intermittent or irregular as we find in Texas. Texas supplies about ninety per cent of the pecans on the market. The crops there are irregular and it is generally every third year that a full crop is expected. With the budded or grafted tree this feature is

corrected. Of course there are several things which would cause the budded or grafted orchards to give us irregular crops and some of these conditions cannot well be avoided. For instance, excessive rains at the time the pecan is blooming would tend to produce imperfect pollination. If the trees had to pass through a drought during the summer and the constant supply of moisture cut off from the roots, all of their strength would necessarily be required to mature the crop and the tree would fail to set vigorous buds for the next season's crop. This emphasizes the fact that the orchard should be located where the tap root can always find a supply of moisture.

GRAFTING.

On the two-year seedling roots the cions of the standard varieties are grafted generally about four inches under ground and soil is then banked up to retain mois-

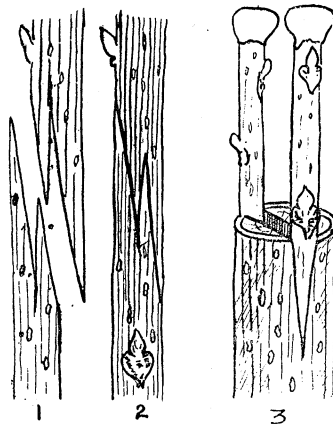


Fig. 2. (1) Showing how cuts are made in whip grafting. (2) Stock and cion united ready for tying. (3) Method of cleft grafting showing proper insertion of cions. Two being placed in stock 2 inches in diameter. Ready for waxing and wrapping. Notice wax placed over cions when cut to prevent evaporation.

ture about the union. The stock should be a little larger than the cion and the grafts should be tied with waxed twine. Ordinary methods of grafting are used with the exception that we cannot use piece roots, the whole root being necessary. The cions are taken from the bearing wood of known varieties and preferably while dormant. These are kept in this condition by packing in damp sphagnum moss and storing in a cool cellar on the north side of a house where the rain will not bother them. Some of the larger nurserymen have installed a cold storage system for holding the cions dormant.

The whip and tongue grafts are made during December, January and February. Above ground grafting is generally more successful when buds are swelling. One method of establishing standard trees in the nursery is to chip bud the two year old roots. In this method a cut is made with a sharp knife straight into the root for about an eighth of an inch and then the knife is placed about three-quarters of an inch above this and a slanting cut made to meet the horizontal cut. A chip corresponding to this section is removed and carefully placed and tied in the root with waxed twine, care being taken not to cover the bud. When the bud begins to push out cut off the top eight to twelve inches above the bud, leaving very little foliage above the bud, so as to keep up the equilibrium between roots and top but only enough of this to allow the bud to obtain slight nourishment. This work is generally done about two weeks before the sap flows. This method requires very careful fitting and wrapping and wood one-half an inch in diameter is required. Trees up to two inches in diameter are successfully budded in this way.

The ring or annular budding is practiced a great deal in top working trees. Top working is a method em-

ployed to completely change the head of a tree. A number of growers plant seedling trees with a view of top working them when the trees have reached a considerable height. This practice should not be encouraged as the trouble and expense involved is greater than the initial cost of standard grafted or budded trees. Again the resulting tops of the trees will be uneven owing to frequent failures of buds to "take." Profitable and interesting work can be done in top working seedling trees in the home grounds. If the seedling tree is not producing a good grade of nuts the main limbs can be cut back, leaving of course two or three of the outside limbs to carry up water and their leaves in turn to assimilate the plant food. Attention should be given to the proper symmetry of the tree. These limbs are cut back in the winter, generally about two weeks or a month before the sap flows. (Fig. 4, No. 4.) From these stumps several sprouts will be thrown out and when they have attained the diameter of an inch or so, which will be during August, buds of the variety desired are inserted in the sprouts about 4 or 5 inches above their union with the stub. Buds are placed in several of the strongest sprouts which insures a sufficient number "taking." The sprouts from these buds will often bear nuts when two years of age. The selected buds should of course be taken only from bearing wood from prolific and vigorous trees. This same principle applies to top working by grafting. Only the very best cion wood should be selected. The entire top of the tree should not be changed over the first year. Trees under 25 feet in height may be completely worked over in two seasons. It will generally take two or three years to accomplish this as a severe cutting back often kills the trees. The stubs are cut cleanly, care being taken that the bark is not torn. (See Figure 4, 2.) This is avoided by mak-

ing two cuts, one underneath and the other from above a few inches further out on the limb. Cleft grafting should be practiced. Notice in Figure 2 (3) the position of the bud. Where the stock is large two cions may be inserted, one on either side. Having the cambiums of the stock and cion in contact wrap the graft with strips of waxed cloth. See that the cut end of the stock is covered with wax to keep out the moisture. If the cion is devoid of its terminal bud cover the end with wax also. Top working can also be done higher up among the branches and with twigs less than an inch in diameter the common whip graft can be employed. (Fig. 2, No. 1.) It is better to select the cion and "stock" that are nearly of a size.

FORMULAS FOR GRAFTING WAX, WAXED CLOTH AND WAXED TWINE.

Grafting Wax.

1. Resin, 6 lbs. ; Beeswax, 2 lbs. ; Linseed Oil, 1 pint.
2. Resin, 4 lbs. ; Beeswax, 2 lbs. ; Tallow, 1 lb.

Break wax and rosin into small pieces and melt over a slow fire and stir slowly, when melted pour out into a bucket of cold water. Caution should be taken to grease the hands well before removing the wax from the water. When in shape to handle pull it until light yellow in color. If the wax is not needed for immediate use it can be rolled up in balls, wrapped in oiled, stiff brown paper and put away for future use.

Waxed Cloth.

Melt the wax in a kettle, drop into it sheets or strips of old calico or cotton cloth. As soon as they are satu-

rated remove them from the kettle and stretch them on a board. For use tear them into strips one-quarter or one-half inch wide.

Waxed Twine.

Drop balls of No. 18 knitting cotton into melted wax and stir four or five minutes until wax has penetrated them.

METHODS OF BUDDING.

The annular or ring budding consists of removing a cylinder about one inch wide containing a dormant bud from the variety to be propagated and transferring it to a place of the same size on the stock on which it is to grow. The cuts in each case are made just through to the cambium. Figure 3 will show the operation. The transplanted bud must be handled carefully and put in place expeditiously as exposure of the bud to drying is very injurious. After a close fit is made the bud should be properly tied. Here there is danger of either tying the bud too tight or not tight enough. Secure a happy medium and there will be no difficulty in getting the bud to "take." It requires from 10 to 20 days for the complete union depending on the season. If this union is complete by September 1st the top may be cut back leaving a few leaves to carry on transpiration. The removal of the top will induce growth in the bud, care being taken to rub off all seedling shoots coming out either above or below the union. After the bud has made a growth of a few inches the remaining portion of the seedling stub above the union may be removed, covering the wound with wax.

Patch budding is done by removing a patch from the tree containing the dormant bud of the variety to be propagated and placing it on a corresponding square properly prepared for its reception on the seedling

stock. Sometimes these patches are square, oblong or triangular. This method is preferable where there is a difference between the size of the budding wood and the seedling or stock. The term semi-annual is often applied to this form of budding. (Figure 3, 5). A practiced budder will readily make the cuts on the stock and the bud wood the right size and there is a point here which should be especially noticed. Rather than have the vertical edges of the patch touch the vertical edges of the stock a very small space is left (about 1-16 of an inch). This allows for the spreading of both the patch and the stock when tying. Otherwise the pressure brought to bear in tying would tend to split the patch through its weakest portion, viz.: longitudinally along the center of the bud, and thus seriously injure it. In both annular and patch budding great care must be exercised in removing the patch from the bud wood as in pulling or lifting the patch the eye is often destroyed. It is unwise to bud unless the bark slips easily. Waxed cloth is the best material for wrapping the buds.

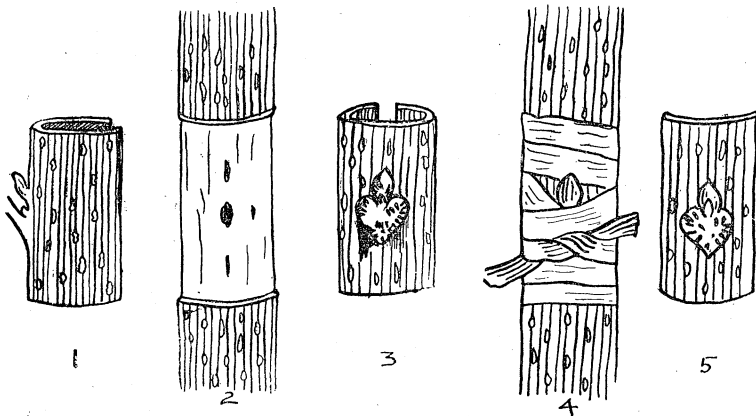


Fig. 3. (1.) Annual cylinder taken from trees for summer budding leaving small portion of petiole of leaf for a "handle." (2) Ring removed and stock ready for reception of same sized ring from another variety. (3) Dormant bud. (4) Bud in place and tied with raffia. (5) Patch or semi-annular bud removed ready for insertion.

Mr. Herbert C. White of Dewitt, Ga., has placed a patented budding tool on the market which is simple and effective. Another successful budding tool has been patented by Mr. Gilbraith of New Orleans and is used quite extensively.

Another method of budding is called the Slip Twig Method where a long sloping cut is made from a cion, sometimes leaving a shoulder and pushing it in between or beneath the bark of the tree and the sap wood. This is practiced after the sap starts in the spring.

Mr. E. W. Kirkpatrick, of McKinney, Texas, has introduced what he calls the Punch Method in budding. This is done by using a punch similar to a harness maker's and is about 1-2 inch in diameter. This simply cuts through the bark to the wood and a similar ring is cut on the stock. The portions within the rings are removed and the one containing the standard bud is placed in the stock. With a stock one-half inch in diameter a punch of 1-4 or 3-8 inches is used. The bud does not stay in the punch but is lifted from the tree with the fingers. This method is used in the spring as the sap begins to flow. It is well worth trying but it has not become a common practice as yet. Mr. H. W. Smithwick has used it successfully at Americus, Ga. The bud should be wrapped with waxed cloth strips.

In selecting all cions and bud wood it is better to take them from the same location if possible as fresh buds "take" best. If a new variety is sought this of course is impracticable. All unions should have the wrappings cut when the cells have filled up all the spaces and as this takes different lengths of time under different conditions it is difficult to say just when the wrapping should be cut. The grower must determine this point by close observation.

Mr. Wm. Nelson was the first to propagate the pecan by budding and grafting on a commercial scale, and Mr. C. E. Pabst of Ocean Springs, Miss., was the first to propagate the pecan by root grafting. There is still some controversy among the nurserymen concerning the relative merits of trees from buds and those from grafts. The followers of the latter system claim that as the union is under ground it has a tendency to withstand winds better than the bud union above ground.

Attention should be called to the fact that many fake or bogus trees are being placed on the market and these can easily be detected where there are grounds for suspicion. With the budded tree the pith would necessarily be discontinuous at the juncture of stock and cion. (See Plate IV.) In the fake budded tree the pith is continuous. Buyers should be cautious of tree salesmen. The latter can do the trade a great deal of harm, and if honest a great deal of good. There are few people who patronize both the salesman and the grower. It is either one or the other and a good, clean, honest agent can build up a good business for his employer. The other fellow not only injures his firm but the good name of the trade at large.

