

yet certain, but the evidence of recent experiments indicates strongly that it may be due to an infective principle residing in the roots. In each of the leading commercial varieties observed, a very small percentage of trees in badly diseased orchards appear to be resistant to the phony disease, and year after year they continue to grow normally, even though surrounded by old phony trees. This behavior has suggested the possibility of selecting resistant stocks as a control for the phony disease, and extensive investigations are being carried on at the United States peach-disease field laboratory, Fort Valley, Ga., with this in view.

There is every reason for thorough and intensive effort to control the phony disease. Although its communicability has not been definitely established by experimentations, it has already traveled 200 miles from its point of earliest recorded observation, at Marshallville, Ga., and has increased from commercially unimportant numbers 30 years ago to such proportions that at the present time it threatens a great industry.

LEE M. HUTCHINS.

PEAUNTS a Valuable Food for Man and Feed for Livestock. Peanuts are commonly associated in our minds with circuses, fairs, and gala days. That they constitute excellent feed for livestock, as well as food for man, is generally far too little appreciated. Peanuts are not nuts as the name might suggest, but with peas and beans belong to the legume family. They have, however, a nutritive value far superior to beans, with the possible exception of the soy bean. As a feedstuff, every part of the peanut plant can be used to advantage. The vines, properly cured, constitute a hay with a feeding value equal to or better than clover or alfalfa. Shelled peanuts contain from 40 to 50 per cent of a highly digestible oil that compares favorably with olive oil for culinary purposes. The press cake which remains after expelling the oil from whole peanuts, and which is generally ground and marketed as peanut meal, contains from 34 to 38 per cent protein; and when it is obtained from choice shelled peanuts, may contain as high as 58 per cent. Peanuts are also a good source of vitamin B.

The nutritive value of a protein is dependent on two factors, its digestibility and quality. Scientific experiments have shown that peanut proteins are not only highly digestible but that they rank among the highest in quality. The so-called nutritional quality of a protein depends on its chemical composition. Most proteins when digested yield 18 or 20 substances called amino acids, several of which are essential for the normal growth and nutrition of animals. Proteins of poor quality are those that are lacking or deficient in one or more of these essential amino acids.

Work recently done in the Bureau of Chemistry and Soils has shown that peanuts contain two proteins—arachin and conarachin. Both of these proteins contain all of the known essential amino acids. Arachin is conspicuously high in lysine (5 per cent), and conarachin, in cystine (3 per cent), two of the essential amino acids. The chief proteins of the cereal grains are deficient in lysine and cystine. Peanut meal or peanut press cake therefore serves as an excellent concentrate for mixing with corn or cereal feeds to supplement their deficiencies.

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