PROCEEDINGS

OF THE

CARIBBEAN FOOD CROPS SOCIETY

TENTH ANNUAL MEETING
PUERTO RICO

1972

VOLUME X

PEANUT (ARACHIS HYPOGAEA) CULTIVATION IN JAMAICA WITH SPECIAL REFERENCE TO DRY FARMING TECHNIQUES AND RESPONSE TO FERTILIZERS

H. W. Payne
Agronomist, Field Experimental Program, University of the West Indies, Jamaica

INTRODUCTION

In Jamaica, there is widespread disenchantment with agriculture. Agriculture by far the biggest employer of labour (about 40% of the labour force) contributed less than 10% to the gross domestic product. It is, therefore, not surprising that the country's youths abandon the land and migrate to the cities and industrial centres in search of more remunerative employment. While unemployment mounts, (190,000 or over 20% of the labour force) only the old (the average age of farm operator is 55 years of age) remains on the land and with their decline, land productivity falls.

With a rapidly increasing population (now slightly under 2 million with a yearly growth rate of 2%, Jamaica is confronted with an increasing annual food import bill. As earnings from the prosperous Bauxite and Tourist industries come into Jamaica, an increasing amount has to go abroad again far the purchase of food. This situation is particularly regrettable as it is generally accepted that more intensive and proper land use involving improved cultural practises in crops of proven suitability to conditions of Jamaica could lead to a substantial saving (estimated at over 40%) of foreign exchange for food. Of the host of crops used in the domestic food supply, the most urgent need for increased production exists in those capable of supplying protein. An excellent example is provided in peanuts.

Like so many other territories of the Third World, the dietary standards of the populace of Jamaica - about one child in every five is under-nourished-need urgent attention. Peanuts is one of the richest body building foods enjoyed by mand and increased consumption of this product in any of its numerous forms could do much to close the "protein gap."

Sophisticated products of peanut such as peanut butter and Jams are generally outside the financial reach of the populace of Jamaica and peanut consumption is mainly in the form of the whole nut. The demand for this product is quite high. The minimum guaranteed price for unshelled peanuts is J$2.75 per bushel (20 lbs.) and it is not uncommon for the product to retail at twice the guaranteed price. Locally produced peanuts, sold as parched unshelled nuts by numerous vendors meet about half of the quantity utilized. Canned peanut supply the remainder. Canned peanuts (the canning of whole peanuts is done locally) is entirely dependent on imports which amount annually to about 500 tons of shelled nuts valued at J$163,000.

Table 1 shows estimated acreage of combined Spring and Fall plantings, level of yield per acre and annual total production for the five year period 1967-71.

TABLE I

	1967	1968	1969	1970	1971
Total acreage of Spring and Fall plantings	1220	1870	1640	1540	2850
Approx. yield per acre (lbs. shelled nuts)	735	615	585	705	750
Approx. Production (short tons)	450	575	480	540	1070

Source: Agricultural Planning Unit, Ministry of Agriculture, Jamaica.

Peanuts - A possible agro-industry

Extensive field observations and experiments carried out in the parish of St. Elizabeth, the area entirely responsible for Jamaica's peanut production; indicate that adoption of improved techniques alone would increase present yield level of peanuts from 450-750 to 1200-1500 lbs. shelled nuts per acre. Such an increased yield from present acreage devoted to this crop would therefore satisfy local demands for this crop and result in a saving of foreign exchange for Jamaica. Much greater horizons can be achieved. There exist in St. Elizabeth hundreds of acres of land suited to the production of peanuts which at present are either idle or underutilized. The interest in this crop is there and employment is required. Any such expanded peanut industry would take advantage of export or process opportunities.

ST. ELIZABETH - THE PEANUT PARISH OF JAMAICA

Peanut production is entirely in the hands of numerous small farmers and thus cultivation occurs in small patches seldom larger than an acre in size.

Although peanut patches occur in almost every district of St. Elizabeth, cultivation is concentrated within the traditional areas depicted. Two main areas known as the Barton/Newton area and the Pedro/Hounslow area are primarily responsible for St. Elizabeth peanut production. These areas differ markedly in their ecological conditions. The Barton/Newton area experiences greater and evenly distributed rainfall and as a consequence two crops - a Spring crop planted in April/May and a Fall crop established in August - are generally obtained in that area. The Pedro/Hounslow area on the other hand, is distinctly drier and a Spring crop responsible for only 25% of the area's production is a very risky undertaking unless irrigation water is available.