There are so many reliable nurserymen handling pecan trees that questionable tree salesmen should not be given a hearing. The best trees should be purchased, and the buyer must depend upon the honor of the nurseryman, when the latter is filling orders for the standard varieties. The "big" nurserymen in maintaining their integrity, can hardly afford to place trees not true to name on the market. The "smaller" nurserymen can hardly expect to build up their trade without using the greatest care in keeping the varieties true to name. However, in the nursery business, as in practically all

other enterprises, some dishonest parties are encountered.

It is important that orders for trees be placed early. Many of the large pecan nurserymen have already sold at least one-half of their 1911-1912 stock. The first orders receive first attention, and those ordering during the planting season must accept "left overs" and are generally unable to purchase select stock.

STAKING THE GROUND.

The common methods of laying off the orchard can be employed. A good plowman can generally run off rows as straight as necessary both ways of the orchard. In the rectilinear system the stakes can be located either by sighting or measuring. Any light stake serves the purpose. Pecans should not be planted nearer than 50 feet each way.

Mr. J. F. Jones of Jeanerrette, La., has used a very rapid method of locating and lining up trees in planting large orchards. This consists in using a steel wire strong enough to withstand stretching. This is cut into 50 foot lengths, each length being connected by small metal rings. Anchors are attached to the ends and one of these is set firmly on a well defined base line. Half as many men do the staking as there are links. The stake farthest from the base line is placed first and the intermediate stakes are lined from this by the men at the anchor. Eight foot stakes are used for sighting and small stakes for the marking of the place for the tree holes. The wire is then lifted to line the next row, being parallel with the first. In this way 75 acres have been staked in one day.

For the hexagonal system, place stakes at the desired distance of planting along one side of the orchard.

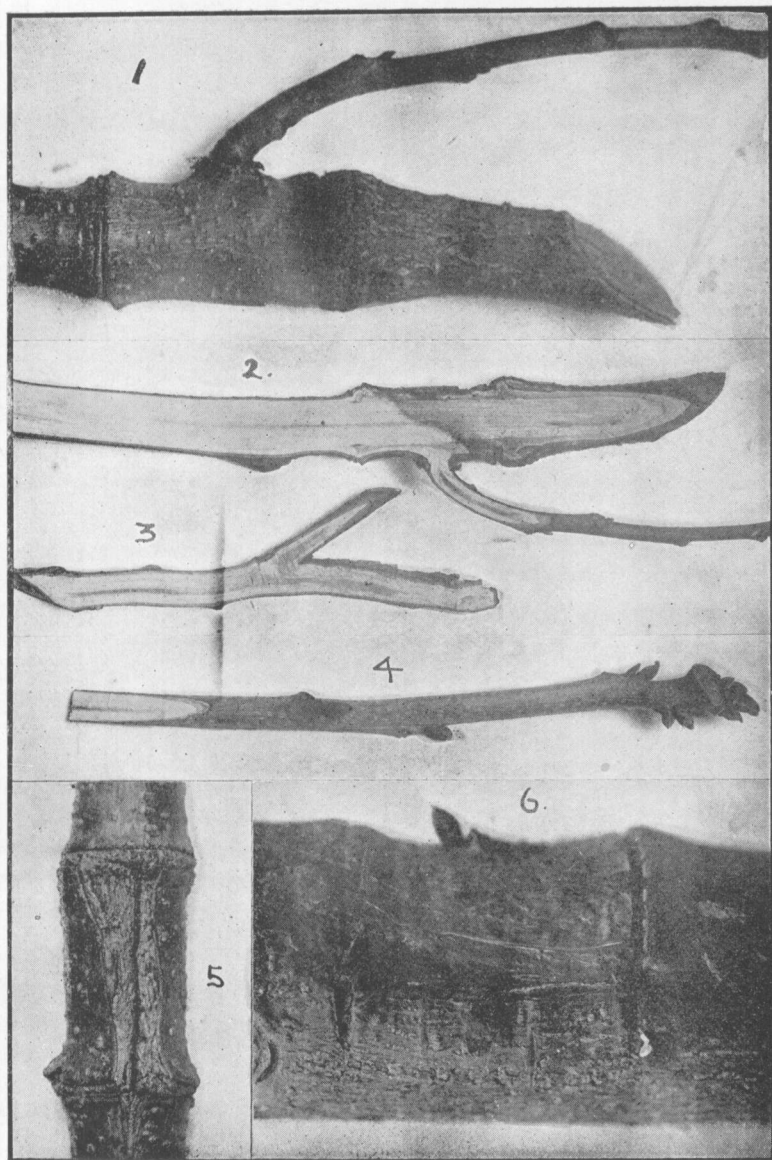


Plate IV.—Fig. 1, Twig growing from an annular bud. Portion above bud not properly cut or protected, and is dying back into bud. Bud tied too tight. Fig. 2 shows appearance of pith in union of bud and stock. Fig. 3, Natural union, pith continuous. Fig. 4, Typical cion for grafting. Fig. 5, Rear view of a calloused annular ring. Fig. 6, Perfect union of a patch bud. (Photos by author.)

Provide two cords, chains or wires of the same length as the distance between the stakes and fasten a ring to one end of each. Starting from the first and second stakes of the first line make equilateral triangles and at the points where the rings join, place stakes forming the second row of stakes. Using this as a base line lay off the third, etc. With the double system of planting as with Satsuma oranges, peaches and pecans use the rectilinear system. For just pecans the hexagonal system is preferable as at least 127 more trees could be planted in 50 acres, planting 50x50 than in the rectilinear system.

PLANTING.

Nursery trees are generally sold according to their height, running from 1 foot up to 10 feet. The experience of the older growers points that the 3 to 5 foot trees come out better than the higher trees. Often the tree is small through being stunted. Such a tree will seldom recuperate and should be thrown out at once. This also applies to the orchard and where one is noticed growing very slowly it should be immediately replaced with a thrifty tree. Again we find that there is often a too rapid growth such as 8 to 10 feet in a season. Buy one year budded or grafted trees on 2 to 4 year roots.

The nurseryman usually prunes the root at the proper place in digging the trees. However the cut may not have been made smooth and this should be examined when the trees are ready for planting.

Two year tap roots should be cut back from 18 to 20 inches. Four to five foot trees should have about 10 inches removed from the top and those of other sizes should have their tops and roots cut proportionately.

This cutting back of the top is done to balance the loss of the root system which is made at the time of digging the trees. Some take trouble to dig out holes 4x4 feet in setting the pecan. This is hardly necessary although plenty of room should be given the roots which when pruned take up more room than any other trees from the nursery. To align the trees the planting board should be used. This is made of 7-8 inch material, 5 feet long and 4 inches wide with triangular notches on one edge near each end and at the middle. The young tree rests in the middle notch while the end notches receive the small stakes driven on the line at either side of the tree hole.

The surface soil should be used for filling and where this is not rich it will be well to thoroughly mix about one pound of commercial fertilizer to the soil which is used in filling the hole. Never let the young tree roots get dry and after planting if there should come a drought, water should be given them. Too little attention is generally given to the planting of all fruit trees. It is one time when the quickest way is by no means the best. This care will have to be given for the first two years.

Young trees show a smaller percentage of loss than older ones going through the transplanting process, and they are much easier handled. It takes the trees some little time to readjust themselves. A loss must be expected in transplanting. All the young trees will not start off simultaneously. Some will soon start out a vigorous growth while others will be more backward. Some may take another year to die. Here then is the necessity for expert care and nursing if the trees are in the early stages of their orchard life. A mulch of leaves or straw should be placed around the tree to prevent evaporation.

TIME FOR SETTING TREES.

The fall is the best time for this. Dormant trees set in the fall establish themselves through the winter and are ready in the spring to push out their buds. From the latter part of November to the first of February is the best time for Alabama. The earlier in this period the better.

ORCHARD MANAGEMENT.

As previously stated the commercial orchard should have the entire attention of the superintendent. Profits commensurate with the investment cannot be realized otherwise. After the pecan orchard comes into bearing it requires less attention than the peach or apple orchard but should not be neglected.

Do no pruning in the summer as the main object is to establish a strong vigorous root system and an abundance of leaf surface brings this about. Pruning the mature tree should have no further object than to keep the shape symmetrical. The wounds should be painted with white lead. The sketches below indicate some phases of pruning. In making all cuts be sure that they are smooth and with the larger cuts, those over an inch in diameter, do not leave stubs, with the exception of the stubs left for top working.

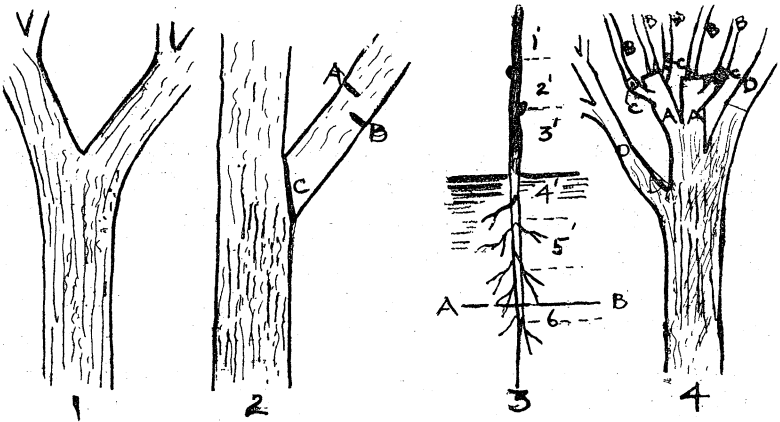


Fig. 4. (1) Avoid crotched trees. (2) Method of cutting larger limbs to save tearing of bark. Note the three cuts at A, B and C. A smooth cut at C insures immediate healing of wound. (3) Young pecan tree showing relative length of top and tap root. Cut root at AB. (4) Top-working—D limbs left for proper transpiration. A stubs cut during the winter. B sprouts from these budded during summer at C.

Small groves generally pay better as they receive more attention. With the small grove however there is a tendency to plant the trees too closely and without skillful pruning the bearing wood of each tree will interlock and tend to scrape off the nuts. Again proper spacing allows for more successful intercropping, especially during the unproductive period.

CULTIVATION.

When the growth starts in the spring, the soil should be plowed and leveled, this to be followed by a shallow cultivation every ten days, until July 10th or 15th. The light harrowing should be practiced, following rains, as soon as the ground can be worked. Where the harrow does not reach the hoe should be employed. Bearing orchards should have cowpeas or velvet beans planted between the rows.

