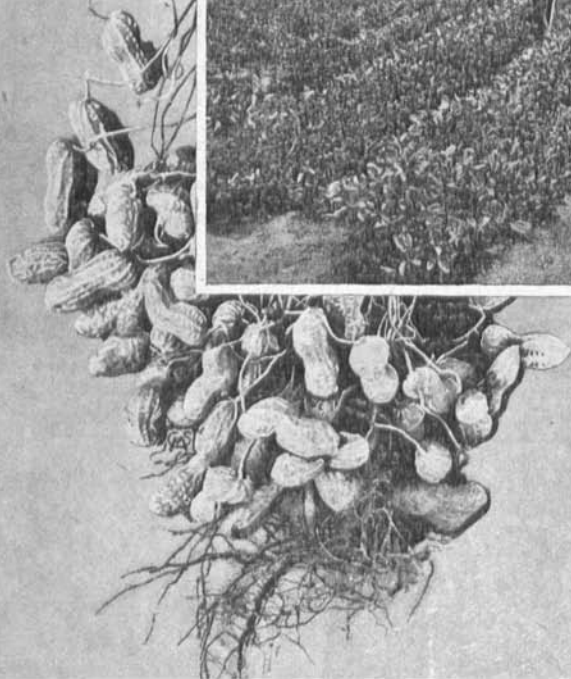


Farmers' Bulletin-1127  
United States Department of Agriculture

# PEANUT GROWING FOR PROFIT



**P**EANUTS have become one of the best money crops for use in rotation with cotton and other farm crops in the fight against the boll weevil. Until recently peanuts were grown in the greater part of the Gulf coast region primarily for stock feeding, but now they are of commercial importance in no less than 12 Southern States.

Good seed, proper preparation of the soil, frequent cultivation of the crop, proper harvesting and curing, and grading the product according to standard grades are the main essentials to the realization of a profit from peanuts. Most failures have been due to the neglect of one or more of the above essentials. Many losses have resulted from the practice of windrowing the peanut vines for curing instead of stacking them around small poles.

Peanuts are in increasing demand for oil manufacture and for making many other peanut products. It is always safe for the Southern farmer to grow peanuts, as every part of the crop can be used to advantage for feeding on the farm in case the market does not justify their sale. A closer working relation between growers and dealers is desirable, and the establishment of standard grades will do much toward stabilizing the industry.

Contribution from the Bureau of Plant Industry

WM. A. TAYLOR, Chief

Washington, D. C.

July, 1920

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# PEANUT GROWING FOR PROFIT.

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## CONDITIONS NECESSARY FOR PEANUT GROWING.

**P**EANUTS are at present an important money crop in no less than 12 of the Southern States, especially in those regions infested by the cotton boll weevil. The peanut is a native of the Tropics and was introduced into the United States during the earlier days of colonization but did not become of commercial importance until about 1870. From that time until 1897 its importance as a farm crop was relatively small, but the production and uses of peanuts have increased enormously during the past 20 years. In 1918 the peanut crop of the United States was approximately 53,000,000 bushels, valued at about \$100,000,000.

The peanut is a pea rather than a nut and belongs to the same group of plants as do beans and common garden peas, differing only in that it possesses the character of blooming above ground and maturing its fruit, or pod, beneath the surface of the soil. The small yellow flowers are borne at the joints where the leaves are attached to the stems, and as soon as pollination takes place the flower fades and the "peg," as it is commonly called, elongates and goes into the soil, where the pod develops. Hence, it is essential that the crop be grown on soil where a loose surface can be maintained.

Peanuts will adapt themselves to a wider range of climate if soil conditions are favorable than almost any other southern crop. The climatic requirements of the peanut are a season of 100 to 140

days without frost, moderate rainfall during the growing period, an abundance of sunshine, and a relatively high temperature. Best results are secured under conditions where the normal annual rainfall is from 42 to 54 inches. Peanuts are frequently grown under irrigation. However, fair yields have been made without irrigation where the annual rainfall is less than 19 inches. On the other hand, good crops have been produced on low bottom lands with 54 to 60 inches of rainfall.

Light sandy loam soil is best adapted to the production of peanuts for the market. Poorly drained or sour soils are not generally desirable. For hog feeding or as forage the crop may be grown on almost any type of soil except the "black-waxy" and extremely heavy clays.

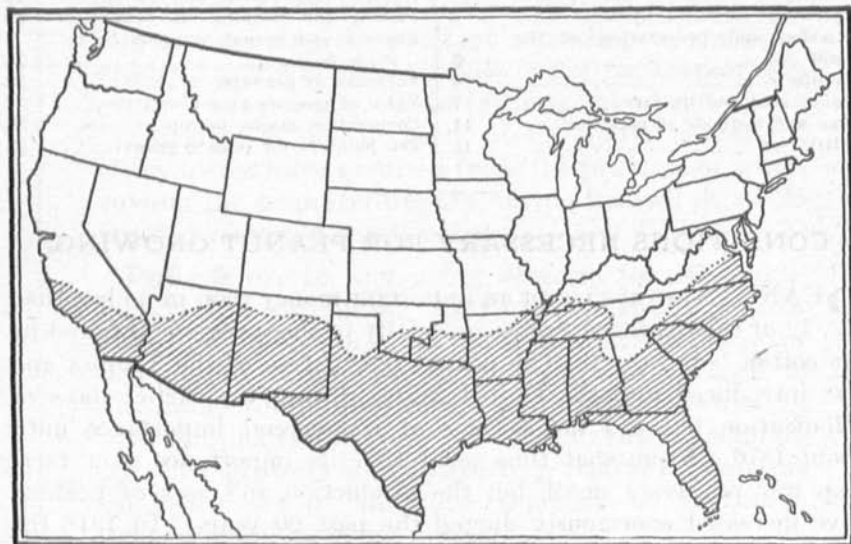


FIG. 1.—Outline map of the United States, suggesting the possible area adapted to the production of peanuts.

Sandy loam soils that will produce good crops of beans and potatoes are considered suitable for growing peanuts.

The territory indicated on the dark portion of the map shown in figure 1 is, for the most part, adapted to the production of peanuts. Outside of this area their cultivation is more or less uncertain, although in a few localities they may be grown successfully for stock feeding. The soil and climatic conditions of southeastern Virginia and northeastern North Carolina seem to be especially adapted to the growing of the Virginia Bunch and Virginia Runner varieties, which constitute the bulk of the large-podded, or "Jumbo," peanuts appearing on our markets. Throughout the Gulf coast region, Oklahoma, and Arkansas the Spanish variety has proved most satisfactory.

**SELECTION AND PREPARATION OF THE SOIL.**

In selecting land for peanuts, two things must be considered: (1) The character and adaptability of the land and (2) the character of the crops planted or the rotation practiced during previous years. The peanut crop is subject to injury from crab-grass and other weeds; therefore, it should follow some crop that has been kept clean. Cowpeas, velvet beans, sweet potatoes, and Irish potatoes are good preparatory crops. Winter oats also are frequently followed by a late-planted crop of peanuts. Cornstalks or cotton stalks interfere greatly with the cultivation and harvesting and should be either removed or plowed under to a depth of at least 8 or 9 inches.

Peanuts should not be planted on the same land oftener than once in three or four years. The rotation should include at least two soil-building crops, one of which is a winter cover crop. Cowpeas, velvet beans, or soy beans, planted either alone or with corn, are good soil builders. Winter cover crops include bur clover, crimson clover, giant red clover, alfalfa, vetch, rye, barley, purple-top turnips, and English cowhorn turnips.

In a rotation experiment being conducted at the Virginia Truck Experiment Station, near Norfolk, the crop rotation consists of corn with crimson clover as a winter cover crop during the first year, early Irish potatoes followed by cowpeas the second year, and Spanish peanuts the third year, followed by rye as a winter cover crop. Alongside of the three plats handled in rotation is a similar plat on which peanuts are grown continuously. This experiment has extended over a period of 10 years, and for the past 3 years the rotation plats have yielded approximately three times the quantity of peanuts produced on the continuous plat.

Plowing should be done at least six weeks before planting time. If considerable rough material is to be turned under, fall or winter plowing should be practiced except on soils that wash badly. Buckshot or other heavy soils on which peanuts are grown for stock feeding are benefited if turned up to the action of frost during the winter months.

Thorough preparation of the land before planting is essential. The Virginia peanut grower, although his land is naturally mellow, plows every inch of space, then harrows and drags it at least three times or until the soil is in the best possible condition. The subsequent cost of cultivation is thereby greatly reduced. The land should be plowed broadcast, preferably with a 2-horse turning plow, rather than "bedded," as is often done for cotton or corn. With good seed and thorough preparation of the soil the Virginia farmer secures a good stand, without which a profitable crop can not be made.