Three major soil types are involved in peanut production. The Chudleigh Clay loam or Brown Bauxite (Map #73) in the case of Barton/Newton area and the Newell loam (Map #67) and to a lesser extent the St. Ann Clay loam or Red Bauxite Map (#78) in the case of the Pedro/Hounslow area. The Regional Soil Survey (II) carried out by University of the West Indies gives the following approximate acreage of these soils occurring in St. Elizabeth.

Soil Type	Acreage
Chudleigh Clay Loam	19,500
St. Ann Clay Loam	45,000
Newell Loam	7,200

The main characteristics of these soils (See Appendix for complete profile descriptions) well structured, exhibit good internal drainage and high lime status, explains their popularity for peanut production.

Rainfall increases considerably as one travels inland from the sea; however, the humidity remains very low as the entire area is subjected to strong drying-out winds. The coastally located Newell loam is more retentive of moisture than the inland Chudleigh Clay loam with its very rapid internal drainage. This fact tends to compensate for differences of rainfall. It is the low humidity conditions of St. Elizabeth that is a blessing in disguise for peanut production. The 4 month growing period of peanut is sufficiently short to coincide with periods of seasonally distributed rainfall. The result is that the crop gets the moisture required in its early stage of growth but yet experiences dry conditions at harvest of vital importance to the proper curing (wind rowing) of nuts without incidence of Aspergillus flavus - the causative fungus of Aflotoxin. In essence, both soil and climatic factors combine in the parish of St. Elizabeth to create conditions very favourable for peanut production of high quality and set this area apart as the peanut producing parish of Jamaica.

TRADITIONAL METHODS OF PEANUT CULTIVATION IN ST. ELIZABETH

In spite of the popularity of the peanut crop among small farmers of St. Elizabeth because of high cash return that can be made within 4 months, the standard of husbandry generally employed in its cultivation is deplorably low. Extension methods for changing farmers' attitudes call for protracted gains - "customs diehard."

Planting Practices

Most peanut stands represent a mixture of two erect bunch types known as Spanish (distinct green stems) and Valencia (thicker stems with light reddish or purple tinge). Although it is usually desirable to have pure varietal stands, there appeared to be no particular disadvantage occurring from this mixture of plants of similar habit, period of maturity and even yield. In most cases, there was no systematic crop rotation of the area devoted to this crop. On the approach of the planting season, last year's peanut plots which had been abandoned to bush fallow and grazing was hurriedly prepared usually by contract tractor operators. Their tillage operations often left much to be desired and on occasions the seed bed was less than 4 inches in depth. Furrowing was usually carried out by a muledrawn home-made device that scratched the soil to a depth that barely permitted covering the seed. The distance between rows thus created was highly variable ranging from less than 12 inches to over 20 inches according to the wondering attention of the young boy that guided the mule. The distance between seed within the row as dropped by women assisted by their children was equally variable (from 2-8 inches apart). All these factors combined with questionable quality of unselected and untreated seed to produce patchy and uneven germination.

Crop Maintenance

Satisfactory levels of weed control were generally obtained by two hoe weeding and moulding operations customarily carried out prior to the "closing in" of the crop and the formation of gynaphore (pegging). The frequent failure to fertilize was reflected in symptoms of soil fertility depletion being manifest in small farmers' peanut cultivation. Particularly common was the chlorotic condition of nitrogen deficiency while lack of plant vigor revealed the need of phosphate. Neglect of spraying resulted in a host of pests being prevalent in most peanut stands. Damage by various leaf eating and sucking insects - Leaf Beatle (Chrysomelids sp.), White grubs (ligyrus tumulosus), Aphids (Acyrthosiphon pisum) were the most common. Under these conditions the crop was also affected by Peanut Rust (Puccinia arachidis)and a number of leaf spot species (Cercospora personata C. aracbidicola). However, in spite of these infestations, the crop generally appeared surprisingly vigorous or tolerant.

A PACKAGE OF IMPROVED CULTURAL PRACTICES

As a result of representations from the Peanut Growers Association through the Santa Cruz Land Authority, the body responsible for agricultural development in the parish of St. Elizabeth; a joint project was undertaken in 1970 by research personnel of the Ministry of Agriculture, Jamaica and the Faculty of Agriculture, University of the West Indies. The specific objectives of this project was to implement multidisciplinary research into all aspects of peanut cultivation and pending the findings of research to set out available technical information that would serve as a guide to farmers. The merits of these provisional recommendations were to be immediately assessed on a number of carefully selected and controlled plots, each of about one acre in size, occurring on farmers holdings, representative of the varying conditions that obtain.