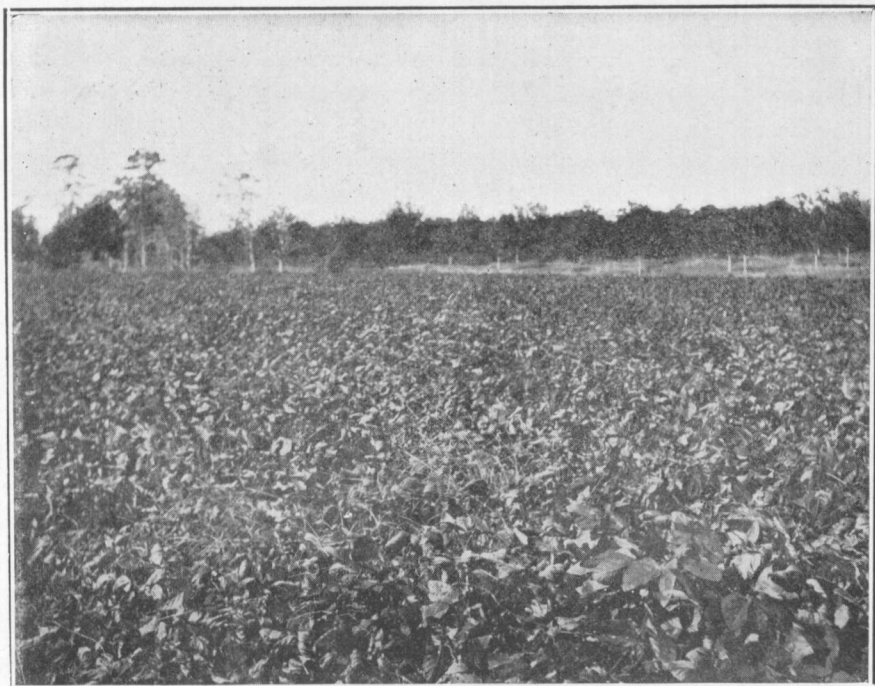


Plate V. Showing a field of velvet beans in the Gulf Coast section. An excellent land builder. (Photo by author.)



Plate VI. Showing thrifty nursery stock.

Care should be taken to keep out weeds and grass between the trees and from 6 to 8 feet on each side of the trees. Four or five rows of cowpeas can be planted along each side of the pecan rows leaving a sufficient space between the trees and the first row of peas to allow plows to pass. The central space may be planted in cotton, potatoes, corn or other crops. This central space will diminish in size each year as there must necessarily be more rows of peas added each year to furnish nitrogen for the extended root system of the trees.

In the management of the grove there is an ideal to be kept in mind and that is the producing tree. With the consumer the nut itself is paramount.

FERTILIZERS.

With a vigorous mature tree the lateral roots spread as far as do the branches. When the fertilizer is applied it should be spread so that it will reach these roots. If manure from the stable is to be used care should be taken to balance it with applications of phosphoric acid and potash. Potash tends to promote healthy wood and to some degree resistance to fungus troubles. Potash will also help to keep the nut clusters from falling before they mature.

Commercial fertilizer shows its effect for early growth and the stable manure later. Wood ashes are beneficial to growing trees. Before any fertilizer is applied the soil should be studied. Good cultivation will often do more good than the most judicious fertilizing. Mr. Pabst of Ocean Springs, Miss., depends on cultivation and intercropping with cowpeas.

But little growth should be expected from the young trees the first season after planting. On rather poor soils a forkful of well rotted stable manure spaded in

around it just beyond the roots is beneficial. Some growers use 1 pound of rotted manure and 1 pound of commercial fertilizer for each tree every year. A complete fertilizer hoed in about each tree during the early spring is beneficial, as follows:

First year set -----	1 pound
Second year set -----	2 pounds
Third year set -----	4 pounds
Fourth year set -----	4 pounds
Fifth year set -----	12 pounds

The above should be applied in circular bands about the tree increasing the diameter of these bands each year. The older trees in the orchard should have an application of from 500 to 1,000 pounds per acre of a complete fertilizer harrowed or plowed in if the trees are not making sufficient growth (at least a foot per year.)

For bearing trees 750 pounds of the following formula should be used where legumes are grown:

300 lbs. bone meal.
 150 lbs potash 50%.
 300 lbs. C. S. M.

750 lbs per acre.

If legumes are not grown the following fertilizer should be applied:

400 lbs. bone meal.
 200 lbs. potash 50%.
 400 lbs. C. S. M.

1000 lbs. per acre.

This same fertilizer contains about the right proportion for truck crops. Different soils will require different quantities of the above mixtures. The poorer soils which leach badly will often require as much as 2,000 pounds of high grade fertilizer per acre when the trees are from 12 to 20 years of age.

Good results are being obtained with Thomas Phosphate as the source of phosphorous. The presence of lime in this has a tendency to neutralize the soil, a fact to be considered in most parts of the State. An application of ground lime is often beneficial.

One-half the fertilizer should be applied just previous to the pushing forth of the buds in the spring and the remainder during June.

The behavior of the trees will indicate to a great degree their need of fertilizers and there is as much danger of over-fertilization as under-fertilization. The potash and phosphoric acid should be applied before the growth starts and the second application consisting principally of the nitrogenous matter can be applied with good effect the latter part of May or first week in June. Applying the nitrogen first induces a too rapid wood growth.

INTER-CROPPING.

There are many systems of inter-cropping the pecan orchard and as this can be done with a considerable profit it makes the time that is generally occupied by the pecans in coming into maturity of relatively little importance. The fact that it does take from eight to twelve years for an orchard to become of commercial importance discourages many prospective planters. Among the crops that may be grown are cotton, cow-peas, corn and truck crops. There are many planters

who place a pecan tree every 60 feet running each way in the peach or pear orchard. At the time that peach and pear trees are past their usefulness and are cut down, the pecan orchard is left and is in bearing. The cultivation, fertilization, etc., given to the peach and pear trees are equally as beneficial to the pecan trees. In planting cotton and corn care should be taken not to plant either within eight feet of the young pecan trees and this distance should be increased as the trees grow older.

In the lower sections of the State, especially in Mobile and Baldwin counties, the Satsuma orange is being planted as a "companion" or inter-crop with the pecan and this is highly recommended. Some are planting figs between the pecans but this should not be done as figs will not stand deep cultivation and will eventually retard the development of the pecans.

VARIETIES FOR PLANTING.

Of the thousands of questions asked concerning pecans the greater portion concern varieties. In fact there is more to learn concerning varieties and their adaptability to environment than any other feature of the work. There are at least 150 known varieties which have been recognized to date. There are thousands of others possibly of equal merit and having local names as Seedling No. 1, etc. The National Nut Growers' Association has done a great deal to give us a nomenclature which means something. A few years ago there was a great confusion concerning pecan names but workers in the above association have obviated many of the difficulties.

There are very few people who recognize the difference in the quality of pecans but the time has been pre-

dicted when the market will call for special nuts as it now does for Baldwin apples, Bartlett pears, etc. When we realize how few people in the eastern and northern cities know what our standard pecans look and taste like that day seems far distant. Some are led to believe that size is all important. As a matter of fact the medium sized nuts generally have the sweetest meat and fill the best. The external appearances of the nut will deceive the layman but the internal qualities are more important. We find a great difference in shapes. The best fillers are usually blunt at the ends with no space which cannot be utilized by the kernel. There are exceptions and one or two of the best nuts on the market have their ends drawn out to a point.

The nuts which produce 60 per cent kernel have from 60 to 80 nuts to the pound. These statistics have been gathered by the U. S. Department of Agriculture. Very few of the large varieties running about 40 to 50 to the pound yield over 50 per cent kernel.

Another distinguishing feature is the cracking quality. The ideal nut of some growers is one having as thin a shell as the San Saba, an excellent pecan grown in Texas. The term Papershell or Eggshell pecan is given to most any nut which can readily be cracked in the palm of the hand. Where the variety cannot be determined this term is often given and causes considerable confusion to those interested in proper nomenclature. From the statistics gathered by the U. S. Department of Agriculture on the pecan in Alabama about 18,000 trees were classed by the growers under the general term "Papershell." Without personal inspection of the products of these trees we are little better off than had the owner placed in the list "Variety Unknown." The following list of varieties is noted in the various counties of Alabama. The numbers after the

varieties represent the counties in which they are growing, the list of which is given below the variety column.

VARIETIES.

- Admiral Dewey, (2 and 19).
 Alley, (2).
 Bolton, (2).
 Delmas, (19, 27 and 23).
 Centennial, (2,21).
 Capitol, (23).
 Columbian, (3, 31, 33, 40 and 53).
 Crawford, (2).
 "Eggshell," (33).
 Frotscher, (2, 19, 27, 31, 33, 40 and 52).
 Georgia, (2, 27, 31 and 33).
 Mammoth, (2).
 Mobile, (23 and 53).
 Money-maker, (2 and 33).
 Pabst, (2, 3, 21, 31 and 33).
 "Papershell," (1, 2, 4, 10, 11, 12, 14, 15, 16, 18, 19, 21,
 26, 31, 37, 37, 40, 42, 48, 52, 53).
 Roosevelt, (31).
 Russell, (3, 21).
 Schley, (2, 3, 19, 27, 31, 33, 48, 50 and 52).
 Senator, (2).
 "Soft Shell," (35 and 41).
 Stuart, (1, 2, 3, 15, 19, 21, 27, 31, 33, 50 and 53).
 Success, (33).
 Taylor, (21).
 Van Deman, (3, 21, 31, 33, 50 and 53).
 Counties.—1, Autauga; 2, Baldwin; 3, Bullock; 4,
 Butler; 5, Calhoun; 6, Chambers; 7, Cherokee; 8, Chil-
 ton; 9, Choctaw; 10, Clark; 11, Clay; 12, Coffee; 13,

Conecuh; 14, Coosa; 15, Covington; 16, Crenshaw; 17, Cullman; 18, Dale; 19, Dallas; 20, DeKalb; 21, Elmore; 22, Escambia; 23, LaFayette; 24, Franklin; 25, Greene; 26, Henry; 27, Houston; 28, Jackson; 29, Lamar; 30, Lauderdale; 31, Lee; 32, Limestone; 33, Lowndes; 34, Macon; 35, Marengo; 36, Mobile; 37, Monroe; 38, Montgomery; 39, Morgan; 40, Perry; 41, Pickens; 42, Pike; 43, Randolph; 44, Russell; 45, St. Clair; 46, Shelby; 47, Sumter, 48, Talladega; 49, Tallapoosa; 50, Tuscaloosa; 51, Walker; 52, Washington; 53, Wilcox.

The six leading counties in pecan plantings up to the present are Baldwin, Mobile, Lowndes, Autauga, Bullock and Butler. These counties with their respective varieties and number of trees follow:

BALDWIN COUNTY.

Varieties: Alley, Admiral Dewey, Bolton, Delmar, Frotscher, Georgia, Mammoth, Pabst, "Papershell," Pride of the Coast, Schley, Senator, Stuart.

Total number of trees, 41,525; of these 25,077 are grafted trees.

MOBILE COUNTY.

Varieties: Aurora, Delmas, Pabst, Russell, Schley, Stuart, Success and VanDeman. Total number of trees, 23,900; of these 22,300 are budded or grafted.

LOWNDES COUNTY.

Varieties: Columbian, Delmas, "Eggshell," Frotscher, Moneymaker, Schley, Stuart, Success, Twentieth Century, Mobile, Georgia and Van Deman. Total number of trees, 16,170; of these 13,821 are grafted.

AUTAUGA COUNTY.

Varieties: "Papershell," grafted 1,050; Stuart and Pride of the Coast, grafted, 1,500. Unknown, 11,130. only 873 of the latter grafted. The total number of trees is 14,680.

BULLOCK COUNTY.

Varieties: Columbian, Stuart, Pabst, VanDeman, and Moneymaker. Total number of trees, 9,524; of these 305 are grafted.