## FERTILIZERS.

## USE OF STABLE MANURE.

Stable manure should be applied to a crop grown in rotation with peanuts rather than to the peanut crop. Well-rotted manure, if thoroughly mixed with the soil, may be applied in small quantities at the time the land is being fitted. Fresh manure, however, should not be used at planting time, as it has the tendency to produce a large percentage of poorly filled pods or "pops."

## APPLICATION OF COMMERCIAL FERTILIZERS.

Commercial fertilizers, having an analysis of 8 per cent phosphoric acid, 2 per cent nitrogen, and 2 or 3 per cent potash, such as are ordinarily used for corn and cotton, may be profitably applied at the rate of 300 to 500 pounds to the acre. An application of a mixture consisting of 200 pounds of 16 per cent acid phosphate and 100 pounds of cottonseed meal per acre is frequently made. Where sweet potatoes, Irish potatoes, or any heavily fertilized crop has been grown the previous year, an application of 200 pounds of commercial fertilizer of the above formula to the acre will usually be sufficient. The use of commercial fertilizers is not so important where soil-building crops are grown in the rotation.

Commercial fertilizers are usually applied just before planting the peanuts. However, if applied three or four days in advance they will become better mixed with the soil. Roots of the peanut do not spread far from the row, and the best results may be secured by sowing the fertilizer directly in the row, using a 1-horse fertilizer distributor. One or two shovels fitted to the back of the distributor will aid greatly in mixing the fertilizer with the soil.

## IMPORTANCE OF LIME.

The Virginia peanut grower considers the use of lime essential in order to insure the proper development of the pods. Not all soils require the addition of lime, but wherever doubt exists, an application of 400 to 800 pounds to the acre should be made. As a general rule, the silt loams of the river valleys and delta regions contain plenty of lime. This is also true of many of the sandy loam soils on which peanuts are grown. Experimental data obtained at the department substation at Florence, S. C., indicate that no benefit is to be derived from the use of lime in growing peanuts on the soil of that region. It should be borne in mind that the lime requirements of adjoining farms may differ and that the only way to determine the matter is by applying lime to a portion of the crop and observing results.

Lime should not be applied at the same time as commercial fertilizer but either a week or 10 days in advance or later as a dressing alongside the rows of peanuts. Lime should not be plowed under but sown broadcast after plowing and harrowed into the surface. In Virginia where marl beds abound, 10 to 15 1-horse cartloads per acre are sometimes scattered upon the land during the winter months as a substitute for lime.

#### WOOD ASHES.

Hardwood ashes are a desirable fertilizer for peanuts, as they contain both potash and lime. Unleached wood ashes, particularly those from hickory, oak, and similar hardwoods, may be applied broadcast at the rate of 800 to 1,200 pounds to the acre. Ashes produced from the burning of pine and other soft woods and hardwood ashes that have been exposed to the weather are of little value as a fertilizer.

#### THE PEANUT AS A NITROGEN GATHERER.

Peanuts as ordinarily handled do not improve the soil, despite the fact that they have the power of collecting the free nitrogen of the atmosphere and storing it in nodules upon their roots (fig. 2). If, in harvesting, the greater part of the roots can be cut off and left in the ground, the drain on soil fertility is reduced to a minimum. The fact remains that, because of the system of harvesting followed, peanuts do not have the same effect in improving the soil as do the clovers, cowpeas, velvet beans, soy beans, and alfalfa, the root systems of which are not removed from the ground.

#### PEANUT SEED AND ITS CARE.

##### PRODUCTION AND SELECTION OF SEED.

High-grade seed is just as important with the peanut as with corn, wheat, or any other farm crop. Poor seed peanuts have been responsible for most of the failures to secure a good stand. In almost every community at least one and often several growers have a particularly good strain of seed peanuts. If such seed can not be obtained locally, arrangements should be made, preferably through the county agent or by an organized group of farmers, to secure, well in advance of planting time, an adequate supply of high-grade seed from some outside source.

The corn and wheat crops of the country have been increased many millions of bushels through seed improvement, and the same opportunity exists with peanuts. The proper method of producing seed is to grow a special seed patch, the seed for which has been selected from vigorous, high-producing plants the previous year. If this

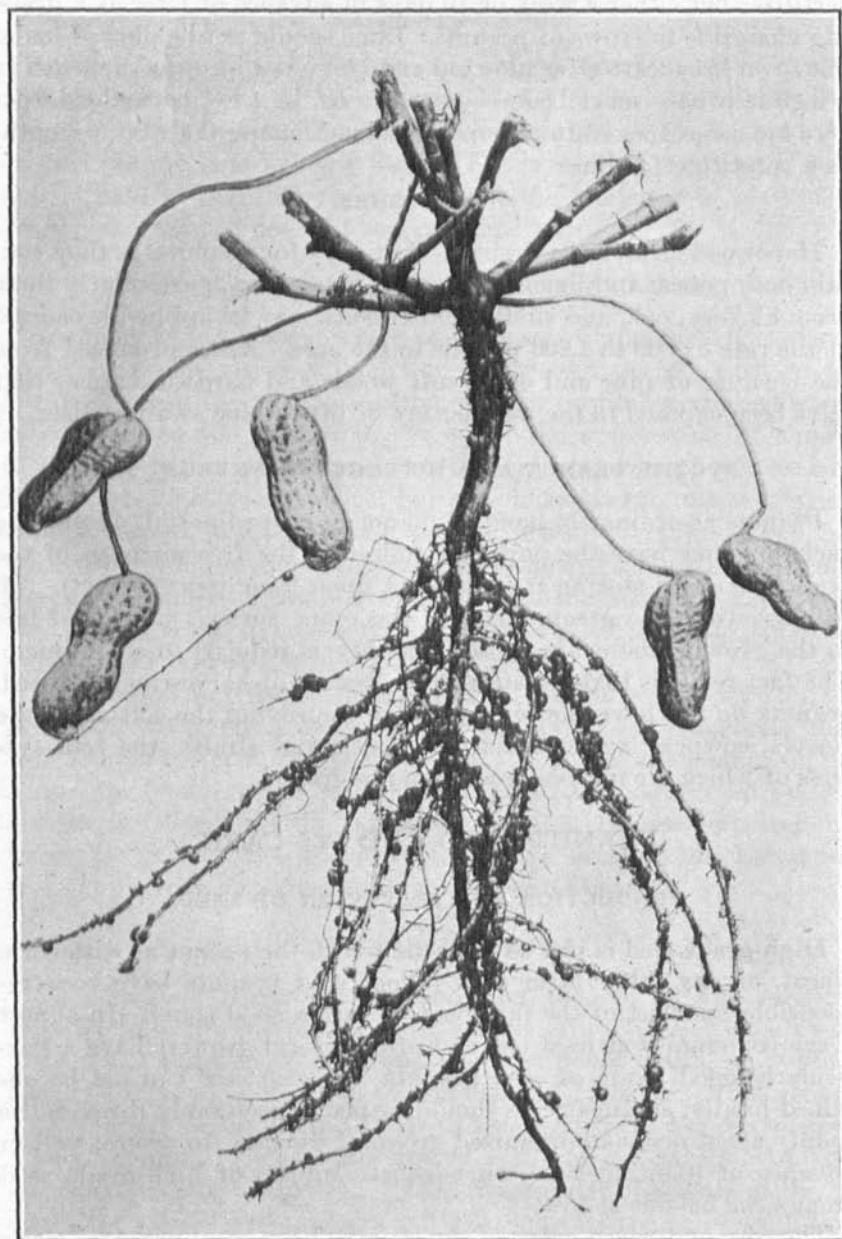


FIG. 2.—Roots of a peanut plant, showing nodules formed by the bacteria which collect nitrogen.



plan is not followed, a section of the field where the crop is especially good should be set aside and saved separately for seed.

Peanuts intended for seed, after becoming fully mature, should be dug carefully during bright weather, and placed in small stacks around poles, as described under "Stacking." After a curing period of at least eight weeks, the seed peanuts should be picked from the vines and stored in bags in a dry building. Preferably they should be hung from the joists or rafters by wires, so that rats or mice can not destroy them. Where not more than 20 bushels of seed are required, the picking should be done by hand; but when a large amount is needed a peanut picker that will not break the pods may be employed.

