

Sl. No. [1962]

RECONNAISSANCE SOIL SURVEY
ON THE PROPOSED TEA ESTATE
OF FUNDONG NEAR NJINIKOM

(B 12, B 13, B 14, B 15
B 16, B 17, B 18, B 19
B 20, B 21, B 22)

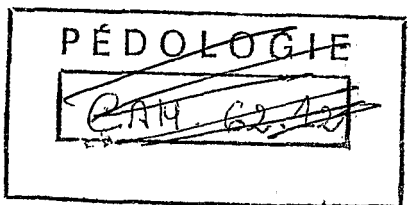
G. SIEFFERMANN

The observations in the field, the soil sampling were made by G. SIEFFERMANN, pedologist of IRCAM. As the field worker was away when the analytical results were available, the comments hereafter were written by P. SEGALEN, chief of the pedological section of IRCAM. A more complete report will be written when G. SIEFFERMANN is back in Yaoundé.

I Environment.

The estate under study is situated along the road leading from Njinikom to Laakon at about 6 miles from Njinikom. The altitude varies from 4000 to 4500 feet.

The climate is supposed to be much alike that of Bamenda where the rainfall is 103.6 inches and the mean temperature near 70 F. The year is divided in two periods : Nov to April when rainfall does not exceed 25 ins and Mai to October when rainfall amounts to 80 ins. The vegetation is mostly made of grasses (Stenobolus, Hyparrhenia etc) and some forest. Fulani cattle graze in the grasslands. The rocks the soils are derived from, are essentially basalt. Probably different volcanic systems could be distinguished as in Bamam area in the east^{er} Cameroon. But no time was available to recognise different formations and geological information was scanty. Most certainly, the land under study derives from old or very old basalt.



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The topography is gently rolling with 5 to 10 % slopes. Steeper slopes are seldom encountered.

Drainage is convenient on the slopes. In some bottom lands, it is somewhat impeded.

II The Soils.

The soils under study will be referred to as Ferrallitic Soils for the following reasons :

- 1) they have fully developed A B C profiles with reddish - brown to red brown B horizon
- 2) in some places concretions and laterite can be observed
- 3) the base exchange status is rather low ; with a very low total exchangeable bases / Base exchange capacity ratio : 0,05 to 0,20.
- 4) the constituent of the mineral bulk soil was essentially gibbsite

with hardly any kaolinite or other clay mineral. Very often the silt content of these soils are high with a silt / clay ratio varying from 0,5 to 1,0. However this does not question the ir position among the ferrallitic soils as the mechanical analysis is uneasy to perform accurately in these soils (this is very often noted in soils derived from basic rocks). The very high organic matter content, (both C and N), and the laterite will be considered to divide these ferrallitic soils in two great soil groups : the humic ferrallitic soils,

the indurated ferrallitic soils

no other subdivision will be attempted for the moment.

1) The Humic Ferrallitic Soils present the following morphological features :

Profile N° B 12 ; Vegetation grasses ; slope 10 % ; Parent material : basalt.

0 - 10 cm Dark brown ; silty clay ; crumb structure ; friable

10 - 70 Reddish brown ; sandy clay ; nutty ; friable

70 to 300 Brownish red ; clay ; compact.

Analytical data.

Surface soil 32 % clay 36 silt

pH 5,7 - Exchangeable bases very low : 2 meq/100g

mineral reserve : some calcium and magnesium ; very low in potash, medium in phosphoric acid.

Organic matter 16 % very high, Nitrogen 2,8 %.

Sub Soil 60 - 70 % clay, 13 - 16 % silt.

pH 5,8 - Exchangeable bases very low : 1,5 meq./100. Mineral reserve : some calcium and magnesium ; Phosphoric acid medium.

In these soils there are hardly any concretions or laterite. Other profiles present the same dark colour and same textures, but base status may be better (calcium and magnesium especially). Organic matter and nitrogen are always very high.

2) The Indurated Ferrallitic soils.

The following profile has been noted :

B 16, grasses, flat land.

0 - 10 cm Dark reddish brown ; sandy clay ; crumb structure ; friable ;
some concretions

10 - 20 cm Dark brown ; sandy clay ; crumb structure ; friable ; large
number of concretions

50 - 200 cm laterite, compact, somewhat impervious.

Analytical data

Surface soil

50 % sand 32 % silt 18 clay

pH 5.8

high in organic matter : 14 % and Nitrogen : 5 %

Base status quite low.

Mineral reserve low to very low

phosphoric acid medium to good

subsoil : laterite rock bed

A number of profiles are identical to the one described above & a friable layer of 30 to 50 cm and underneath laterite rock.

III Suitability for tea cultivation.

a) General requirements. The general conditions for good tea growing seem to be the following : a rather mild climate devoid of frost and with a rainfall between 70 and 150 inches. Distinctly acid soils, well drained, easily penetrated by the root system. To begin with, it seems that the low nutrient content will not hamper the development of the tree ; gentle slopes are recommended.

b) Suitability of the proposed estate.