BUTLER COUNTY.

Varieties: "Papershell," Total number 6,630; of these 780 are grafted. Unnamed, 1,200. Total number of trees, 7,830.

The next sixteen counties are:

Wilcox	Total No. trees,	4,675; grafted,	1,225
Washington,	Total No. trees,	3,675; grafted,	1,242
Macon,	Total No. trees,	2,537; grafted,	75
Houston,	Total No. trees,	2,500; grafted,	1,025
Montgomery,	Total No. trees,	2,200; grafted,	150
Talladega,	Total No. trees,	1,625; grafted,	1,268
Clark	Total No. trees,	1,600; grafted,	1,115
Dale,	Total No. trees,	1,590; grafted,	959
Tallapoosa,	Total No. trees,	1,340; grafted,	12
Monroe,	Total No. trees,	1,300; grafted,	430
Pike,	Total No. trees,	1,270; grafted,	120
Dallas,	Total No. trees,	1,262; grafted,	935
Covington,	Total No. trees,	1,035; grafted,	176
Henry,	Total No. trees,	1,000; grafted,	750
Russell,	Total No. trees,	1,000; grafted,	223
Sumter,	Total No. trees,	1,000; grafted,	

Total for the above 16 Counties, 29,609; grafted, 9,705

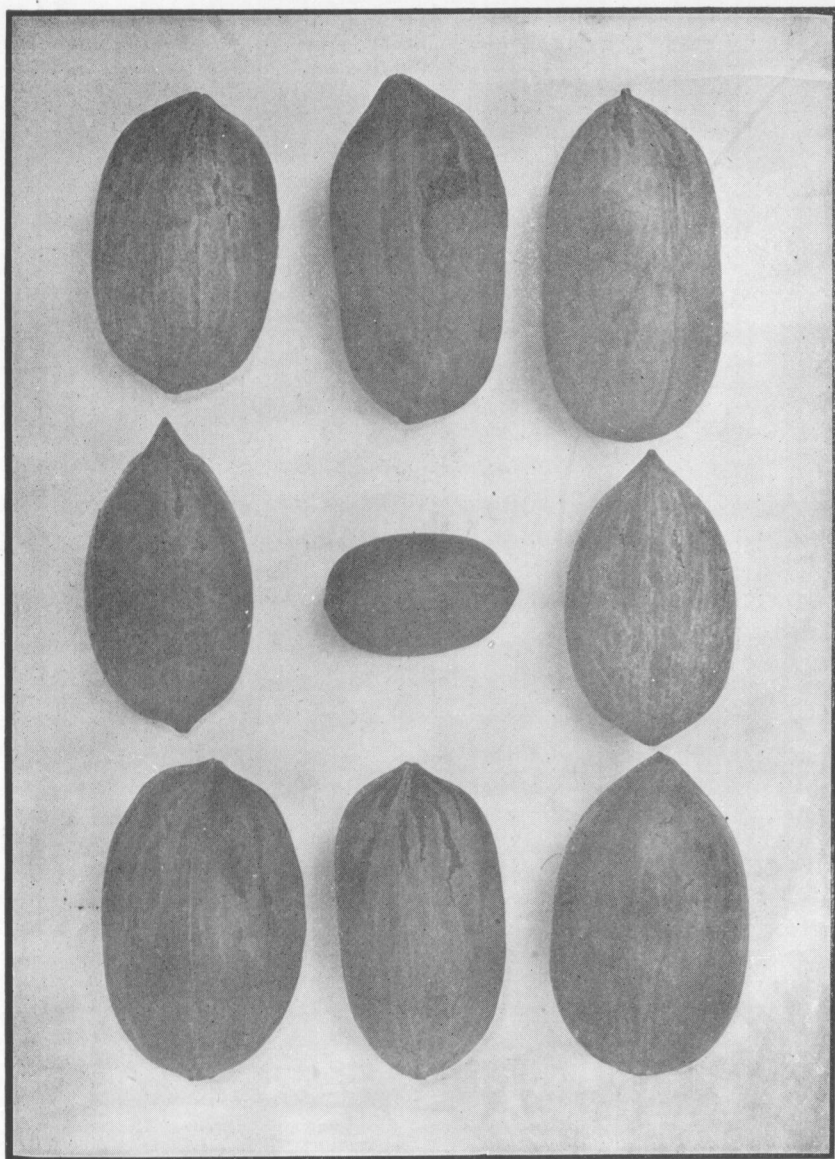


Plate VII. The varieties shown above are as follows Rows reading left to right. Top, Stuart*, VanDeman*, Columbian*, Middle row, Schley, Seedling, Russell*. Bottom row, Success, Pabst*, Frotscher. Natural size. *From Experiment Station trees. (Photo by the author.)

From the figures given for the six leading counties we find that about 50 per cent of the trees are standard or grafted. From these trees then we will expect to determine their adaption to their respective counties.

Taking the figures of the next 16 counties about 30 per cent of the trees are grafted or standard trees. These figures are approximate in a number of cases and the returns from the inquiry are not complete. There is a greater amount of work to be done in all the counties in gathering accurate knowledge of the habits of the various varieties. The farmer is generally too busy with other things to notice the blooming dates of pecans, age of tree when first nuts mature, etc., but these records must be obtained before recommendations can be given concerning the selection of varieties of each section of the state. A Frotscher which will bear abundantly, is free from scab, vigorous, etc., in Baldwin County may show up poorly in Jefferson County and vice versa. In choosing varieties individual tastes are to be duly considered. There is a great difference in market value and quality. As a rule a nut having the following qualities will meet a ready market: tree vigorous and prolific; nut medium and thin shelled, of good keeping quality and of delicious flavor. Note in the following tables used in scoring nuts by the National Nut Growers' Association, especially the points on which emphasis is placed.

TREE.

Vigor, 10 points; Habit, 10 points; Toughness, 10 points; Resistance to disease and insects, 10 points; Precocity, 10 points; Uniformity in Spring, 10 points; Productiveness, 40 points. Total, 100 points.

NUT.

External Characteristics: Size, 20 points; Form, 5 points; Color, 5 points.

Shell Characteristics: Thinness, 10 points; Cracking qualities, 20 points.

Kernel Characteristics: Plumpness, 20 points; Color, 5 points; Quality, 15 points.

Total, 100 points.

The nuts from seedling trees in many instances planted from the tree of a known variety under some circumstances are difficult to distinguish from the parent nut. These same trees in another locality generally appear much different and in nearly all cases inferior. With the older standard varieties many of them are found far out of the section where the first tree was found and as no records of the parent tree, in many cases, are found, it is very essential that these varieties be kept true to name in recording the locality habits. Trueness to name is of vital importance to large growers as trees failing in this may have to be top-worked which means expense and trouble later.

MARKET VARIETIES.

CHARACTERISTICS. Some of these are covered with a grimy, sooty appearance which is objectionable. A shell which has a clear, clean, reddish rather than grey shell is preferable. Often dark colored streaks appear in varying lengths about the apex on many varieties and serve to distinguish them. With the present market, pecan polishing is practiced but should be discouraged. It is entirely unnatural and the pigments used are apt to cause the kernels to become rancid.

An experienced pecan grower can recognize many of the varieties by the habit of the trees and especially by the color of the bark on the twigs. For instance the VanDeman has characteristic dark wood. The disposition and appearance of the spots on the bark also distinguishes many varieties.

The Centennial was undoubtedly the first pecan to be propagated by grafting. According to Prof. Wm. A. Taylor, Dr. A. E. Colcomb took cions from the original tree in Louisiana and grafted them into 16 trees during the winter of 1846 or 1847. This was the beginning of modern pecan culture.

From the tables of varieties and counties on page 24 it will be seen that the following are prevalent: Stuart, Pabst, Frotscher, VanDeman and Schley. There are of course many fine trees in the State of the other varieties but the five mentioned prevail at present. The Stuart seems to be successfully grown over a wider territory than any of the others.

The frontispiece shows a view of eleven year old budded trees on the Experiment Station grounds at Auburn. These were set too close together and hardly give a fair test of the merits of each variety. The five varieties, VanDeman, Pabst, Russell, Columbian and Stuart are all bearing good crops but it is of course impossible to secure accurate yield records with students to keep away from the trees. Last year about 5 pounds of a complete fertilizer was applied to each tree previous to blooming time and it made a marked increase in the yield and quality of the nuts.

COST OF TREES

It pays to start with good trees if they do cost a little more. These should be secured from reliable nur-

serymen whose prices are generally reasonable. The cost per tree ranges from 50 cents to \$2.00 according to size. The advantage in securing the higher priced budded or grafted tree over the seedling lies in the fact that with the former they will come into bearing at least within 5 years (often in 3) from the time of planting, whereas the tree from the seed will generally require from 12 to 14 years, and may never bear. Again, there is always uncertainty as to the size of the nut the seedling will produce.

The man with limited capital should begin in a small way with the best trees. He should plant seed nuts from thrifty trees to be used as stocks into which the buds or cion wood from his few standard trees can be inserted. This is a slow method, but a sure one as the grower knows exactly what to expect. A part of each year's growth of the standard trees can be cut for bud wood or cions without detriment to the trees and this surplus can be readily sold to nurserymen where the varieties can be guaranteed. Supplying this wood from excellent trees is very remunerative."

Mr. Turnipseed, of Union Springs, Ala., has been very successful with seedling trees but it is very doubtful if seeds from these trees will do as well in other locations, as they do with him. The writer agrees with Prof. Hume when he says, "Plant budded or grafted pecans but if not these ----- pecans!"

HARVESTING AND MARKETING.

There is less trouble in harvesting pecans than with most of the horticultural crops. Whatever we place on the market should appear in the best shape possible. The equipment necessary is an extension ladder, step-ladder, light long poles, sacks, twine, etc. When the

nuts are ready to pick the so-called cases or "burs" will open. In a cluster where one or two do not they should be thrown out. Where possible the nuts should be picked by hand as in this way very few of the fruit buds for the next season's crops are injured. There should be but one picking. In the taller trees it will of course be necessary to shake or beat the limbs. In climbing among the branches there is danger of splitting the limbs which should be avoided. It takes about two weeks for the nuts to cure after picking. To facilitate the curing the nuts should be spread out two or three inches deep on trays in a shed.

GRADING. Each variety should be packed separately. With the seedling nuts where there is a diversity in size they should be graded by the use of screens. As stated before the seedling nuts are colored and polished. This should not be practiced with the standard nut. Where the nuts are mixed and it is desirable to give them a good appearance in the market they can be placed in a barrel with dry sand, the barrel being rotated until the nuts are polished.

In any market the packs containing mixed varieties or single varieties of any fruits, vegetables, or nuts, which are not evenly graded, bring minimum prices. The apple, pear, and orange growers have learned the lesson of proper grading, and packing. The same will apply to the marketing of pecans. To the average man a pecan is a pecan, regardless of size, shape or color. This being due to the fact that hardly one man in 2,000 in the United States has ever eaten a standard Southern grown pecan. In Chicago the market recognizes certain varieties of pecans, but up to the present has not discriminated as to the standardization of the leading varieties. There is a wide variation in the size of the standard varieties in different localities. Wholesale

dealers find it impossible to secure uniformity, even in single varieties, which indicates that the time will soon come when standards and regulations will be formulated as is now practiced in the Apple Growers' Association.