#### PREPARATION OF SEED FOR PLANTING.

During the winter, when there is spare time, the seed peanuts should be taken down and carefully cleaned by hand and any remaining trash removed. If a large quantity is to be cleaned, the peanuts may be again run through the picking machine, if available, under heavy fan blast, to take out all light or inferior pods as well as any remaining stems or particles of trash. This can best be handled on a community basis in charge of a central leader. It is also important that the greater part of the small stems or tails that attached the pods to the vines be removed. (Fig. 3.) After cleaning, the peanuts should again be bagged and hung up until needed for planting. A rat-proof seed room constructed of closely woven galvanized wire is desirable where large quantities of seed are to be stored.

Any breakage or injury to the thin red covering of the seed will affect germination. Seed of the large-podded varieties is practically all shelled by hand within two weeks of planting time. Varieties of the Spanish type are more difficult to shell by hand, and where large quantities of seed are required small hand shellers, carefully operated, may be used without serious injury. Breaking the pods in two serves the same purpose as shelling. A large percentage of the Spanish peanut seed is first soaked in the shell for 12 to 24 hours in cold water; then drained and spread on sheets for 1 or 2 hours or until dry enough to handle. Planting is done either by hand or with a peanut planter adapted to handling seed in the shell. Shelled seed should not under any circumstances be soaked before planting, as the swelling of the seed bursts the red covering and injures germination.

In sections where salamanders, moles, and other rodents destroy the peanut seed after planting, it should be spread upon the floor or on a wagon sheet, sprinkled with a solution containing equal parts of pine tar and kerosene, and stirred to distribute the mixture uni-

formly.\* The entire surface of the pods need not be coated, only a small amount being necessary to repel the rodents. The application

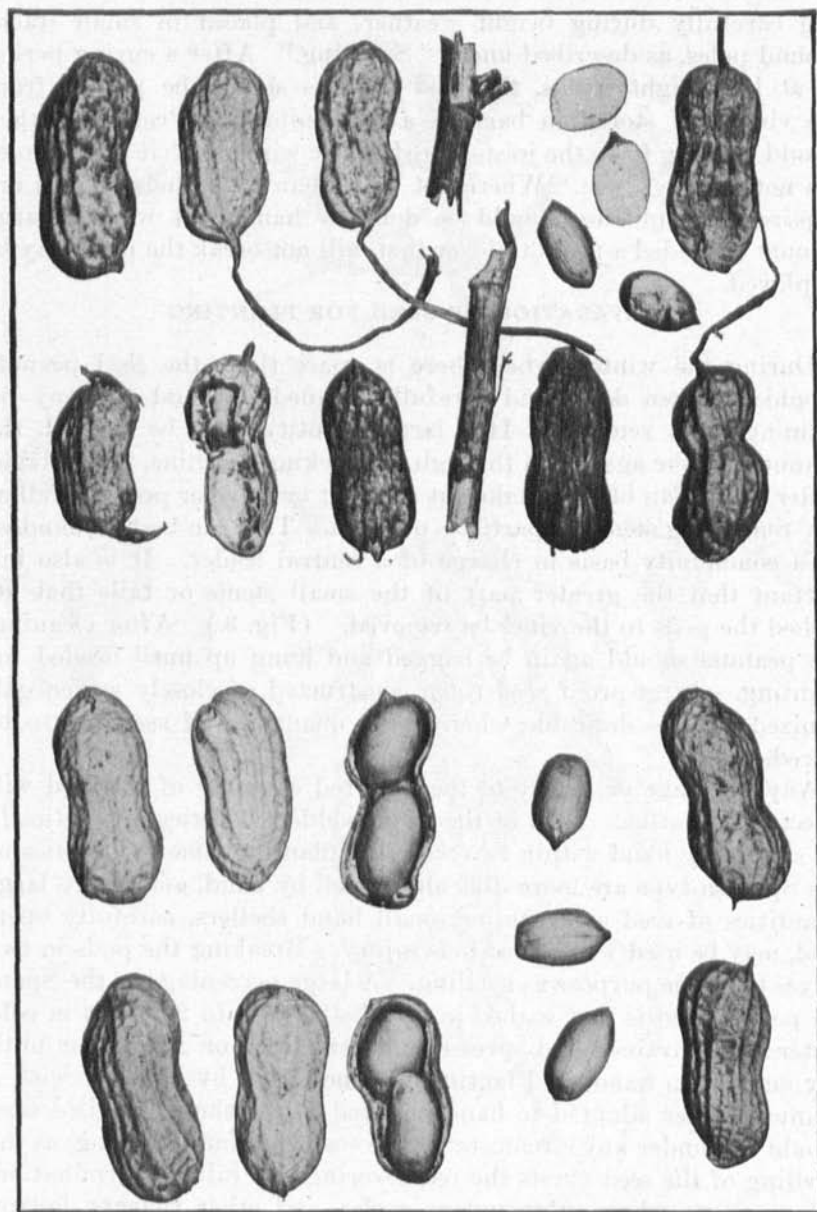


FIG. 3.—Seed peanuts. Top, including inferior nuts and trash as delivered by the picker. Bottom, re-cleaned and hand-selected peanuts.

of the tar solution in moderate quantities to shelled seed will not injure its germinating qualities if the work is done carefully.

**SEED REQUIRED TO PLANT AN ACRE.**

From 32 to 48 pounds of Spanish peanuts in the shell will plant an acre, the amount depending upon planting distances. To plant the same area with shelled seed will require from 23 to 34 pounds. With the large varieties, 24 to 30 pounds of shelled seed are required to plant an acre.

**TIME AND METHODS OF PLANTING.****TIME OF PLANTING.**

Throughout the greater part of the commercial peanut area, the planting of the main crop is done between April 10 and May 10, but in no case should the seed be planted until the soil is reasonably warm. The large varieties require a longer period for their development than do those of the Spanish type. Best results are secured from early planting, but in the Gulf coast region Spanish peanuts may be planted as late as July 1 and a fairly good yield secured. When large acreages are grown, plantings should extend over a period of at least three or four weeks, so that the entire crop will not be ready for harvesting at one time.

**PREPARATION OF LAND FOR PLANTING.**

If the land has been well fitted and leveled, the rows at planting time may be laid off with a 1-horse marker. The fertilizer is then distributed, as described under "Application of commercial fertilizers," and the peanut planter run along the same marks. A planting gang, consisting of a team attached to the harrow, a 1-horse marker, two fertilizer drills, and two peanut planters, will plant 10 or 12 acres a day. On a small scale two men with a double team can work to advantage. First, a section of the field is dragged or harrowed; the team is then split, one horse being used to mark the rows and sow the fertilizer, while the other is employed to draw the peanut planter. From 4 to 5 acres a day may be planted in this manner.

**DISTANCES TO PLANT.**

Planting distances depend upon the type of tools used in cultivation, the character of the soil, and the variety of peanuts grown. The usual distance between rows is 36 inches, but varies from 32 to 42 inches, according to localities and conditions. The distance at which the seed is spaced in the row also varies according to variety and local conditions.

Experiments conducted recently by the Department of Agriculture at its substation at Florence, S. C., show conclusively that on the light sandy loam soils of that region the highest yields are

secured where the seeds of the Spanish and Virginia Bunch varieties are dropped very closely in the row, the best yield being obtained at a distance of 3 inches, with the rows 30 inches apart. Whether this would hold good on the rich river-bottom lands in certain parts of the South is a question, but there can be no doubt that a better stand and a higher yield will under most conditions be secured by

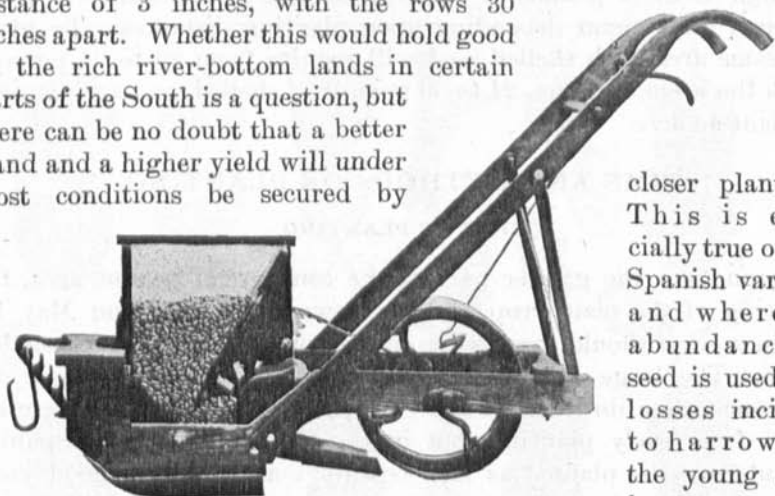


FIG. 4.—A 1-horse peanut planter.

closer planting. This is especially true of the Spanish variety, and where an abundance of seed is used the losses incident to harrowing the young crop become a negligible factor.

