

Gives Excellent Growth Results

In experimental feeding tests excellent growth of animals resulted when fed a ration containing 3 parts of whole, yellow corn meal and 1 part of peanut meal as the sole sources of protein. On the other hand, with a ration containing corn as the only source of protein, nutritional failure resulted.

The value of peanut proteins as supplements to wheat proteins was similarly demonstrated. A highly digestible and palatable bread can be made from a mixture of peanut flour and wheat flour. A diet containing bread made from white wheat flour as the sole source of protein promoted growth at only one-third to two-thirds of the normal rate. A similar diet containing bread made from 25 parts of peanut flour and 75 parts of wheat flour furnished proteins adequate for normal growth.

From a nutritive standpoint, peanut meal is one of our cheapest and best protein concentrates. On account of its high content of protein it can be utilized best by mixing it with foods and feedstuffs which have a lower biological value to supplement their deficiencies. The results of scientific investigations indicate that peanut proteins have a nutritive value nearly, if not quite, equal to that of the proteins of meat, milk, and eggs.

D. BREESE JONES.

PECAN Production Expanding; Crop Now of Trade Importance Rapid extension of pecan orcharding throughout much of the South for the production of the superior thin-shelled nuts, and increased yields from

the native forest trees through the clearing out of other growth, have greatly increased the total production of pecans. Accordingly the crop has assumed commercial importance. About 64,000,000 pounds of pecans were produced in 1926, the largest crop of record, with an estimated value of about \$9,000,000. Of this crop, over 10,000,000 pounds, with a value of almost \$4,000,000, were of improved varieties.

The pecan is indigenous to the river valleys of Texas, Louisiana, and Mississippi and to the valleys of the Mississippi River basin northward to southeastern Kansas, central Missouri, southeastern Iowa, and the southern parts of Illinois and Indiana. There was no adequate commercial demand for the nuts until recently and for almost 100 years the trees were ruthlessly cut for timber or to clear the land.

The pecan tree is of sturdy growth and is long lived, and some specimens are extraordinarily fruitful. It succeeds well in the fertile river bottoms or near the coast, in situations free from excess of alkali or salt. According to the United States census, the number of trees of bearing age increased 65 per cent from 1910 to 1920 and 65 per cent from 1920 to 1925. Practically all of the gain was in trees of improved varieties.

Proportion of Bearing Trees

The proportion of trees of bearing age was 49 per cent in 1910; 54 per cent in 1920; and 50 per cent in 1925. In the native pecan

belt about 58 per cent of the trees were of bearing age in 1925, whereas in the South Atlantic and East South Central States, where the trees have all been planted, and mostly within the last 30 years, the proportion is reversed, about 58 per cent being of nonbearing age.

Wild seedlings form the great majority of pecan trees in the areas of native growth. Improved varieties are becoming common in these States, but the important commercial plantings have been made mainly in the coastal plains eastward and northward from the Mississippi to the Carolinas. Texas has about two-thirds of all the wild pecan trees in the United States. In 1926, its record year, Texas produced fully 32,000,000 pounds of nuts, or 50 per cent of the total crop. Large numbers of native trees still remain in the forests of Mississippi, Louisiana, Arkansas, Missouri, and Illinois.

In States where the pecan has been introduced most of the plantings consist of improved varieties; that is, budded, grafted, or top-worked trees. Single orchards frequently have thousands of trees and some contain 10,000 or more. In commercial pecan orcharding Georgia has shown the most striking development. Production of nuts in that State reached nearly 7,000,000 pounds in 1926.

Estimated Totals of Bearing Trees

The estimated total number of trees of bearing age, mostly improved, based mainly on census enumerations, is as follows: Georgia, 1,375,000; Florida, 280,000; and Alabama, 400,000. In addition to wild groves, Mississippi is estimated to have about 180,000 and Louisiana 50,000 orchard trees of bearing age. The total number of improved trees of all ages in the United States is estimated at about 4,500,000. More than 5,000,000 native seedling or wild trees are shown by the 1924 census, which probably fails to enumerate vast numbers of forest trees from which nuts are not regularly gathered, as well as many thousands of scattered trees for home use.

The great increase in the supply of nuts of fine quality through orchard development has brought the price down to a somewhat lower level than formerly. To date, yields per acre have mostly been well below expectations. Consequently, the heavy expenditures in planting and developing such orchards, on the assumption that high prices would continue to prevail, coupled with optimistic expectations for early bearing and heavy production, have resulted in disappointment to many who invested in such ventures. At moderate prices the market always seems to absorb the finer types of pecans, and lower prices vastly broaden the demand. Furthermore, pecan kernels are being used at a rapid rate of increase in the manufacture of various kinds of food products.

The average age at which domestic planted seedlings bear a crop that will pay expenses and a reasonable return on fair investment has been between 15 and 20 years in the Southeastern States. They have usually paid expense of gathering at 10 to 15 years. The improved trees have usually furnished a commercial crop, say a minimum of 5 pounds per tree, in about 10 years after the tree is set out, and a collectible crop in from 5 to 8 years. Improvements in varieties and in orcharding practices are tending to shorten the time.

Marketing Through Merchants

The marketing of the nuts in the native pecan belt is mostly through local merchants who ship to jobbers in the State centers or to the large handlers in San Antonio, New Orleans, St. Louis, and other cities, who redistribute the nuts or remove the kernel for use in candies or confections. The proportion of the wild crop gathered is dependent upon whether the crop is abundant or light, the price being paid, and the competing demand for farm labor, especially for cotton picking.

The industry has now reached the stage where materially increased attention to the matter of grading, and to making marketing plans more adjustable to the supply and demand situation, is greatly to be desired. Price ideas based upon a previous large crop may lead the grower to sell a moderate crop at too low a price. To hold a large crop for prices like those received for a small crop the previous year may cancel the advantage of the holiday demand or leave the nuts on the growers' hands. Frequent lack of information by growers concerning the supply elsewhere places them at a disadvantage. Selling agencies of the growers should be in position to analyze the available information and to decide these problems. Fuller information is needed by the industry concerning the prospects and production of the different types of nuts.

The logical plan of carrying over an unwieldy surplus of nuts from a season of very heavy production to be marketed the following season to supplement the expected short crop was followed with highly gratifying results on a large scale in 1926-27. Small crops usually follow bumper crops. When maturing a very heavy crop the tree tends to set relatively few fruiting buds for the next season's crop. Heavy crops are usually of good quality and the nuts keep well by the proper use of cold storage.

S. A. JONES.

PHOSPHORIC Acid of Higher Concentration Got by New Methods

During the last few years the production and utilization of concentrated fertilizer materials which contain two or more of the three essential plant-food elements—nitrogen, phosphorus, and potassium—has been the subject of considerable discussion and investigation in the principal countries of the civilized world. From the points of view of physical and chemical properties and the ease with which they may be handled on the farm, the most promising of these concentrated materials are ammonium phosphate, potassium phosphate, and potassium nitrate. A large number of fertilizer mixtures, containing various proportions of the three major plant food elements, may be prepared from these three chemical compounds.

Nitrogen and potassium are readily available in forms suitable for the direct manufacture of concentrated fertilizer materials. On the other hand, our only important source of phosphorus is the insoluble calcium phosphate that is present in bones and mineral phosphate rock. In order to utilize these insoluble phosphates in the manufacture of soluble concentrated fertilizers, the phosphorus which they contain must first be converted into liquid phosphoric acid by some chemical process.