MARKETING. The seedling nuts from Texas are generally shipped in sacks but these are unsatisfactory as they do not thoroughly protect the nuts. The best plan is to use solid wooden boxes made to contain a definite number of pounds of nuts. A convenient size would be a box holding ten pounds. In filling the boxes with nuts care should be taken to have them shaken occasionally so that the box can be filled solid. At present the finer nuts fill a private market and these packages vary in weight from one to five pounds. Paste-board boxes can be safely sent by express when wrapped in heavy wrapping paper and tied securely.

The grower's name should be stamped on the package. With the proper package and the same standard of excellence in the variety of nuts shipped each year the grower is assured of a steady customer and generally the reputation of the grower is passed on to other prospective customers and so the grower's trade will increase.

As previously stated private orders consume the present supply of standard nuts and will continue to do so for some time. The varieties bringing from fifty cents to a dollar per pound are found on the tables of some of the first-class hotels in the East. However the time is not far distant when a portion of the larger cities will learn the value of the large nuts and keep the growers busy supplying this market. When the home market is supplied we still have the European market open. The pecan is a distinctly American product and gives us a world market.

There will always be two market classes, namely, the wealthy buyers and those of moderate means. A certain standard of excellence will always find the former market profitable. The time is not far distant when the general public will be willing to pay a fair price for the better grade of nuts.

Mr. T. W. Oliver, of Montgomery, the past season received thirty cents per pound, wholesale and fifty cents per pound retail. The variety of nuts that he is growing is the Stuart. Although some of the better nuts are bringing the growers as high as a dollar and a dollar and a half per pound the prices will not prevail outside of the private market. However, there will be a good profit if the nuts sell at only twenty cents a pound.

Most of the varieties can be stored for a considerable time without deteriorating. Pecans for seed purposes where the grower is experimenting to establish new varieties, generally bring fancy prices. The seedling Texas pecans bring from eight to fifteen cents a pound. The pecans grown locally generally sell at from fifteen to twenty cents a pound.

TIME OF BEARING AND YIELD.

With the seedling tree especially we find that they are often intermittent bearers, i. e., irregular bearers. In Texas the main crop is heavy about every third year. The standard varieties often have better years than others. There are several reasons for this. Frosts may occur at the blooming period, also heavy rains and high humidity may prevail at the same time. If the trees pass through a drought all the energy is necessarily directed to the maturing of the present crop. The formation of buds for the next season's crop must suffer. The pecan demands a constant, regular supply of moisture

and without it we must expect irregular crops. Some years the insect pests are more troublesome than others.

Ninety per cent of the trees which fail to mature profitable and regular crops may be traced to the selection of improper varieties, to trees improperly planted, and to the trees being improperly cared for after planting.

Judge Miller, of Talladega, Ala., planted a Schley tree in his yard and the third year it bore 80 nuts. When four years old it bore 200 nuts. The tree was between 3 and 4 feet high when set out.

A Mississippi grower has found that a tree averages the following yields:

6 year old	-----	3 lbs.
8 year old	-----	11 lbs.
10 year old	-----	25 lbs.
12 year old	-----	45 lbs.
14 year old	-----	65 lbs.
15 year old	-----	80 lbs.
20 year old	-----	125 lbs.
25 year old	-----	150-300 lbs.

The pecan will come into bearing as early as the apple orchard and remain in bearing twice as long.

The question is often asked, "How long must I wait before my pecan orchard will bear a commercial crop?" It will take from 8 to 12 years. There is a Mobile tree on record which produced 20 1-2 lbs. the fifth year after planting. Much depends on the variety, the soil and its treatment and the management of the orchard.

A tree from 4 to 6 years old comes into bearing and from 8 to 10 years will be profitable and between the ages of 12 to 15 years should bring a net income of \$100

per acre. Ten to twenty-five acres of pecans should produce a good living. One or two hundred trees properly cared for and planted on congenial soil will be far more profitable than ten times as many trees not properly cared for.

Mr. J. B. Wight, of Cairo, Ga., planted a Frotscher in 1892 and in its sixth year bore 10 1-2 lbs., 10th year 45 lbs. and in 1908 bore 169 lbs. There is generally considerable profit in selling the bud wood of these prolific trees. The regular crop from the above tree wholesaled at 50 cents per pound and retailed at 75 cents.

Prof. H. K. Miller of Monticello, Fla., owns a Schley which bore in its fifth year 60 nuts, the seventh 5 lbs., and practically 15 pounds in the eighth year. He states that one eight year Delmas bore eight pounds of nuts and in the ninth year bore 15 pounds.

Budded and grafted trees have made the following record of yield:

5th year	-----	10 lbs.
6th year	-----	15 lbs.
7th year	-----	25 lbs.
10th year	-----	50 to 100 lbs.

CRACKING THE PECAN.

For table use the pecan is readily cracked and the kernels extracted with the use of the common two handled cracker which can be secured at the stores for 25 and 30 cents a piece. By grasping the pecan firmly in the hand and crunching down on the ends of the pecan snip off these ends first. Then place the nut longitudinally in the cracker and just press sufficiently to crack the shell. Then turn the nut and crack it once more. When this is practiced a few times there will be little

difficulty in removing the kernels either whole or in halves. For candies, cake, etc., the housewife will find this method a great time saver. In snipping off the ends care should be taken not to endeavor to remove too much shell as in a well filled nut the ends of the kernel will be broken, spoiling the appearance of them. It is better to take a little time and not try to get into the tempting kernel too quickly. Cracking the nuts in the hands or placing them in the cracker either side-wise or length-wise generally results in picking out irregular shaped pieces which taste just as good but are unfit for the candies.

A well filled nut is less apt to retain the "peel" which tastes so bitter. This clings to the sutures of the poorly filled nut and helps to score against it.

There are numerous devices for extracting the kernels of pecans, one of which is a small vice with cup shaped caps. The pressure on the nut generally splits the shell in the center and the two halves are pulled apart. With some varieties this device works very well.

THE PECAN AS AN ORNAMENTAL TREE.

The pecan tree has a habit of growth which clearly distinguishes it from other trees. It attains considerable size, lives for a number of years, is symmetrical, of clean upright habit and with a clean straight trunk. The branches are strong and grow well up from the ground. The forking is wonderfully graceful and even in winter the sharp lines of the trees are prettily silhouetted against the sky. In summer the compound leaves are so light and airy that grass can readily be grown under the trees. Even in a light breeze the leaves tremble and wave while others fail to notice the slightest air current. This movement of the leaves tends to console the

person suffering from heat as he realizes that some air is moving.

The merits of the pecan tree in the home yard are unquestioned. It affords not only pleasure to the children who love to climb but furnishes an abundance of delicious and nourishing food for them in the fall. The leaves do not drop until very late in the season and make a very small quantity of litter.

As a street tree the pecan should prove very valuable. As stated before it is an erect and handsome grower and makes a more pleasing shade tree than many we now find in such a bad state of decay. For shade the seedling trees should be planted at least 50 feet apart. When these mature, there is danger of course of their being injured by boys trying to knock off the nuts. With the rapid strides now being taken to inspire "young America" with a love for the beautiful, it is doubtful if the thoughtless boy will be a great menace to even nut trees for shade, in ten to fifteen years to come.

Every school yard in Alabama should have pecans growing in it. Here again the seedling trees serve the purpose as the object in view is shade, not commercialism.

REASONS FOR PLANTING PECAN TREES.

A good plantation is a most valuable piece of property to either transfer or to hand down to posterity. The man who plants the trees may not have in consideration their commercial value, but the prospective buyer of the property is apt to and the presence of the trees add hundreds of dollars to the valuation of the farm or plantation.

Practically every Alabama farmer is planting cotton and expects to keep up the growing of cotton until the boll weevil or some other pest drives him out of it. Why should he not plant an acre or two in pecans and continue to raise cotton under the young trees until they come into bearing? Cultivating his cotton will cultivate his trees. He can well afford to cease cotton growing in that acre of pecans in eight or ten years and from then on he will have a permanent income from the pecans without the annual labor the cotton requires. This pecan orchard tends to settle the farmer who is wont to travel about. He sees in a bearing orchard some income for his declining years. The great difficulty with the farmer is to impress him with the fact that it is not necessary to wait such a long time as he generally believes is required for the pecans to come into bearing. In the majority of recent home pecan plantings it has been the seed and not the budded or grafted tree that goes into the ground. Quick results cannot be expected from seedling trees.

The crop takes care of itself as well as any. It is easy to ship and has very little risk of loss when placed with the transportation company.

PECANS AS AN INVESTMENT.

Mr. J. B. Wight, of Cairo Ga., in a paper read before the National Nut Growers' Association at Chattanooga in 1908, stated, "There is money to be made in pecan growing when judiciously conducted in a business-like manner. I do not know a more attractive field in the realm of Horticulture. The farmer or land owner living anywhere in the pecan belt who fails to grow enough nuts for his own use and also some for market, is neglecting his exceptional opportunity----the pecan propo-

sition when properly handled is in itself attractive enough without any extra touches of rainbow coloring to set off the picture.”

“Are pecan investments safe? Is gold mining a paying proposition? That depends. Thousands may be made in each and thousands lost. What will be the result in any particular case? Returning to a former figure, the man at the wheel, the personnel of the crew, and the seas traversed determine all.”

The above places pecan growing fairly and squarely before the planter. It is more often the man who plants and cares for the trees that decides success than the trees, soil, etc. There is much exaggeration by speculators concerning the profits in pecan raising. Many of the recently formed companies are organized by men of integrity. At the same time there are others, as in all industries, who are after “all there is in it.” The public simply invests the money and the directors fatten their pockets. Among the former companies will be found men whose faith in the business adds a great deal to its stability.

Figures taken from Mr. Wight’s paper which have been estimated and stated as “prospective rather than actual, so far as the income is concerned,” show that good land set in vigorous budded or grafted trees at the end of the first year is worth \$100.00 an acre.

At the end of five years----\$300.00 per acre.

At the end of ten years-----\$550.00 per acre.

At the end of fifteen years--\$800.00 per acre.

Net income per acre at end of 10th year, 8 per cent. or
\$44.00.

Net income per acre, end of 15th year, 8 per cent. or
\$64.00.

Net income per acre, end of 20th year, 8 per cent. or \$85.00.

The value of the last being per acre \$1,050.00.

As Mr. Wight states, the above figures are conservative and can be expected only when all conditions of orchard management are properly and carefully watched.

PECAN INSECTS.

Prof. H. A. Gossard, formerly State Entomologist of Florida, in Bulletin No. 75 issued from that Station in 1905 gives a full description of the more important insects affecting the pecan.

Another valuable work on "Insects Injurious to Pecans" has been prepared by Professor Glenn W. Herrick, Bulletin No. 86 of the Mississippi Experiment Station.

Among the more important insects mentioned and described by the above authors are the following:

PECAN BUD MOTH. (*Proteoptery deludana*, Clemens.)

According to Prof. Chittenden of the Bureau of Entomology there are more inquiries concerning this insect than any other attacking the pecan. The caterpillars are usually yellowish or pale greenish, with dark heads and are generally known as bud worms. The adult stage is not well known to Entomologists.

The insect feeds on buds, tender twigs and leaves, according to the season and there are two or three gener-

Much of the above material has been noted by Prof. F. H. Chittenden, U. S. Department of Agriculture.

ations each season. Sometimes they roll the leaves into tubes of regular sizes.