A table of planting distances for the various varieties of peanuts follows:

*Table of planting distances for peanuts.*

Variety.	Distance (inches).		Variety.	Distance (inches).	
	Between rows.	In rows.		Between rows.	In rows.
Spanish.....	32 to 38	7 to 10	Virginia Bunch.....	32 to 38	8 to 12
Valencia.....	32 to 42	8 to 12	Virginia Runner.....	36 to 42	12 to 18
Tennessee Red.....			North Carolina.....	34 to 38	12 to 15
Georgia Red.....			African.....	36 to 42	12 to 18

#### DEPTH TO COVER THE SEED.

Peanut seed should be covered to a depth of  $1\frac{1}{2}$  to 2 inches on light sandy soils and 1 to  $1\frac{1}{2}$  inches on the heavier soils. If the soil contains plenty of moisture the depth should be less than if moderately dry. Slight firming of the soil over the seed is desirable, and the modern planting machines are fitted with a concave wheel that follows the covering blades and slightly rolls or firms the soil. Much depends upon the care taken by the operator of the planting machine, to see that it is dropping and covering properly. Some of the machines now on the market are fitted with agitators, which keep the peanuts from packing together in the hopper. Plenty of seed should be kept in the machine, and any remaining stems or trash removed frequently in order to prevent clogging. A peanut planter is shown in figure 4.

## PLANTING BY HAND.

When planting seed by hand, a small furrow is opened with a single-shovel plow, the seed dropped, and covered with a 1-horse cultivator or with a hand hoe. A notched board attached to the back of the cultivator will form a slight ridge of soil directly over the row.

## CULTIVATION.

Cultivation of the peanut crop should begin as soon as the rows can be followed, and continue until the vines occupy the greater portion of the ground. Frequent shallow cultivation, similar to that given beans and peas, is the keynote of success in the production of a peanut crop. As soon as the soil is reasonably dry after heavy rains the surface should be stirred, and during dry weather a soil or dust mulch will help to conserve moisture. In some sections of Virginia and North Carolina, on the sandy loam soils that are free from trash, the peanuts are harrowed carefully about a week after they are up, using a light spike-tooth harrow with the teeth set sloping back. At least one hand hoeing will be necessary, and the best time to do it is usually about the time the plants begin to spread, or following the third cultivation. About five cultivations are required; however, their number will depend entirely upon weather conditions.



FIG. 5.—A 1-horse cultivator.

## IMPLEMENTS FOR CULTIVATION.

In most sections of the South sweeps and 5-tooth cultivators are already on the farms. Of the two the 5-tooth cultivator is preferable, especially if provided with two or three sizes of shovels. The first one or two cultivations should be with the  $1\frac{1}{4}$  inch or narrow shovels, and subsequent workings with the  $2\frac{1}{2}$  or 3 inch shovels or points. (Fig. 5.) By working the soil toward the rows during cultivation a broad, flat bed of earth will be formed, leaving a water furrow between the rows.

On light sandy soils, such as are found in many sections of the peanut territory, the greater part of the work of cultivation can be done by means of a 1-horse weeder of the special type shown in figure 6. This tool is light, and can be dragged diagonally across the

rows, first in one direction and then in the other, without serious injury to the plants. At the substation at Florence, S. C., it has been found that practically no hand hoeing is necessary where the crop is worked about twice a week with this type of tool until the "pegs" begin to form. After the pegs begin to take hold of the soil a riding cultivator may be used between the rows. A small tooth should be placed next the row, and so adjusted that it will not go more than 2 inches into the soil. Next to this there should be a large tooth, and a sweep in the center of the row. The vines must not under any circumstances be disturbed after they begin to "peg down," and only the middles should be cultivated after the pods begin to form. (Fig. 7.)

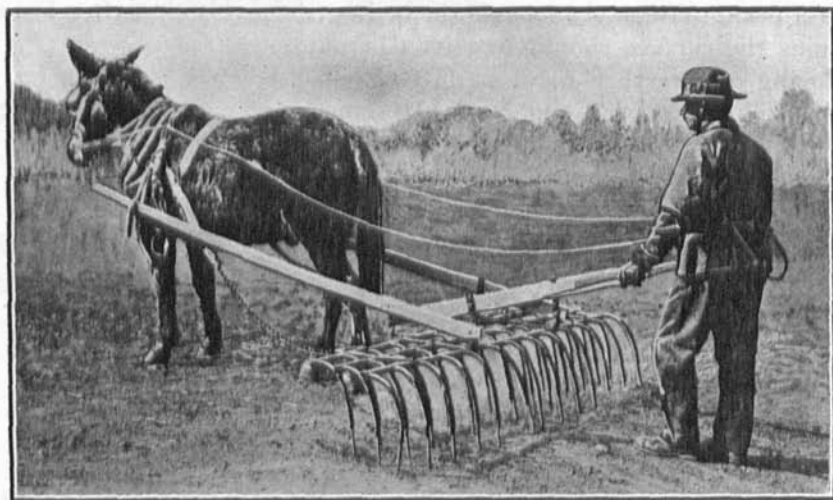


FIG. 6.—Type of weeder often used for the first cultivation of peanuts.

After the "pegs" or pods begin to form they should not be disturbed, but a narrow cultivator or sweep should be used to keep the middles clean and work a little loose soil under the sides of the plants, thus providing a bed of fine earth in which later pods may form.

#### SPECIAL CULTURAL PRACTICES.

Shoveling dirt upon the center of the peanut plants injures the quality of the hay, and it is doubtful whether a greater number of pods is formed. Running a light roller over the plants after the final cultivation to flatten the stems upon the ground and enable the little "pegs" to reach the soil may be desirable in the case of the spreading varieties, but is a questionable practice with the Spanish or any of the erect-growing types.

The primary object should be to so cultivate the crop that the largest possible number of perfect pods will set and mature at the same time, yielding a uniform product.

## HARVESTING, STACKING, AND CURING.

### TIME OF HARVESTING.

Peanuts should be harvested before the vines are killed by frost. When to harvest the crop may be determined in two ways: (1) By a slight yellowing of the foliage, and (2) by an examination of the pods. If the peas are full grown and the inside of the shells has begun to color and show darkened veins it can be assured that they are ready for harvesting. The tendency of many farmers has been to dig too early and before most of the peanuts have fully developed. On the other hand, if harvesting is deferred too long the peanuts shed their leaves, and in the case of the Spanish variety many kernels will be lost by sprouting, especially if a rainy season should occur.

### METHODS OF DIGGING.

Peanuts should be loosened from the soil by means of a sharp implement that will cut off the greater portion of the root system on which the nitrogen nodules are borne. A number of diggers of the plow type that do this in a fair manner are on the market; there are also special peanut points to be attached to an ordinary turning plow. (Fig. 8.) A very simple and effective type of peanut digger consists of a sharpened, curved steel bar, which is attached to a Georgia plowstock, as shown in figure 9.

The practice of digging peanuts with the ordinary 1-horse plow or a Georgia stock with a sweep attached has been to some extent



FIG. 7.—Peanut flower and the pegs that form pods.

responsible for the depletion of soil fertility in the peanut fields of Virginia and North Carolina.

Regular machine potato diggers with elevators (fig. 10) have been found very satisfactory where the soil is reasonably dry and the crop is free from grass. These machines not only lift the peanut from the ground, but also shake off the soil, as shown in figure 11. By regulating the depth of the point,

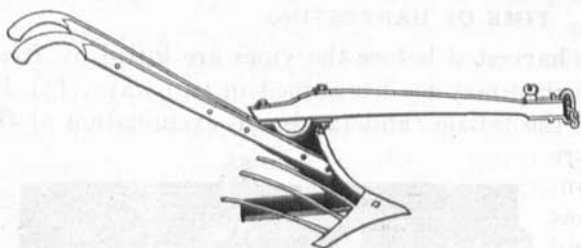


FIG. 8.—Plow type of peanut digger.

off just deep enough to avoid loss of the pods, leaving most of the nitrogen-bearing nodules in the soil.

Digging should not begin in the morning until the vines are dry, and no more should be dug than can be placed in stacks during the day.

