I. INTRODUCTION

Spacing

As groundnuts are grown in Trinidad scarcely if at all it was somewhat in the nature of an experiment in itself to see how they would grow and produce on the not altogether suitable soil of the College Old Farm.

Over the world groundnuts are grown in a fairly wide range of conditions of soil and climate, and though fertilizer requirements seem fairly standard in principle there is a wide range of spacings used and recommended. Because these reflect conditions of climate and soil texture the experiments involved here can only be expected to give results of local value.

In general it seems that wide inter-row spacings (i.e. 3-4 feet) are used in dry regions, light soils, and for mechanised large scale cultivation. Allowing for this it is perhaps easier to make comparisons in terms of number of plants per acre. For Queensland, rainfall 25" in a fairly well defined wet season, soil sandy and with mechanical cultivation, plant populations may be as low as 8,300 (Kerr 1954) but may be as high as 52,300 for bunch types of groundnuts, while 29,000 per acre is quoted (Allen) for runners. Here spacings range from 36" between rows with up to 21" between plants, to 30" between rows and 4" between plants. As in other areas the closer spacings are now recommended. Experiments in Northern Nigeria, where conditions of rainfall and soil texture are similar, suggest that 26,000 per acre is optimum (Nigeria 1952-53) though, commonly, lower densities are found in practice (approximately 19,000). In this case production is in the hands of peasant farmers but rows may be as wide as 4 feet apart though cultivations are by hand. The great difference between the suggested spacings and populations of plants per acre for

Queensland and Northern Nigeria is probably due to differences in fertiliser practice, a greater use of artificials being made in Queensland for instance.

In the U.S.A. (Alabama, Georgia and North Carolina in particular) many acres of peanuts are grown on sandy loams and with the highly mechanised cultivation practised distances between rows tend to be wide i.e. at least 30". Formerly spacing was 4 ft. to allow for inter-row cultivation by mules. Thus, plant populations have been as low as 11,600 though rainfall is at least 50". Experiments have shown (U.S.D.A. 1927) that best results would be obtained with about 70,000 plants per acre. This was the maximum density tested, obtained with rows 30" apart and 3" between plants. Results of experiments in other countries suggest the possibility of better yields with even higher populations. For example, in Uganda a number of experiments were carried out (Uganda 1933,34) in which trials were made with populations of 10,800, 21,800, 43,600, 74,450, 97,100, 174,200 plants per acre.

1933 (a)
Trial with spacings 2' x 1', 1' x 1', 9" x 9".

The last two gave significantly greater yields than the first, but the difference between these two was not significant. 1' x 1' = 43,600 plants per acre.

(b) Trial with spacings 1' x 1' and 9" x 9".

The latter gave better yields. 9" x 9" = 77,440 plants per acre.

(c) Trial with spacings 1' x 6", 6" x 6".

The latter was apparently the better spacing for runners.

1934 (a). In a spacing, mulching and variety trial, spacings 1' x 1', 9" x 9", 6" x 6" were tested (i.e. plant populations 43600, 77440, 174240 per acre). Bunch types gave better yields than runners, and yield increased with plant population.

(b) Treatments used were spacings 2' x 2', 2' x 2' (mulched)

1' x 1', 6" x 6"..

Yields were (shelled nuts per acre):-

490, 625, 1100, 1390 lbs., with a least significant difference of 440 lbs.

Thus it would seem that for Uganda conditions - rainfall 50 - 55", good soils - there is nothing to be gained by using spacings greater than 1' x 1'. Whether closer spacings should be used will depend on the return which can be obtained for the additional seed needed.

High populations similar to those recommended for Uganda, where in fact ground nuts are quite commonly broadcast at a seed rate of approximately 100 lbs. per acre, are suggested for the Central Provinces of India (Dept. of Agric. Bull. No. 22). i.e. 130,700 - 174,200 plants per acre, from spacings 1' x 3-4" and a seed rate of 30 - 80 lbs. per acre (I doubt that. With 100% germination and 'take' 160,000 plants would need at least 180 lbs. seed).

Elsewhere spacings are arranged to give populations as follows:-

Jamaica - With a rainfall of the order of 70", the extension service recommendation is 21800 (2' x 1').

South Africa - (Selschopp 1947) - rainfall 25 - 45". The general recommendation is 28000 - 49000, with 58,000 in areas of good rainfall.

East Africa (for the Groundnuts Scheme) 44700 - 54600 (28" x 3-5").

Philippines (Rodrigo 1949) - 9,700 - 28,000.

Malaya (Hartley and Keeping 1950) - 43,600 (1' x 1') obtained from a seed rate of over 100 lbs. per acre allowing 2 seeds per "hill".

Ollagnier (1952), reviewing spacings used in French Equatorial Africa, French West Africa, Nigeria, Belgian Congo, Tanganyika and the U.S.A. found that plant densities usually were

from 16000 - 51000 per acre, but that the optimum for fertile land was 100,000. Close spacing gave better control of weeds and also of rosette virus by its inhibiting effect on the vector (Aphis laburni).

Work at Senegal (rainfall 10" - 25") suggests an optimum for that region of 32000 - 44000 plants per acre. In fact according to Bouffil and Jeandel (1949) native cultivators obtain populations of about 33000 by planting in rows 19" apart, with 9.5" between plants. This is in contrast with Northern Nigeria where rows are wider apart (3' - 4') and densities lower (19000).

It is of interest that the West African Oilseeds Mission (1949) recommended that spacings should generally be closer than they are in practice. Similar recommendations have been made for the U.S.A. areas of production. York and Godfrey(1951) recommend that for bunch types populations be increased from 24,900 to 37,300,and for runners from 21,400 - 24,900,to give a yield increase of 30%. Whether or not such increases in yield are obtained depends of course on the provision in fertilizers of the necessary plant nutrients, particularly of phosphate, potash and calcium.