Treatment. Spray with arsenate of lead when it first appears in May. The spray should be applied before the insect can conceal itself in the buds. The "man next door" should also be induced to co-operate in the spraying. As the larvae also attacks walnuts and other trees these should also be sprayed. With plenty of time at hand Prof. Herrick's method of daily inspection of buds and the removal of insects on a pin point is efficient. The lime-sulphur wash promises to control this insect if applied during the dormant period, from December to a few weeks before the buds start.

PECAN GIRDLER. (*Oncideres texana*.)

There are two other "girdlers" or "pruners" but this one is important especially in the South. Twigs affected by this insect appear to have been sawed, the outer portion remains hanging on the tree for some time as it is on this that the female beetle deposits her eggs and when they fall the process of pupation commences. As the hickory girdler has similar habits both can be controlled by picking up the fallen branches and pruning those which hang on the tree, from such food trees as pecan, hickory and persimmon, and burning them during the winter. There have been several inquiries sent into the Experiment Station at Auburn concerning this pest.

PECAN CASE-BEARER. (*Acrobasis nubellela*, Riley.)

There have been two species of these found on pecans. One is often called the bud-worm as it attacks the leaf and flower buds. Its larva constructs a tube about its

body consisting of its excrement, bark, etc., this material being joined together by silken threads. It carries the case with it, an aperture being left through which the insect pushes its head to feed.

Treatment. Prof. Gossard recommends spraying with lime-sulphur wash to which an arsenical poison has been added, applied in March and April, when the buds are opening.

The second species constructs cigar shaped cases and no doubt have often been observed on the limbs or trunks of trees. These have been found on the trees in the orchard at Auburn. It should be treated as the preceding.

ROOT BORERS.

These various grubs feed on dead or dying wood and two beetles of the genera *Malodon* and *Prionus* have been found on the pecan roots. Care should be taken to have the pecan orchard clear of stumps.

APPLE TWIG BORER. (*Amphicerus bicaudatus*, Say.)

This insect breeds generally in dying wood and the beetles bore into the twigs, usually about a bud or leaf scar, and continue straight to the center, where they form a cylindrical burrow an inch or more in length.

Treatment. Cut the infected twig below the point of attack and burn the cut portion immediately.

PECAN TREE BORER. (*Sesia scitula*, Harris.)

This insect resembles the peach tree borer. It very seldom attacks trees less than two inches in diameter, and seldom penetrates deeper than the sapwood. The

borers generally enter the trees where they have been injured or budded.

Treatment. Cover denuded portions of the bark with grafting wax and put some around the buds also, just before the moths begin their flight. They should be gouged out with a knife when possible and a stiff wire run into the hole is also effective.

FALL WEB WORM. (*Hypantria cunea*, Dru.)

The brownish webs which appear during the summer are perhaps better known than the larvae which do the damage. In one large orchard the writer has visited a man goes among the trees on horseback and clips off the webs each week or so and destroys them. A ball of cotton waste wrapped to the end of a long pole, saturated with kerosene and ignited will destroy the webs. The arsenical sprays are effective.

PECAN HUSK WORM. (Gather infested nuts and destroy them.)

WALNUT CURCULIO. (Early spray of Paris Green Hogs will destroy the fallen nuts.)

The above list of insects should not discourage the prospective planter as the pecan, relatively speaking, is much freer from pests than most of our fruits. There is no insect affecting the trees as bad as the San Jose Scale which should be very consoling to the peach grower.

PECAN DISEASES.

Scab. Some varieties are more susceptible than others and when it shows up badly in an orchard the trees should be top-worked to a more resistant variety.

Scab causes circular black spots on the leaves which fuse together. It also attacks the young twigs. It appears to attack the trees worse which are in low ground and is most injurious during very wet seasons. There has not been enough work done to determine the best dates for spraying. The difficulty arises in the irregular blooming causing several sprayings to be necessary in a mixed orchard. As there are some varieties more susceptible than others in different locations it is hoped that the occurrence of this will be noted to enable further investigation and the information sent either to the Horticultural or Botanical Departments at the Experiment Station at Auburn.

WINTER KILLING.

Trees which have a thick rough bark generally escape from this. It has been avoided by planting seedlings in bottoms and top working them when 5 inches in diameter. Four-inch trees do not winter kill. In trees in which the sap rises first there is the greater danger.

FROZEN SAP BLIGHT.

This term has been applied to the injury done by frost to one year grafts. Generally a dead spot appears in the trunk of the trees. Three and five year trees are killed by this freezing. These four to six inches in diameter generally stay dormant. In grafted trees buds have been successfully inserted about one foot above the ground which is above the spot.

ROSETTE.

This is undoubtedly the result of an unbalanced condition of the tree which is not able to properly assimilate its food. It is not a bacterial disease as plant

pathologists have never been able to inoculate the germs into an uninfested tree successfully. It is found in both wild or native trees and the budded and grafted varieties. It has occurred recently in the Russell tree on the Experiment Station grounds.

In appearance it resembles a miniature shrub rising from the branch of the tree. The stems and leaves in the cluster are small and delicate.

A double handful of Copper Sulphate applied about the base of a tree one inch in diameter has corrected the trouble in one instance and further trials should be given this treatment.

VARIETIES RECOMMENDED.

The following descriptions have been made by the Bureau of Plant Industry, Washington, D. C., except as noted.

ALLEY.

The original tree of this variety was grown by Mrs. C. H. Alley, of Scranton, Miss., from a pecan of unknown variety presented to her by the late Col. R. Seal, of Mississippi, in 1871. This nut she planted in a box the same fall, transplanting the young seedling that resulted therefrom to its present location in her garden in 1872. The tree began bearing at the age of about nine years and has the reputation of being a steady and prolific bearer. The variety was first propagated by Mr. F. H. Lewis, of Scranton, who set buds and grafts of it in 1896, and since that time it has been considerably disseminated by him and others under the name Alley. The original tree bore about 200 pounds of nuts in 1905, and had a fair crop when the storm of September, 1906, occurred. This destroyed a considerable portion of the

crop and broke several large branches from the tree, though not enough to permanently injure it.

DESCRIPTION.

Size medium, averaging 60 to 80 nuts per pound; form, oblong to ovate conical, with moderately sharp quadrangular apex; color, bright yellowish brown, with rather long and conspicuous black markings; shell brittle, thin; partitions very thin; cracking quality excellent; kernel plump and well filled out, though deeply grooved and considerably undulated and irregularly indented; kernel bright, brownish straw color; texture firm and fine grained; flavor sweet, and free from astringence; quality very good.

The tree is moderately strong, though rather slender, grower and is reported to be productive in several localities where it has been top-worked during the past five or six years.

The nut is a little larger than the Schley and about the size of the Stuart. It appears to be prolific and an early bearer in Baldwin county. It is a good keeper.

CENTENNIAL.

So far as ascertained, the Centennial is the first variety of pecan that was successfully propagated by budding or grafting. It was also the first variety planted in commercial orchard form, with a definite view to producing nuts for sale, and one of the first three to be catalogued and offered for sale.

Two of the earliest grafted Centennial trees, above referred to, are still standing at Oak Alley, La. They were thrifty, productive, and in fine condition when inspected by the writer* in the autumn of 1902. The date of their grafting by the slave Antoine (1846 or 1847), under Doctor Colcomb's direction, marks the beginning of modern pecan culture.

*Wm. A. Taylor, United States Department of Agriculture.

DESCRIPTION.

Size large, average nuts running about 45 to 50 to the pound; form long, compressed cylindrical, gradually tapering to the wedge-shaped apex; base conical; color bright grayish brown with rather scanty purplish splashes toward the apex; shell rather thick, partitions thin; cracking quality medium; kernel clear, reddish yellow, deeply and narrowly grooved, but quite smooth and separating easily from the shell; plump, solid; of delicate texture and flavor, quality very good.

The Centennial tree is a rather slender grower with grayish green young wood sprinkled with small light dots. It becomes pendulous as it attains age, and is on this account one of the handsomest varieties for parks or large lawns. It is slow to come into bearing, but appears to be a fairly regular cropper after attaining an age of above 15 years from bud or graft.

It is not being propagated to any extent at present.

COLUMBIAN.

(PRIDE OF THE COAST.)

This variety has been discarded. It is a poor bearer and has a thick shell. It is also a poor filler. However, it is a favorite specimen for the unscrupulous tree agent as its size appeals to the uninformed.

CURTIS.

(Synonym: Curtis No. 2.)

The original tree of this variety was grown by Dr. J. B. Curtis, of Orange Heights, Fla., from a nut of the "Turkey Egg" pecan obtained from Arthur Brown, of Bagdad, Fla., in 1886. It was first propagated by Dr. Curtis in 1896, and was disseminated by him somewhat later. The original tree, though heavily cut for cions, yielded 80 pounds of nuts in 1905.

DESCRIPTION.

Size medium, 60 to 70 nuts per pound; form ovate conical, compressed, with a sharp pointed base and an inclination to curve near apex; color bright, with very few black stripes, but sparsely stippled with black over most of the surface; shell very thin and brittle; partitions thin; cracking quality good; kernel very plump and thick, free from indentation other than the narrow grooves, which are of medium depth; color bright, except brownish stippling that perceptibly darkens the tint in some specimens; texture firm, crisp; flavor sweet and rich; quality very good.

The tree is reported to be slender and rather pendulous in habit of growth and regularly productive. The variety is of special promise for Florida growers, as it is one of the few sorts that have originated and been thoroughly tested in that State. It is reported to be rather hard to propagate, the wood being slender and the buds not numerous. Doctor Curtis reports it free from attack by the bud worm where such sorts as Rome and Centennial are badly damaged by it.

One of the best table nuts. It is reported free from Rosette. One of the best keepers. The variety should be tested in Alabama.

DELMAS.