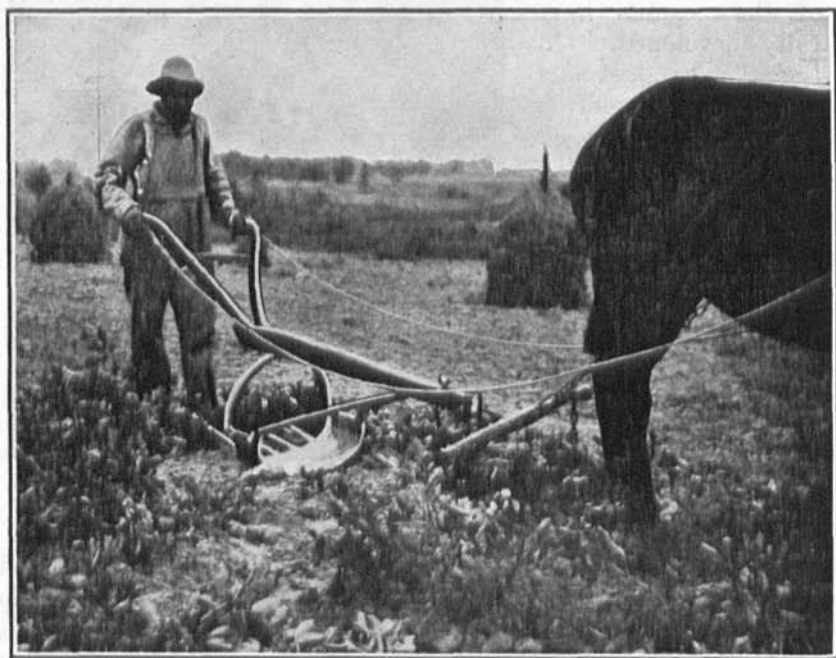


FIG. 9.—A simple and effective peanut digger made by a local blacksmith.

#### CURING THE VINES AFTER DIGGING.

After the peanut vines are loosened and the soil shaken from them they are allowed to lie either spread upon the ground or in small



bunches until the leaves are slightly wilted, but not until they become curled or brittle. If the weather is suitable for curing the crop, stacking may begin within an hour or two after digging.

#### STACKING.

There is but one right way of curing peanuts and that is by putting them in small stacks around poles, to which two crosspieces have been nailed a few inches above the ground. Curing in windrows may succeed about one year out of five in sections having little rainfall at harvesting time, but the farmer who uses this method is always taking a great risk of losing his crop.

Small poles or split stakes 3 to 4 inches in diameter at the base, cut 7 feet in length and sharpened at both ends, are the best type of

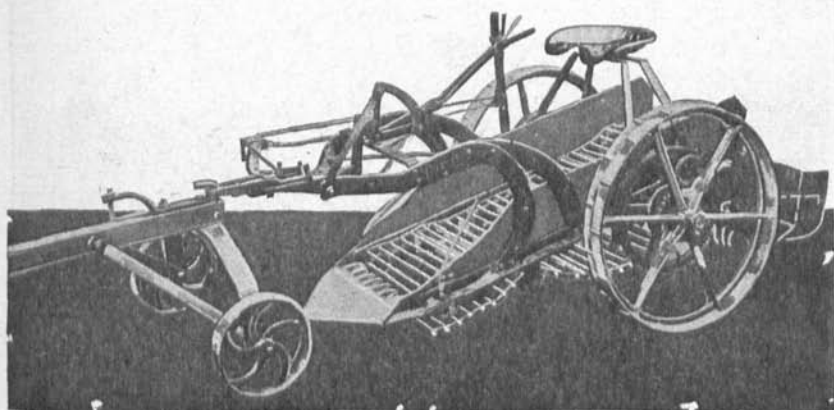


FIG. 10.—Potato digger used for harvesting peanuts.

stake around which to stack peanuts. The crosspieces should be 14 to 18 inches long and may consist of edging strips from the saw-mill or short pieces of split timber similar to stove wood. From 15 to 30 stacking poles will be required for an acre, and both poles and crosspieces should be ready for use well in advance of harvesting time. Two crosspieces only are required for each pole, and these are nailed at right angles one directly above the other, as shown in figure 12.

Then 12 to 14 rows of peanuts are placed in a stack row. After a sufficient number of rows are dug the stakes are distributed and set by making holes with a post-hole digger, crowbar, or an old wagon axle, inserting the stake, and tamping the soil firmly around them so that they will not blow over with the weight of the stack upon them. The crosspieces are then nailed on at right angles to each other 8 to 12 inches from the ground.

For assembling the peanut vines around the stacking poles a fork having six or eight tines is the best implement. As the vines are brought together they are laid in a circle on the ground, with the roots toward the pole at a convenient distance from the pole, so that the person doing the stacking can work comfortably. In starting to build the stack a few vines are hung over each of the crosspieces, thus forming a foundation. The stack is built by piling the vines around the pole by hand, pressing them down, and keeping all the peanuts on the inside next to the pole. (Fig. 13.) Occasionally a bunch should be divided and hung around the pole in order to bind the stack together and to keep the center about 1 foot higher than the outside, that the stack may shed water. Where the vines are ex-



FIG. 11.—Potato digger used for digging peanuts.

tremely long the center of the stack should be kept high from the start. In order to provide free circulation of air and prevent the possibility of the nuts heating and souring in the stacks, under no circumstances should the stacks be more than 36 to 42 inches in diameter.

As the stack nears completion it should be gradually drawn to a point and a few vines crowded down over the sharpened top of the stake to complete the stack. A little dry grass or weeds may be placed on top of the stack, but too much will have a tendency to prevent circulation of the air through the stack and interfere with the proper curing of the peanuts. A typical completed stack is shown in figure 14.

Peanuts are, as a rule, stacked in the field where the crop is grown, but sometimes the vines are hauled to a central point where the

stacks are built close together and inclosed with a fence in order that the hogs may be turned into the field to gather the nuts detached in harvesting.

#### LENGTH OF CURING PERIOD.

Peanuts intended for the market should remain in the curing stacks at least six weeks before being picked from the vines. Peanuts cure rather slowly in the stacks, and if picked from the vines too soon the peas have a tendency to shrivel and there is more or less danger of molding or fermenting after picking. Where the peanuts, vines and all, are to be used for stock feed, they should be cured in stacks for at least two to four weeks before being stored in barns.



FIG. 12.—Poles around which stacks of peanuts are to be built.

#### PICKING AND CLEANING.

Picking the commercial peanut crop of the United States is done mainly during the months of October, November, and December. Peanuts can be picked satisfactorily only when the vines are dry and brittle, as damp weather causes them to be tough and the pods difficult to detach. If for any reason it is necessary to pick the peanuts when they are damp or before they are fully cured, they should not be stored in large quantities but spread thinly on a floor and stirred from time to time until dry. If bagged or stored in bulk before they are fully dry, they will go through a sweating or souring process that renders them unfit for the market or for seed.

## METHODS OF PICKING.

Hand picking, as practiced in Virginia and North Carolina in the early days of the peanut industry (fig. 15), is no longer practicable with the commercial crop. A satisfactory peanut-picking machine must remove all of the marketable nuts from the vines with a minimum amount of breakage of the pods. Two types of picking machine are now on the market: One, working on the principle of a cylinder grain thrasher, and the other being provided with a wire mesh over which the peanuts are drawn in such a manner that they fall through and are pulled from the vines. The capacity of peanut-



FIG. 13.—Partly completed stack of peanuts, showing the method of placing the vines in stacking. Completed stacks are shown in the background.

picking machines depends upon the make of machine and the condition of the peanuts, about 250 bushels per day being an average. In addition to removing the pods from the vines, the machines have special facilities for cleaning them and taking off the small stems. (Fig. 16.)

In order that no time be lost by hauling the stacks long distances, the picker is set at a convenient point near the center of the field and in large fields may be moved two or three times to shorten the haul. The entire stack, pole and all, should be brought to the picker, none of the peanuts being wasted by this method, as would be the case if the vines were removed from the poles in the field. The poles can be loosened from the ground by means of a handspike thrust

underneath the crosspieces. Two men can then easily load the stacks upon low-wheeled wagons, and during the unloading the poles are drawn out and thrown to one side.

