Rural Broadcasts :

II.—SOIL TYPES, OTHER FACTORS AND SELECTIVE PLANTINGS

IN the previous talk in this series we stressed the value of careful attention to coconut seed selection, new plantings or replanting and described the process of selection. At the close of the talk we had begun to discuss the selection of planting sites and the suitable soil types and had stated that generally heavy clay soils, steep and sloping land, red soils, particularly red clays, gravelly or rubble soils and sour and acid sands were unsuitable for coconuts.

Soils Suitable for Coconuts.—

Generally speaking, the soil requirements of coconuts are for a deep and well-drained soil of at least moderate fertility. Soil moisture conditions are of the utmost importance. Coconuts will tolerate quite sandy soils, provided they have correct subsurface water conditions. Soils should be free-draining to a great depth for the best results and, therefore, the deeper loams of volcanic deposits are generally the most favoured.

Better types of coconut soils in the Territory are as follows :—

Volcanic Soils.—

These fall into two classes.

Firstly pumices and similar soils such as are found in the Gazelle Peninsula area, New Britain, in parts of Bougainville and north coast of Papua, around Collingwood Bay and the Soputa-Dobadura-Sangara area and on the south-east coast of Papua in patches. These soils are very light, free and porous and are of high fertility. They generally provide excellent conditions for coconut cultivation except in cases where subsurface bands of lava interfere with drainage as occurs in part of the area associated with Mount Lamington.

Secondly the soils formed by weathering of volcanic lavas are found along the north coast of New Britain in the Talasea Subdistrict and on islands off the north coast of New Guinea, such as Kar Kar and Manam. The suitability of these soils depends largely on their degree of maturity and depth of weathering. Where fairly matured and deeply weathered these highly fertile soils give excellent conditions for coconuts. However, in some cases over the newer deposits of lava, they are shallow, with a tendency to be puggy close to the surface, or not to retain water well and give less valuable soils.

Alluvial Soils.—

These soils are found associated with major river deposits and once again can be high in fertility and very satisfactory as far as soil moisture conditions and drainage are concerned. Throughout the Territory coconut plantings are found at the mouths of streams on this sort of soil but there has so far been so very little exploitation or testing of alluvials along the inland portions of the major rivers. Unfortunately, owing to the fast-flowing nature, many of our streams and their alluvial deposits are marred by gravel or rubble bands which make them most unsuitable for coconuts.

Old Beach Sands.—

This group can be divided into two important types. Firstly, old beach sands which consist largely of the seaward deposits of river systems largely thrown back by the sea on to marine beaches giving very often a quite satisfactory soil for coconuts. Many valuable plantations along the south coast of Papua are planted on this type of formation. Secondly, beach sands of predominantly coral sand structure which are associated with old reef formations and are to be found in areas such as the western end of New Ireland, and on many coral atolls. These sands have a very variable history as far as the response of coconuts goes, and results with coconuts seem to depend largely on subsurface moisture conditions; where water is free-moving beneath these sands coconuts have done very well. However, where there is locked or stagnant subsurface water, the results have invariably been early mortality.

Coastal Soils with Fissure Coral Formations.—

In many parts of the Territory coconuts have unexpectedly done well on this sort of country, particularly when the shallowness of the soil itself in such areas is taken into consideration. The formation usually consists of a platform of raised coral extending back from the sea with a shallow deposit of soil on top. The soil itself would appear to have no resistance to desiccation but it is thought that the coconut roots are able to penetrate the subsurface coral formation where water is stored.

Other Factors in the Selection of Land for Coconut Plantings.—

Some thought should be given to climate when considering coconut planting and, in particular, rainfall. The distribution of rainfall throughout the year greatly influences its effect on coconuts; however, under normal tropical conditions of alternate dry and wet seasons rainfalls should not be below 65 inches and preferably not higher than 150 inches and areas with excessively long dry seasons, e.g. seven and eight months, should be avoided. Some of the dryer areas have land suitable for coconuts by reason of good subsurface moisture conditions, influenced by rivers or underground water. Some areas have a definite history of recurrent drought with damaging effects on crop yield and particularly where the soils are shallow or heavy such areas should be avoided. Generally the very wet areas do not give the best results with coconuts and there are other undesirable features for commercial copra production such as difficulties in the drying and storage of copra.

Altitude is also a factor to be considered and generally speaking areas with altitudes greater than 500 feet should not be considered although it is to be noted that coconuts do very well in certain localities which are very fertile, such as the pumice belt of New Britain at an elevation of 1,000 feet or more.

Selective Planting of Estates.—

Within a good area which has been selected for planting up of coconuts, it will pay the planter to make a careful examination to determine whether all, or part, of the land should be planted. This is particularly so in this Territory where the coastal soil types are extremely variable and even within a reasonably small area, say 1,000 acres, on country generally suitable for coconut planting, it will be found that there are considerable patches of unsuitable land. The natural vegetation is often the best indicator of such poor patches. All land which has stunted vegetation, or otherwise abnormal natural cover, e.g. the predominance of pandanus palm, sago palms, nipa palms or other swamp vegetation should be avoided. Comparatively little observation would serve to familiarize the prospective planter with the general appearance of normal forest cover in any area and enable him to detect abnormalities. Particularly, in the German times (1896-1914) when many of the existing stands in the Territory of New Guinea were planted the plantations were not established by the ultimate occupier, but were planted under contract and large areas of country were simply planted up without any regard for local soil variations. Thus many plantations in that Territory to-day will be found to consist of a portion which is highly productive and another portion which has little or no production. It must pay the modern planter to only plant up those areas which will ultimately give him satisfactory yields. Any money spent in the planting, or early maintenance of unsuitable lands is so much money down the drain.

Soil-water relationships, related to subsoil conditions, are among the main factors affecting healthy coconut production. Undesirable subsoil with rock hard pans, ironstone hard pans, waterlogged due to stiff clay subsoil or swampy conditions, can all lead to conditions of physiological drought or cause real inability for the palm to get sufficient water and nutrients to give full healthy growth. Such shows up in unhealthy conditions in the palm canopy such as taper stem, yellowing or chlorosis; leaf break; leaf droop (i.e. dead leaves hanging around the stem) and can even cause a severe wilt under extreme conditions.