The original Delmas pecan tree was grown from a nut planted by Mr. A. G. Delmas at his place at Scranton, Miss., about 1877. It was propagated in a limited way by Mr. Delmas about 1890 by grafting both in nursery and orchard. Its general dissemination, however, appears to have occurred in connection with the "Schley" about 1902, mixed cions of the two varieties received from Mr. Delmas having been grafted in the Pierson nursery, at Monticello, Fla., and disseminated under the name Schley before the admixture was discovered. The wood of the Delmas is so much stouter and more erect

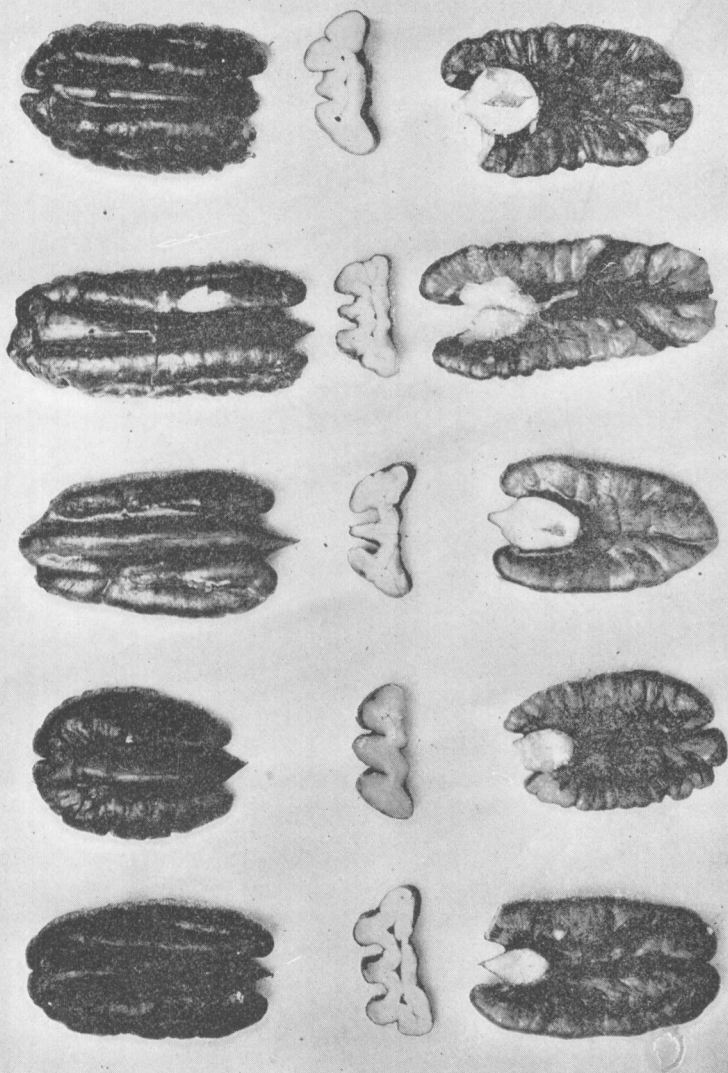


Plate VIII. This shows kernels from the following nuts: Reading from top to bottom, Stuart*, Centennial, VanDeman*, Russell* and Pabst*. Actual size. *Taken from Experiment Station nuts. (Photo by the author.)

than that of the Schley variety that little difficulty is experienced in separating them even in the nursery row.

DESCRIPTION.

Size large to very large, averaging 40 to 50 nuts per pound; form oblong ovate, rather pointed at base and rather bluntly quadrangular at apex; and distinctly marked by four conspicuous ridges extending from the apex nearly to the base of the nut; color grayish brownish, sparingly marked with black; shell rather thick, with partitions soft but corky; cracking quality good; kernel plump and well filled, grooves rather narrow, but shallow, and surface undulating; kernel bright straw color, very attractive; texture rather soft and open; flavor sweet, pleasant; quality good.

The tree is a strong grower, of erect and roundish head, very distinct from the Schley, with which it has been somewhat mixed in nurseries and orchards. It is productive and promising from the lower pecan districts, such as the Gulf Coast region, where it originated.

Tendency to scab in some localities. It is recommended for commercial orchards owing to its cracking quality and size. It is rather difficult to propagate. It is a good bearer—early and is showing up well in Baldwin county.

DEWEY.

Medium to large, ovate pointed; color dull gray and marked with slashes of purplish brown; base rounded; apex sharp; shell brittle and thin; cracking quality very good; partitions thin; kernel full, plump, smooth, light straw colored with narrow sutures of medium depth; texture firm and solid; flavor sweet, rich, good; quality very good.*

This nut originated a few miles south of Monticello, Fla. It is a very promising variety. The growth of the tree in the nursery and orchard is not entirely satisfactory.

*Described by H. H. Hume.

FROTSCHER.

(Synonyms: Eggshell, Frotscher's Eggshell, Oliver, Majestic.)

This variety was originated by the late Oscar Oliver in his garden beside the Bayou Teche at Olivier, Iberia Parish, La. The original tree, now owned by H. J. Pharr, is still healthy, vigorous, and productive. Its exact age is not known, but the indications are that it was planted subsequent to 1860. It appears to have been first propagated about 1882 by William Nelson, and first catalogued by the late Richard Frotscher as "Frotscher's Eggshell," in 1885. Locally it is still known as the "Olivier" pecan, in honor of its originator.

DESCRIPTION.

Size large, averaging about 45 to 50 nuts per pound; form cylindrical oval with broad, rounded base and blunt quadrangular apex; suture rather indistinct; color bright yellowish brown, with scattered purplish black splashes toward apex; shell thin to very thin, with thin partitions; cracking quality excellent; kernel brownish yellow, often shrunken, showing dark veins even in the fresh nuts; texture rather dry and coarse; flavor pleasant; quality medium.

The tree of Frotscher is a strong grower, of broadly spreading and sprawling habit, the young wood bright brownish green in color and conspicuously dotted. The variety is precocious and productive, but the faulty character of many of its kernels and their stale appearance, even when perfectly fresh from the tree, materially lessen its value as a commercial variety.

The tree characters of Frotscher are quite clearly reproduced in its seedlings, and, as many of these have

*Described by H. H. Hume.

been planted throughout the South, there is much confusion regarding the variety. It has been successfully planted in many different localities.

MOBILE.

This variety undoubtedly originated at Bayou Labatre, Ala., about 1887, and was first propagated in 1900. The tree is a very heavy bearer and clusters of eight nuts are often found. It develops faulty kernels in the vicinity of the parent tree and should not be planted too heavily without further trial. The nuts weigh in some cases as high as 24 to the pound.

Large, long, slender, slightly constricted, near the middle, pointed sharply at both base and apex, the latter rather long; color bright light brown, with dark purplish black markings; shell thin, easily cracked; partitions thin; kernel slender, under some conditions not well filled, sutures deep; color light uniform yellow; texture fine grained, crisp, flavor sweet and nutty, quality good.*

MONEY-MAKER.*

Size medium, ovate oblong; light yellowish brown with a few purplish brown marks about the apex; base rounded; apex abruptly rounded, slightly wedged; shell of medium thickness; partitions medium thick, corky; cracking quality good; kernel full, plump, broadly oval; sutures straight, broad, shallow, texture firm, solid; sweet, good; quality very good.

The principal objection to this variety is its hard shell. The size of the nut varies considerably in different localities. It is considered a good bearer.

PABST.

The Pabst is a splendid bearer and was first propagated by Mr. Charles E. Pabst, of Ocean Springs, Miss., in 1890.

The nut is of large size, averaging about 45 to 55 nuts per pound; form short, cylindrical, with a very blunt, broadly grooved apex; color dull gray, heavily splashed with purplish black; shell thick, hard; partitions rather thick, cracking quality medium; kernel plump, smooth with broad grooved, bright straw color; texture fine; flavor delicate; quality very good.

This variety is recommended not only for the pecan belt but for the more northern plantings.

The tree is very sturdy, upright, with stocky gray green young wood, sparsely sprinkled with large dots.

The Pabst has been quite generally planted in Alabama and adapts itself to a wide range of territory. Its rather thick shell is its only fault.

Recommended by the author.

RUSSELL.

The Russell pecan tree, like all others at Ocean Springs, Miss., was grown from planted nuts, that locality being below the native range of the species in that section. This tree was one of a lot of seedlings grown by the late Col. W. R. Stuart, of Ocean Springs, Miss. Mr. Charles E. Pabst first propagated it in 1894. The tree is a fairly regular bearer, averaging about 150 pounds of nuts per annum, and, though receiving little care or attention, is a healthy, vigorous tree at present writing. It has attained a high local reputation on account of its exceptionally thin shell and regularity of bearing. Rather late in maturing its crop in many places.

DESCRIPTION.

Size medium to large, 55 to 60 nuts per pound; form compressed, oval, tapering to a long, sharp apex and a rather pointed base; color grayish brown, with narrow splashes and spatters of purplish black; shell very thin, partitions very thin and fragile, cracking quality excellent; kernel broadly grooved, rather dark straw color, often

lacking in plumpness and defective at tip, texture rather dry, flavor pleasant, quality good.

The tree is rather pendulous in habit, with slender, dark, conspicuously dotted young wood, bearing regularly and well, so far as tested.

SCHLEY.

This variety is a seedling of the Stuart. It was grown by Mr. A. G. Delmas of Scranton, Miss. The seed was planted in 1881 and the original Schley tree still stands on his grounds. Sometimes this nut is called the "Admiral Schley."

It is medium sized to large, quite variable, ranging from 45 to 69 nuts per pound; oblong conic to long obvate, with conical apex; color golden brown with a few purple splashes toward apex; shell very thin, partitions thin and brittle, cracking very easily; kernel long, slender, bright, rather deeply and narrowly grooved, but releasing so easily that the entire kernel can readily be removed without mutilation; texture fine grained; flavor delicate, sweet rich; quality very good.

The slenderness of the kernel is objectionable from the confectioner's standpoint. The crop is quite variable as to quantity and the nuts vary considerably in size and form. The original tree which is twenty-five years old bore 125 pounds of nuts in 1905. It shows great promise and should be thoroughly tested in districts bordering the Gulf of Mexico.

There is an occasional tendency for the nuts to get out of shape and in extremely dry seasons the nuts often curl. However, faulty nuts are never found.

Recommended for Alabama.

STUART.

(Synonym: Castanera.)

The original tree of this which is generally considered the most widely successful pecan variety yet introduced and tested, stood in a garden at Pascagoula, Miss., now owned by Captain E. Castanera. It is supposed to have been brought from Mobile, Ala., and planted in 1874. It was first propagated by Mr. A. G. Delmas, of Scranton, Mss., who cut cions in 1886. Out of sixty grafts inserted he secured one tree which still survives in his garden. Mr. Kellar then associated with Col. W. R. Stuart of Ocean Springs, Miss., secured cions from the tree about 1890 from which trees were propagated by them in their nursery. About 1892 Colonel Stuart offered these for sale under the name Stuart. It is undoubtedly one of the most widely disseminated varieties throughout the South.

Size large to very large, averaging about 40 to 50 nuts per pound; form cylindrical, slightly compressed, rather blunt apex and rounded base; color brownish gray, splashed and dotted with purplish black; shell moderately thin; partitions thin and fragile; cracking quality very good; kernel bright, moderately smooth, plump, rather narrowly grooved; texture firm, fine grained, solid; flavor delicate, rich; quality very good.

The Stuart is generally uniform in size and quite plump but the shell is rather thick and it is difficult to remove the kernels without mutilating them.* This fact has caused some of the nurserymen to restrict their stock of this variety.

* The Bureau of Plant Industry at Washington treats such nuts as Stuart as follows where a number are to be cracked. Allow them to soak in water 10 to 12 hours. Dry them under an electric fan for about 15 minutes. This toughens up the kernels and about 90% of them can be removed whole.