In sections where peanuts are extensively grown, a special 2-wheeled cart, as shown in figure 17, is frequently employed for hauling the stacks to the picker. The cart is backed against a peanut stack, the short chain, attached to the end of the lever, hooked around the top of the stacking pole, and the stack raised free from the ground by drawing down the long end of lever and securing it under a hook attached to the shaft. The outfit is then driven to the

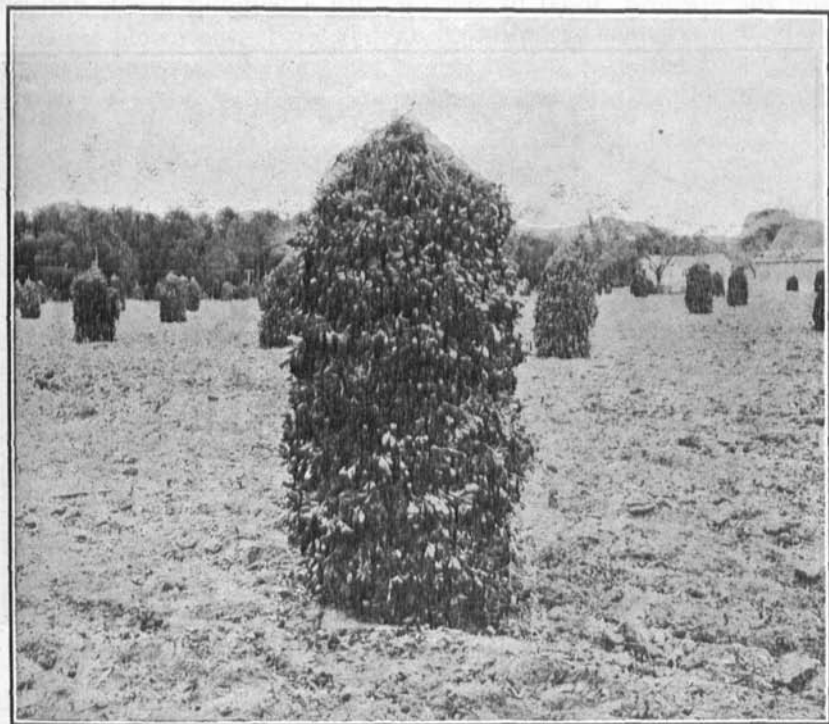


FIG. 14.—Typical stack of peanuts at the time of completion and before it has settled.

picker, the lever released, and the chain unhooked from the stacking pole. By driving the horse in a trot, an outfit of this kind will move almost as many stacks to the picker as a 2-horse team attached to a wagon with two men to load and unload it. The cart, however, gives best results where the haul is short.

Slow, uniform operation of the picking machine will secure best results both as to quality and quantity of peanuts, and if the vines are either damp or extremely dry the machine will need to be adjusted to suit their condition. Four or five men are required to operate the machine; one to place the peanut vines in small forkfuls

upon the feeding table, one to feed them uniformly through the machine by hand, one to handle the peanuts as they are delivered from the machine, one to throw back the hay, and one to attend to the oiling and care of the machine.

#### BAGGING.

Most of the peanut-picking machines have a bagging attachment, and the peanuts go directly into standard peanut bags. These are 32 by 36 inches in size and hold approximately 120 pounds of Spanish peanuts. As the bags are filled, they are taken from the machine and the opening closed by sewing with a bagging needle and soft



FIG. 15.—Old-fashioned method of picking peanuts from the vines by hand.

twine. The bags are then hauled direct to a barn or storage shed. If on account of shortage of teams the peanuts can not be hauled to the storage place the same day they are picked, the bags should be piled on a foundation of poles and securely covered with canvas or peanut vines, to protect them, for a day or two, until they can be hauled.

Peanuts as they come from the picker frequently contain more or less moisture and should be stored so as to permit a free circulation of air. The building in which peanuts are stored should have a good roof and the bags should be fully protected from rain. The bags should not be piled directly upon the ground or on a tight floor, but poles or 2 by 4 scantling should be placed under them to provide ventilation. Great losses occur in the farm storage of peanuts from

the ravages of rats and mice, which not only destroy the nuts but by cutting holes in the bags cause serious losses during subsequent handling. Any storage can be made rat and mouse proof by lining it with woven wire the meshes of which are less than one-half inch.

#### CLEANING AND GRADING PEANUTS FOR THE MARKET.

Sometimes the peanuts are ready to market as they come from the picker; but more often there is more or less rubbish, including broken stems, light pods, roots, sand, and small stones, which must be removed before the peanuts are in condition to market. The grading is accomplished by recleaning, during which the trash and light pods are blown out. Special fanning mills are sometimes employed for this purpose, or the peanuts may be again passed through the picking machine, utilizing the cleaning device. In recleaning, the



FIG. 16.—Peanut picker and crew.

peanuts may be fed through the picker in a steady stream as fast as they can be handled by the cleaning attachment, a heavy air blast being maintained. After being recleaned, they are resacked in new sacks. Each sack is weighed, and the weight and grade marked upon it. The peanuts are then ready for marketing.

#### GRADES OF PEANUTS.

Standard grades of peanuts have been adopted in several of the Southern States, based upon the quantity or percentage of first-class kernels that may be shelled from a given sample. In June, 1919, the Southern Peanut Crushers' Association adopted the following rules for the grading of peanuts:

SECTION 1.—There shall be four general classes known as "White Spanish," "Bunch," "Runners," and "Mixed." There shall be three grades of each class, known as No. 1, No. 2, and No. 3.

SEC. 2. These grades shall be based upon the percentage of total sound and matured kernels as follows:

- No. 1. Not less than 70 per cent sound and mature kernels and not more than 3 per cent damaged.
- No. 2. Between 65 and 70 per cent sound and mature kernels and not more than 3 per cent damaged.
- No. 3. Between 60 and 65 per cent total sound and mature kernels and not more than 3 per cent damaged.

SEC. 3.—Off grades, showing any of the following, to be sold according to sample:

- A. Moisture present in excess of 7 per cent.
- B. Hulls black or moldy in excess of 5 per cent.
- C. Less than 60 per cent sound kernels and over 3 per cent damaged.
- D. Any mixture of red peanuts.
- E. Mixture of other varieties in excess of 2 per cent.
- F. Shelled nuts in excess of 2 per cent.

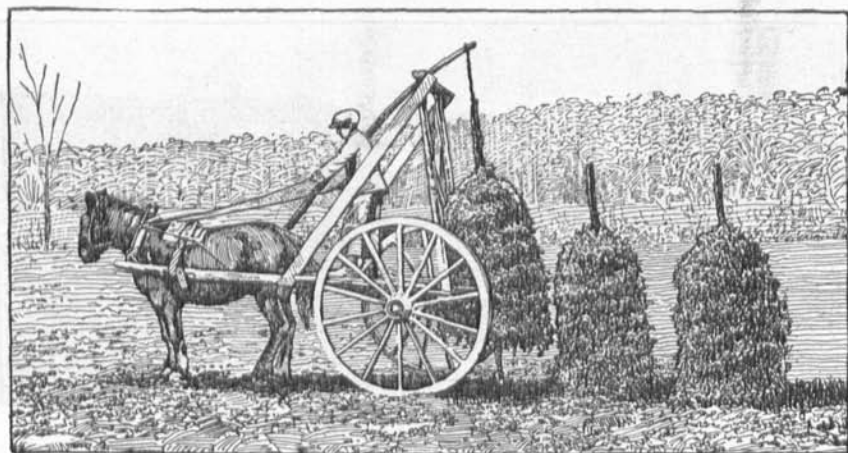


FIG. 17.—Device used for lifting peanut stacks and moving them to the picker in the field.

SEC. 4.—Mixed peanuts shall include:

- A. Any mixture of other varieties.
- B. Any varieties containing more than 2 per cent of shelled nuts.

SEC. 5.—“Sound kernels” shall mean those that are bright, mature, and marketable.

“Damaged kernels” shall mean those that are not prime in flavor, or show mold, sourness, rancidity, or are wholly or partly decomposed.

“Shelled nuts” shall mean all those that are shelled, including whole and broken kernels.

SEC. 6.—Percentages by weight shall be based on the samples of farmers' stock, hand shelled.

SEC. 7.—Deduction at the rate of delivered price shall be made for all foreign matter in excess of 1 per cent and for moisture in excess of 7 per cent.

SEC. 8.—Six samples of 5 pounds each shall constitute a fair sample to be taken from various parts of each car and two samples of 2 pounds each from a wagonload. These samples shall be thoroughly mixed, then quartered, and 100 grams shelled by hand as a basis for determining grade.



## MARKETING BY WEIGHT.

Peanuts should always be sold by actual weight rather than by the bushel. Considerable confusion has arisen from the use of the "bushel" as a measure for handling and selling peanuts. The large-podded varieties will, as a rule, weigh about 22 pounds and the Spanish from 28 to 30 pounds to the measured bushel, but these weights are not constant and vary with locality, grade, and condition of the stock. If sales are conducted on the basis of tons or hundredweight and according to standard grades, both buyer and seller will have in mind a definite standard.

## MARKETS FOR PEANUTS.

Peanut-cleaning factories and oil mills are essential in the preparation of the peanut and its products for the retail market. As the many and varied uses developed for peanuts require intricate and expensive machinery, this work can not be done to advantage on the farm. Therefore, when the farmer has re-cleaned and graded his crop and delivered it to the shipping point or to the factory in the best possible condition, his connection with the work ends.