Provisional Technical Guide

The information provided sought to explain briefly "the what, how and why" of peanut cultivation. Only the main features are set out below:

Land Preparation: Thorough deep seed bed preparation (at least 9 inches) was carried out well in advance of planting. Intervals between tillage operations were sufficiently long to permit weathering to a fine tilth. Crop rotation was observed.

Fertilizer Placement and Crop Establishment: Shallow furrows 3-4 inches in depth and 18 inches apart were created across the slope. A complete fertilizer mixture (12.24.12 at the rate of 4 cwts. per acre) was placed in a continuous band, at the bottom of the furrow. The fertilizer was covered by partly closing the farrow and the seed distributed 3-4 inches apart in the row and uniformly covered to a depth of one inch.

Crop Protection: Weed control involved the use of a pre-emergence herbicide (Dymid 2 1/2 lbs. + Gesagard (50% w.p.) 1 lb. in 40 gals. of water with Gramoxone at 1 part per acre) where young weeds had emerged. Hoe weeding assisted the maintenance of absolutely clean conditions. Pest control involved the use of selected treated seed (1 part to 4 parts of dieldrin 80% w.p. and Orthocide 50% Captan). Soil treatment with a long lasting insecticide, Chlordane 2 pints per 100 gals. per acre and fortnightly spraying with a "cocktail" mixture of a fungicide and insecticide - Dithane M45 or Manzate D at 3 lbs. per acre and Sevin or Dipterex at 2 lbs. per acre. Triton stickers at 4-8 ozs. per 100 gals aided adherence. Where aphids and other sucking insects proved a problem, Malathion or Rogor was substituted for the standard insecticide. Spraying was carried out fortnightly and/or as required as judged by inspection.

Experienced Gained From Observational Plots

The crop performed extremely well on all sites selected and proved of great extension and educational value. The average yield realized was 1,500 lbs. of shelled nuts per acre or slightly more than double that normally obtained under small farm condition. It is interesting to record that certain practices of a soil and water conservation nature appeared particularly advantageous in those areas in which moisture was considered the limiting factor.

Bare Fallowing of fully prepared land: Weathering to a fine tilth was facilitated and inspection indicated that there was a build-up of moisture at depth. Earliness of land preparation proved a great advantage in the timeliness of plantiug with the outset of seasonal rains. There was also less incidence of pest damage on plots experiencing early land preparation.

Fertilizer placement below the depth of planting: The peanut plant is known for its ability to benefit substantially from residual fertilizer. However, with the soils concerned (particularly the St. Ann Clay Loam) in which phosphate fixation is a recognized problem, this method of application involving a fertilizer high in phosphate (12.24.12) and carried out at planting ensured vigorous rooting and maximum opportunity for moisture nutrient uptake.

Plant populations of moderate density: Although much higher population densities than the one selected (4 in x 18 spacing) would be possible with advantage under irrigation, the reduced plant population was an advantage where moisture was limiting. Small farmer practice of inter-planting peanuts with Maize or red peas (P. Vulgaris) was associated with reduced yield.

CONCLUSION

It appears that economic production of peanuts calls for a high degree of management if satisfactory yield levels are to be obtained. Although it remains for research to fully establish the economic benefits of various levels of management, there is available in Jamaica a "package" of cultural techniques that if adopted by farmers, would double the general level of peanut production in St. Elizabeth. The immediate impact of improved cultivation of peanuts would be a saving of foreign exchange for Jamaica.

BRIEF DESCRIPTION OF PEANUT SOILS OF ST. ELIZABETH

Newell Loam Map No. 67

Soil Properties		Nutrient Rating		
Depth	- Very Deep	Nitrogen	-	Low
Reaction	- Slight acid to medium acid	Phosphate	-	Low to Medium
Moisture retention	- Medium			
Internal drainage	- Moderate	Potash	-	Low

Chudleigh Clay Loam Map No. 73

Soil Properties		Nutrient Rating		
Depth	- Medium to very deep	Nitrogen	-	Low
Reaction	- Slightly acid	Phosphate	-	Medium
Moisture retention	- Fair			
Internal drainage	- Very rapid	Potash	-	Very low

St. Ann Clay Loam Map No. 78

Soil Properties		Nutrient Rating		
Depth	- Medium to very deep	Nitrogen	-	Medium
Reaction	- Neutral to slightly acid	Phosphate	-	Very low
Moisture retention	- Low			
Internal drainage	- Extremely rapid	Potash	-	Low