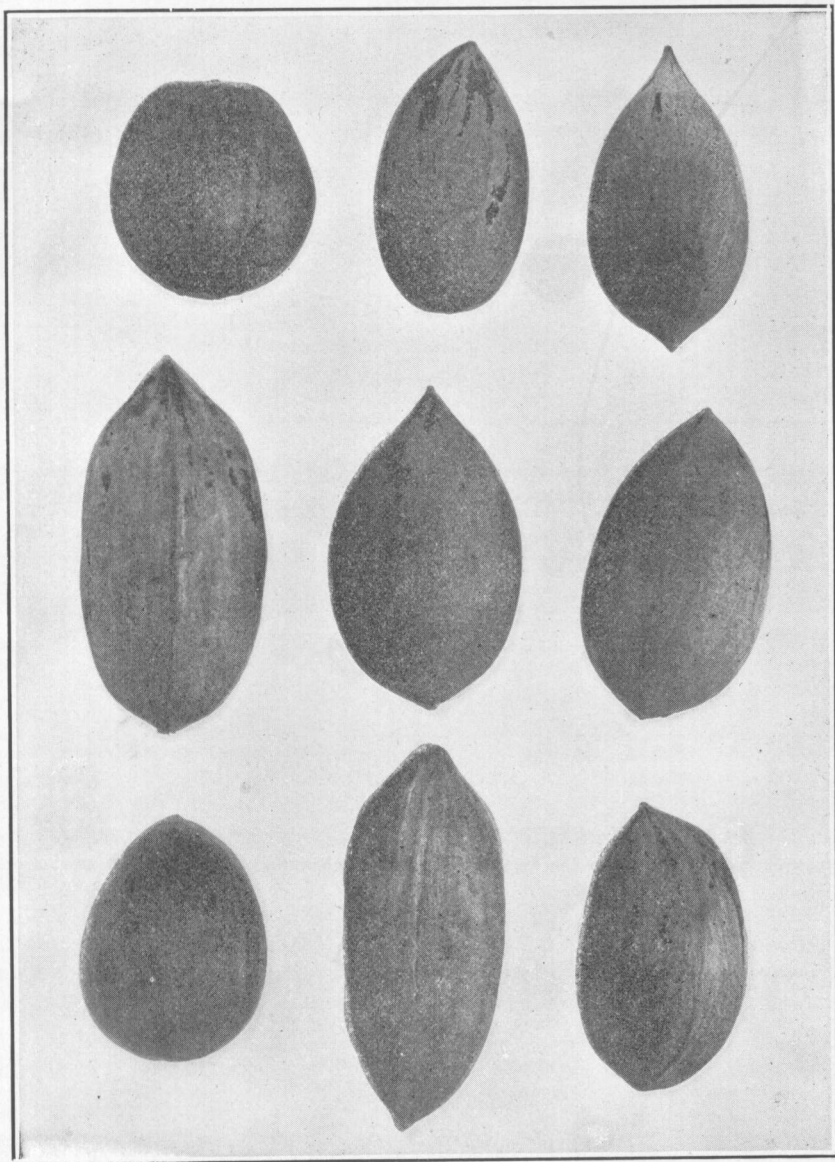


Plate IX. The varieties shown above reading from left to right are as follows: Top row, Halbert, Teche, Curtis. Middle row, Nelson, Delmas, Alley. Bottom row, Moneymaker, Mobile and Capitol. (Photo by Author.)

A strong point in favor of the Stuart is the fact that it puts out its foliage late in the spring.

The tree of Stuart is a strong, upright, spreading grower, with moderately stout young wood, grayish green in color, rather sparsely dotted with oval dots. It is proving regularly and abundantly productive in most localities where it has been fruited and is apparently succeeding over a wider climatic range than any other sort thus far tested.

Recommended for planting in Alabama.

SUCCESS.

The original tree of this variety is standing at Ocean Springs, Mississippi. Mr. Theo. Bechtel was the propagator of the variety which was introduced by him in 1903.

DESCRIPTION.

Size large, running 45 to 50 nuts per pound; form oblong, with rather sharply conical base and blunt apex; color grayish brown, with rather heavy purplish stripes, especially toward the apex; shell of medium thickness, with moderately thick partitions and fair cracking quality; kernel roundish oval, plump, bright, somewhat flaky in texture, but of pleasant flavor and very good quality.

It resembles Pabst especially in habit of growth and at the apex of nuts.

Recommended for planting in the lower portion of the State. It bears at an early age and is a vigorous strong grower. Its tendency to put out its foliage a little late in the spring is a strong point in its favor.

TAYLOR.

The original tree of this variety is supposed to have been grown from a nut planted by the brother of the

present owner, Miss Lula Taylor, of Handsboro, Miss., about 1885. The variety was first propagated by W. F. Heikes, of Huntsville, Ala., at his Biloxi, Miss., nursery, about 1901, and, having been named in honor of its owner, was introduced by him in 1902. Nuts of it were examined and passed upon by the committee of nomenclature and standards of the National Nut Growers' Association at Scranton, Miss., in November, 1906, at which time it received a grade of 86.06 out of a possible 100.

The original tree of the Taylor is now about 60 feet tall, with a spread of 45 to 50 feet, and a trunk diameter of about 18 inches.

DESCRIPTION.

Form long, rather slender, constricted near middle, slightly curved, with pointed base and long, sharp apex; color bright yellowish brown, with few and narrow black markings irregularly placed; size rather large, 60 to 65 per pound; shell thin, with thin and soft partitions, cracking very easily; kernel long, slender, rather deeply grooved, but plump, smooth, and releasing the shell easily; color bright yellowish; texture very fine grained and crisp; flavor sweet, nutty, free from astringence; quality very good.

Though not yet fruited, so far as known, outside of the locality of its origin in southern Mississippi, its numerous desirable qualities indicate that it is worthy of testing where other Gulf coast varieties succeed.

TECHE.

(Synonyms: "Frotscher No. 2;" "Duplicate Frotscher;" "Fake Frotscher;" "Spurious Frotscher.")

Among the budded trees of the Frotscher pecan, it has recently been discovered that there were trees of at least one other variety quite closely resembling it in

wood and habit growth, but yielding a smaller and more conical nut. This sort, which reached a number of growers, including Mr. J. B. Wight, of Cairo, Ga., and Dr. J. B. Curtis, of Orange Heights, Fla., in this way has proved to be of sufficient merit to entitle it to a distinctive name. The place of its origin is not known. Acting on this supposition, the committee on nomenclature and standards of the National Nut Growers' Association, at its annual meeting at Scranton, Miss., in November, 1906, named the variety "Teche" to distinguish it from the Frotscher. As there appears to be good reason to suppose that several other varieties closely resembling Frotscher have been and still are mixed with that variety in many orchards and nurseries, the name Teche should not be indiscriminately applied to all the "spurious" Frotschers, but should be restricted in its application to the one which is here described from specimens grown by Mr. Wight on tree obtained from the Nelson nursery in 1895.

DESCRIPTION.

Size medium to large, averaging 55 to 65 nuts per pound; form long oval, compressed, tapering gradually, with the smaller specimens slightly curved near apex; color bright, light, with few broken black stripes; shell comparatively thin, but thicker than Frotscher, with which it was disseminated through error; partitions thin and soft; cracking quality excellent; kernel bright and free from the objectionable brownish veining of the Frotscher, plump and uniformly well filled, with shallow grooves; texture of meat firm, fine grained, solid, creamy in color; flavor delicate, rich; quality very good.

The tree is of more slender and upright habit of growth than Frotscher, and is reported to be fully as productive as that variety in Georgia and Florida. It is worthy of trial wherever that variety succeeds.

This variety should be given a fair trial in Alabama. It is prolific and comes into bearing early.

VAN DEMAN.

(Synonyms: Bourgeois, Dumminie Mire, Mire; Mere and Meyer erroneously; Paragon in part, Southern Beauty.)

The original tree of this variety was grown from a nut planted by the late Dumminie Mire, of Union, St. James Parish, La., in 1836. About 1877 Emil Bourgeois cut cions from it for propagation. Eleven out of twenty-two he set as top grafts succeeded. When these grafts began bearing he commenced propagating young trees for planting in orchard form and for sale to nearby planters, among whom it is known as the "Dumminie Mire" pecan to this date. A number of nuts and some cions from these grafted trees having passed into the hands of Col. W. R. Stuart, of Ocean Springs, Miss., about 1890 he renamed the variety VanDeman in honor of Prof. H. E. Van Deman, then Pomologist of the Department of Agriculture. Since 1892 it has been widely advertised and distributed under this name.

Mr. W. A. Taylor, now of the Department of Agriculture, personally inspected the original trees at Union Post Office, La., in 1902 and states that it was a beautiful, thrifty tree, measuring seven feet six inches in circumference and bearing from 200 to 300 pounds of nuts per annum.

Size large to very large, averaging from 45 to 55 nuts per pound; form long, compressed, with a rather sharp base and a long, sharp apex, often slightly curved; color rather dark, reddish brown; slightly splashed with purplish black, especially toward apex; shell moderately thin, partitions thick but brittle; cracking quality fair; kernel long, narrowly grooved, generally plump, except at tip; color bright, clean, attractive, rich; quality very good.

The tree is of a strong moderately erect habit, with grayish-green young wood showing in conspicuous dots, and is a regular and abundant bearer in the locality of its origin. It does not thus far appear to be as productive elsewhere nor to fill out its kernels as well.

The above descriptions cover most of the nuts known to be growing in Alabama. With further tests perhaps some will be thrown out but for a number of years the grower must determine for himself the varieties which seem to readily adapt themselves and produce the finest and greatest quantity of nuts on his soils.

Pecans can be grown in every county in Alabama and it is hoped that this Bulletin will create more interest in this profitable industry. Plant pecan trees either for their shade or their profits. The best nut for every county has been found and every farmer should try out new varieties and keep records of them, then in a few years we can safely say which is the best nut for each particular county.

Co-operative work along these lines is strongly urged and specimens of nuts with the form filled in under Appendix and their names should be sent into the State Horticulturist at Auburn, Ala., for recording.

APPENDIX

GENERAL FORM FOR PECAN RECORDS.

All persons owning budded or grafted trees or exceptionally fine seedling trees should keep records of them in the following way. This outline was prepared by the Secretary of the National Nut Growers' Association and where possible this blank should be properly filled in, torn out and mailed to the State Horticulturist at Auburn, Alabama, as these records will be invaluable to the State at large.

GENERAL.

1. Name of variety.
2. Place of observation.
3. Origin and parentage of tree.
4. Date of Planting.
5. General character of growth.
6. Height.
7. Circumference, 3 feet from the ground.
8. Form of top-upright, spreading or dropping.

LEAF.

1. Date of first appearance.
2. Date of full leaf.
3. Date of first falling of leaf.
4. Date of tree bare.

FLOWER.

1. Date of appearance of first male flowers.
2. Date of full blooming of male flowers.
3. Date of disappearance of male blossom.
4. Date of formation of first nuts.

1. Date of first mature nuts.
2. Date of average ripening of crop.
3. Date of last ripening.
4. Date of gathering crop.
5. Yield.

INSECT INJURIES.

1. What insects affect the limbs, trunks, leaves?
2. What is the extent and character of the damage?
3. What fungus diseases affect the tree?
4. What is the character and extent of the damage?

CLIMATIC CONDITIONS.

1. Frosts—date of occurrence at or after blooming.
2. Frosts—date of occurrence before ripening of fruit.
3. Rainfall, by months.
4. Temperature, maximum and minimum, each month. This can be supplied from nearest Weather Bureau station.

SOIL AND DRAINAGE.

1. Character of surface soil.
2. Character of the subsoil.
3. Lay of the land, flat, sloping or hilly.
4. Exposure.

5. Proximity to streams or ponds.
6. Depth to ground water, as indicated by average water of near by wells.

OTHER CHARACTERISTICS.

1. Date after permanent planting that tree bore first nuts.
2. Is the tree a regular or irregular bearer?
3. Is the tree solitary? If not, how near to other trees?
4. Does the nut part easily from the husk?
5. Fertilizers—kind, amount, when applied?