## PEANUTS AND PEANUT BY-PRODUCTS AS STOCK FEED.

Peanuts are exceptional among southern farm crops in that every part of the plant and all by-products resulting from the factory processes through which peanuts pass can be utilized to splendid advantage mainly for stock feeding. Peanut hay and the light or inferior pods constitute the by-products on the farm; hulls, press cake, and meal result from the manufacture of peanut oil; hulls, shrunken and inferior kernels, germs, and fine particles of meats are by-products of the cleaning factories; and considerable quantities of germs, red skins, and inferior particles of meats result from the manufacture of peanut butter and peanut confections.

## VALUE OF PEANUT HAY.

Peanut hay, or the vines from which the pods have been removed, was at one time allowed to go to waste, but now constitutes a considerable portion of the farmer's profit and has a decided market value, as hundreds of carloads are sold. Where the vines are properly cured in stacks, the hay will come from the picker bright and clean, with a feeding value equal to, if not greater than, first-class clover or alfalfa hay. Sufficient attention has not been given by the manufacturers of peanut-picking machinery to providing proper attachments for handling and cleaning the hay. If these machines were provided with better facilities for separating the dirt from the hay,

less difficulty would be experienced in feeding it. By proper manipulation of the picking machines now in use much of the sand and dust can be separated from the hay and its value increased. As a rule a baling machine is employed either in conjunction with the picker or following behind and packing the peanut hay into bales. Care must be taken in baling to mix the leaves and stems so that the product will be uniform. Peanut hay should be baled when dry and the bales stored where they will not be exposed to the weather.

#### PRECAUTIONS NECESSARY IN FEEDING PEANUT HAY.

Moldy peanut hay is unfit for feeding purposes, but hay that has been properly cared for may be fed to all kinds of live stock. In feeding to mules and horses it should be fed in racks or wire-bottomed mangers, in order that any sand or dust may sift through. Cases are on record where both horses and mules have been injured by feeding either moldy or extremely dusty peanut hay, the symptoms frequently being similar to those of ordinary colic.

#### USE OF LIGHT AND INFERIOR PODS.

All light or inferior peanuts removed in recleaning and grading may be used for feeding hogs on the farm, or they may be ground, shells and all, mixed with other ingredients, and used as dairy, poultry, or hog feed.

#### BY-PRODUCTS OF PEANUT-OIL MANUFACTURE.

With the establishment of the peanut-oil industry in the Southern States, a line of practically new by-products has appeared upon the market, peanut cake and peanut meal being the most important. In the production of the highest grade virgin peanut oil, the nuts are shelled and hand picked just the same as for the confectioners' trade, and the press cake resulting is of a very high grade, containing 36 to 42 per cent protein. Where the nuts are crushed, shells and all, a lower grade cake and meal results, but even this makes a highly concentrated feed. It is estimated that with cottonseed meal selling at \$55 per ton, high-grade peanut meal is worth not less than \$65 per ton. When fed to dairy animals, peanut meal does not give the milk any peculiar flavor, as does cottonseed meal, and it can be fed continuously to hogs without any of the injurious effects produced by cottonseed meal. Peanut meal made from shelled nuts is more desirable for hog feeding than that which includes the shells.

Both peanut meal and the by-products resulting from cleaning peanuts for oil making find a ready use in the manufacture of mixed dairy feeds. The shells that were formerly burned or used as stable bedding are now ground and used as a filler in prepared feeds.

In feeding pure peanut meal, reasonable precaution should be taken as regards the amount fed, on account of its high protein content. The safest plan is to mix it with other feeds, forming a balanced ration.

#### PEANUTS AS A FEED FOR HOGS.

Until recent years the greatest use for peanuts in the Gulf coast region was for feeding to live stock on the farms. The production of peanuts for the market in that section has been a transition from the stock-feeding phase. While there may be a few disadvantages connected with the feeding of peanuts to hogs, the fact remains that they are one of the most profitable hog feeds on southern farms.

There is a wide diversity of opinion relative to the effect of peanuts in producing soft pork. In this connection it should be borne in mind that peanuts are not the only feed that produces soft pork. Numerous experiments have been conducted to determine the extent to which the softening effect of peanuts can be overcome by finishing hogs on corn or some other concentrated feed. Thus far no definite conclusions have been reached, and further investigations are necessary before there can be an agreement among investigators. However, two or three definite facts are known: (1) There is no means by which the hogs that will kill soft may be detected until the carcasses have been chilled. (2) As a rule, peanut-fed pork will shrink more in the curing processes than that fed on corn and certain other concentrated feeds. (3) The processes used in the curing of corn-fed pork are not adapted to curing the pork from hogs that have been fed on peanuts.

As long as the difference in the price paid by the packers for peanut-fed hogs is no greater than at present, namely, from 1 to 2 cents per pound, the southern farmers should fatten hogs on peanuts wherever a considerably greater quantity of pork can be produced from an acre of peanuts than of corn. It has been found in certain sections of the South that more pork could be produced per acre with corn than with peanuts, and in those cases the farmers would certainly not be justified in depending upon peanuts. The flavor and table quality of pork produced in part upon peanuts are beyond question. Much of the difficulty has arisen on account of the methods used in curing the peanut-fed pork. The Virginia housewife and the packer who make a specialty of peanut-fed hams know and apply the difference in method.

#### VARIETIES FOR FEEDING PURPOSES.

Where peanuts are grown exclusively for feeding purposes, successive plantings should be made; also more than one variety used.

The Spanish is undoubtedly the best all-round variety for feeding purposes, but has the disadvantage that the seeds are liable to sprout in the ground if wet weather occurs after they are mature. The Tennessee Red, the Georgia Red (sometimes called Red Spanish), and the Valencia have the characteristic of remaining in the ground without sprouting throughout the autumn, and sometimes until nearly spring, and for that reason are especially adapted for hog feeding. The variety known as African matures late and produces a large number of pods.

Spanish and similar varieties having an upright habit of growth are frequently mowed for hay, after which the hogs are turned in to harvest the peanuts. Another method is to first mow the tops



FIG. 18.—Peanuts growing between rows of corn.

for hay, dig and stack the greater part of the peanuts, and then turn in the hogs. Owing to their low spreading habit of growth the Virginia Runner, North Carolina, and African are not adapted for handling in this manner. In many parts of the South peanuts are planted between the rows of corn, as shown in figure 18.

#### VARIETIES OF PEANUTS.

Nine or ten distinct varieties of peanuts are grown in this country, but there are a number of hybrids, off types, and mixtures of these. The varieties known as Virginia Bunch, Virginia Runner, and North

Carolina furnish the greater part of the large-podded peanuts on our markets. According to good authority the Virginia Runner and Virginia Bunch were originally one variety, a few plants of bunch habit of growth being selected from among the runners and eventually developed into a distinct variety. The characteristics of these varieties are now clearly defined, and a number of special strains of each have been developed.

The Spanish, including the Small Spanish, medium white Spanish or true Spanish, and the Large or Improved Spanish, furnish the bulk of the shelled goods and those used for oil production. Varieties having red or dark-colored kernels are not desired on the markets, and any mixture of these with the standard white varieties lowers the grade of the latter.

*Virginia Runner* has a spreading habit of growth and forms pods both at the base of the plant and along the stems. It is rather difficult to dig without losing a few of the peanuts and to stack so that the nuts will not be exposed to the weather. This variety is grown extensively in southeastern Virginia and northeastern North Carolina.

*North Carolina* resembles the Virginia Runner except that it is smaller in every respect. It also has certain characteristics indicating that it may be closely related to the African. Peanuts of the North Carolina variety are used largely for shelling and small-sized vending stock.

*Virginia Bunch* has an upright or bunch habit of growth and the pods are formed in a cluster around the base of the plant. (Fig. 19.) It is easy to cultivate and is not difficult to harvest.

*African* is a low-growing, runner pea, requiring a long season for its maturity. It produces a heavy yield of peas, which are fairly high in oil content, but this variety has not found general favor on the market.

*Spanish* is the most important commercial variety in the South, especially outside of the Virginia-North Carolina district. The medium or true white Spanish, as shown in figure 20, is unquestionably best adapted for all purposes in the Gulf coast region and is the one most in demand by factories producing shelled goods for the market. This variety is of an upright habit of growth, has rather heavy foliage, and the pods cluster close about the base of the plants. It is easy to cultivate and to harvest.

*Small Spanish.* A variety or strain of Spanish known as Small Spanish is found in many sections in the Gulf coast region. The pods and peas are about two-thirds the size of those of the regular Spanish. It is not a high yielder, and the peas are a little too small to meet the market requirements.

*Improved Spanish.* A number of hybrids or selections from the true Spanish are known under the names of Improved Spanish, Jumbo Spanish, Large Spanish, and various other local names, their chief difference being that the pods and peas are larger than those of the true Spanish. Some of these are worthy of careful trial and cultivation, but their use is thus far confined to limited areas.

*Valencia.* The variety known as Valencia has a vigorous upright growth, with the pods clustered about the base of the plants, similar to Spanish. The peas are reddish in color and not considered desirable for shelling purposes.

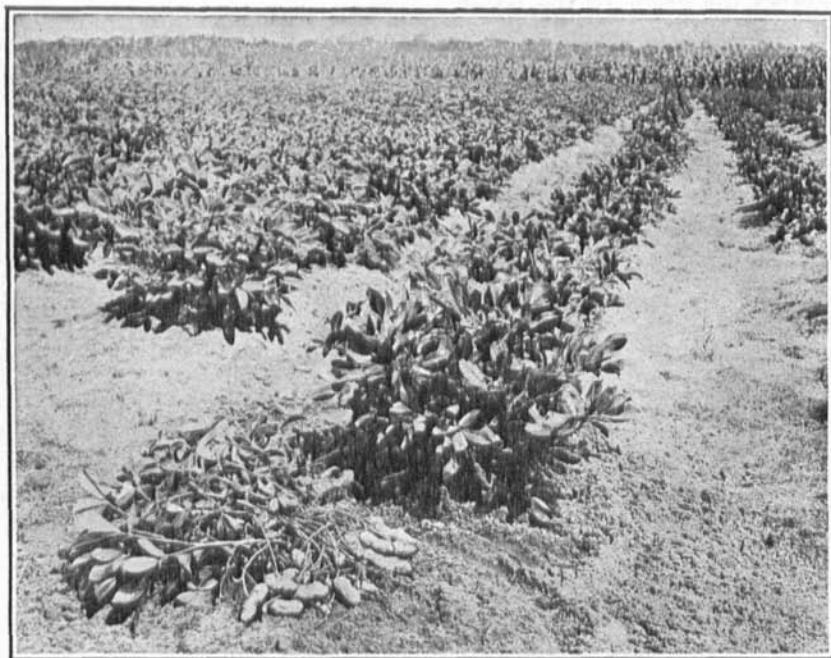


FIG. 19.—Virginia Bunch peanuts.

*Tennessee Red* belongs to the Valencia type and is possibly a cross or a selection of that variety. Its pods are extremely long and slender, with three to seven red peas in each. It is not extensively used for shelling, but is sold for roasting in the shell.

*Georgia Red*, sometimes called Red Spanish, is another variety closely related to Valencia. Its pods are short, usually containing two or three light-red peas. This variety is grown extensively in Georgia, Florida, and Alabama, especially for hog feeding.

**VALUE OF PEANUTS AS A MONEY CROP.**

Too much can scarcely be said in favor of the peanut as a money crop for southern farms wherever the character of the soil, the climate, and the local conditions are adapted to its production. The demand for peanuts is increasing as new uses and a wider market are found. In order that the grower may know where he stands as regards profits derived from his peanut crop, it is desirable that he keep a reasonably accurate account of all items of expense entering into its production.

**COST OF GROWING AN ACRE OF PEANUTS.**

It is assumed that if the cost of growing a single acre is known, the cost for the crop on any given farm may be determined with reasonable accuracy. Local conditions determine to a certain extent the cost of growing peanuts, and actual cost figures can not be given in a

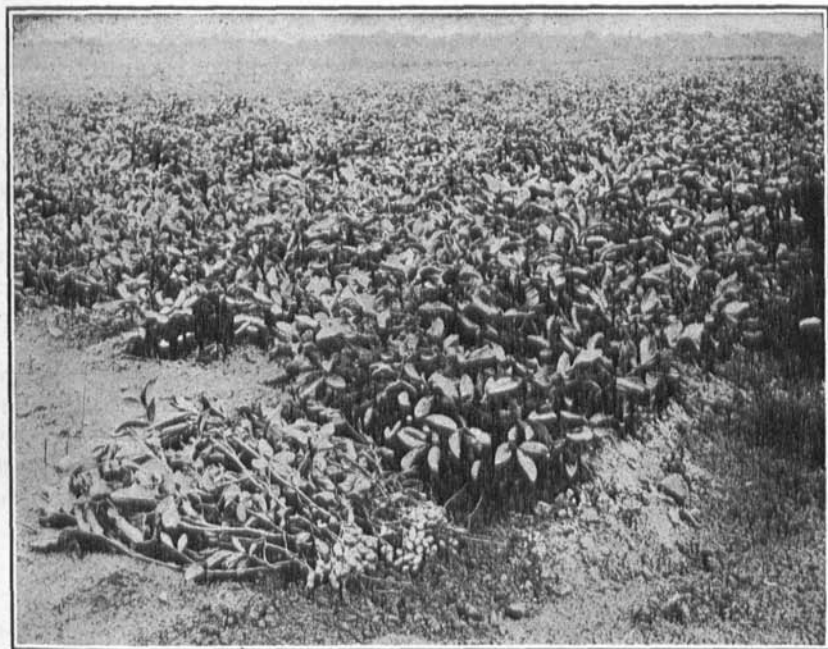


FIG. 20.—Spanish peanuts.

publication for use throughout the peanut territory of the United States. The following items are those usually entering into the cost of production :

1. Rental of land or interest on the value of the land.
2. Supervision and overhead costs, including deterioration and interest on investment in tools, equipment, and storage houses.

3. Fertilizers, lime, or marl.
4. Seeds.
5. Bags and stacking poles.
6. Labor involved in the following operations:

(The cost of hiring a 1-horse team, or a 2-horse team and a driver, may be used as a basis.)

- a. Plowing and fitting the land.
  - b. Marking land, sowing fertilizers, and planting seed.
  - c. Cultivation.
  - d. Hand hoeing.
  - e. Digging and stacking.
  - f. Picking.
  - g. Recleaning and grading.
  - h. Hauling to market.
7. Miscellaneous expenses, including any preventable losses that occur from the ravages of rats and mice and any discounts or dockages due to peanuts not conforming to represented grade. These do not form a part of the actual growing costs and should be figured rather as losses.

#### YIELD OF PEANUTS.

Latest information places the average yield of peanuts in the United States at approximately 36 bushels per acre—800 to 1,100 pounds, according to variety—or an increase of 2 to 4 bushels per acre during the past 10 years. The yield per acre is influenced largely by locality and by the experience of the grower, but 40 to 50 bushels—900 to 1,500 pounds, according to variety—is considered a fair yield per acre. Many cases are on record, however, where a yield of 1,800 to 2,000 pounds to the acre has been harvested.

#### MARKET VALUE.

Definite figures as to the market value of an acre of peanuts change from year to year. If the yield and grade are known, it will be an easy matter to apply current prices and, allowing a reasonable value for the hay and waste products, compute the value of the product of an acre. By deducting the cost of growing, net profits may be obtained.

#### COOPERATION AMONG PEANUT GROWERS.

Peanut growers' associations have been formed in a number of the more important producing localities, and this class of organization is very desirable. Through the combined effort of associations much can be done to promote improvement in the methods and results of individual growers. The big problems to-day are the securing of high-grade seed for planting, better methods of harvesting and curing the crop, and conformity to standard grades in marketing. Until recent years the peanut industry has been characterized by a lack of standards and ideals, but this condition is rapidly giving way to a system employing the best business methods of the present.



### TEN POINTERS FOR PEANUT GROWERS.

(1) Plant peanuts in rotation with corn, cotton, cowpeas, and other farm crops.

(2) Be sure your land is adapted to growing peanuts. Do not plant sour or poorly drained land to peanuts.

(3) Prepare your peanut land as though you were going to use it for a garden; then give it an extra fitting for good measure.

(4) Good seed is essential to a full stand and a profitable crop. What has been done with corn by way of seed improvement can also be done with peanuts. Have a seed patch and grow seed from high-yielding plants.

(5) Shell seed by hand, or in case of Spanish peanuts, soak the pods over night and plant whole. If troubled by moles or salamanders, treat the seed with a little pine tar.

(6) Cultivate early and often. Keep the grass and weeds from getting a firm hold.

(7) Have stacking poles ready before the crop is ready to harvest.

(8) Harvest during good weather before the vines are frosted. Cure in small stacks around poles having two crosspieces nailed to them 8 to 12 inches above the ground. There is only one right way.

(9) Allow peanuts to cure thoroughly in stacks; then pick them from vines with a machine that will not break the pods.

(10) Grade according to standard grades, pack in clean bags, and store in a dry well-ventilated storage room or building until marketed.

*Grow the best, put them up the best, and get the highest prices!*