The general requirements concerning climate and land configurations are met on the estate.

As regards soils :

The bottom land soils and the indurated ferrallitic soils must be discarded for they do not meet the requirements concerning good drainage and easy root penetration.

The humic ferrallitic soils seem on the other hand to be suitable for tea plantation. Texture and pH are good ; organic matter is abundant. However planting holes must be deep and large to enable good root penetration in the subsoil. As the fertility level is rather low, application of fertilisers may become necessary to give better yields.

Contour cultivation is recommended to refrain erosion. However it seems useful to point out that good surface drainage conditions may be made necessary, as the very organic top soil may retain much water.

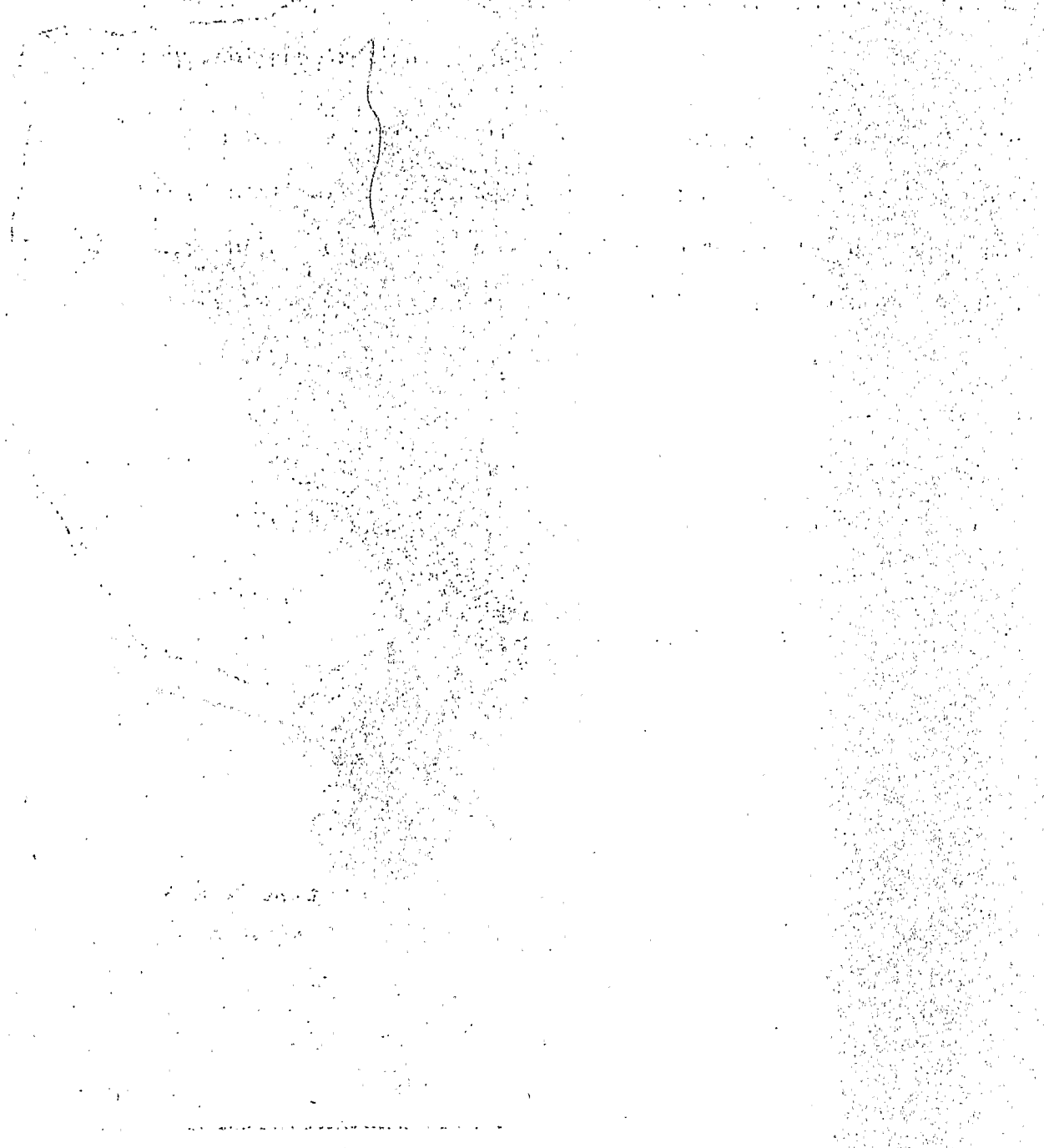
IV Conclusions.

A survey on the Fundong estate near Njinikom has been carried out and soil samples analysed.

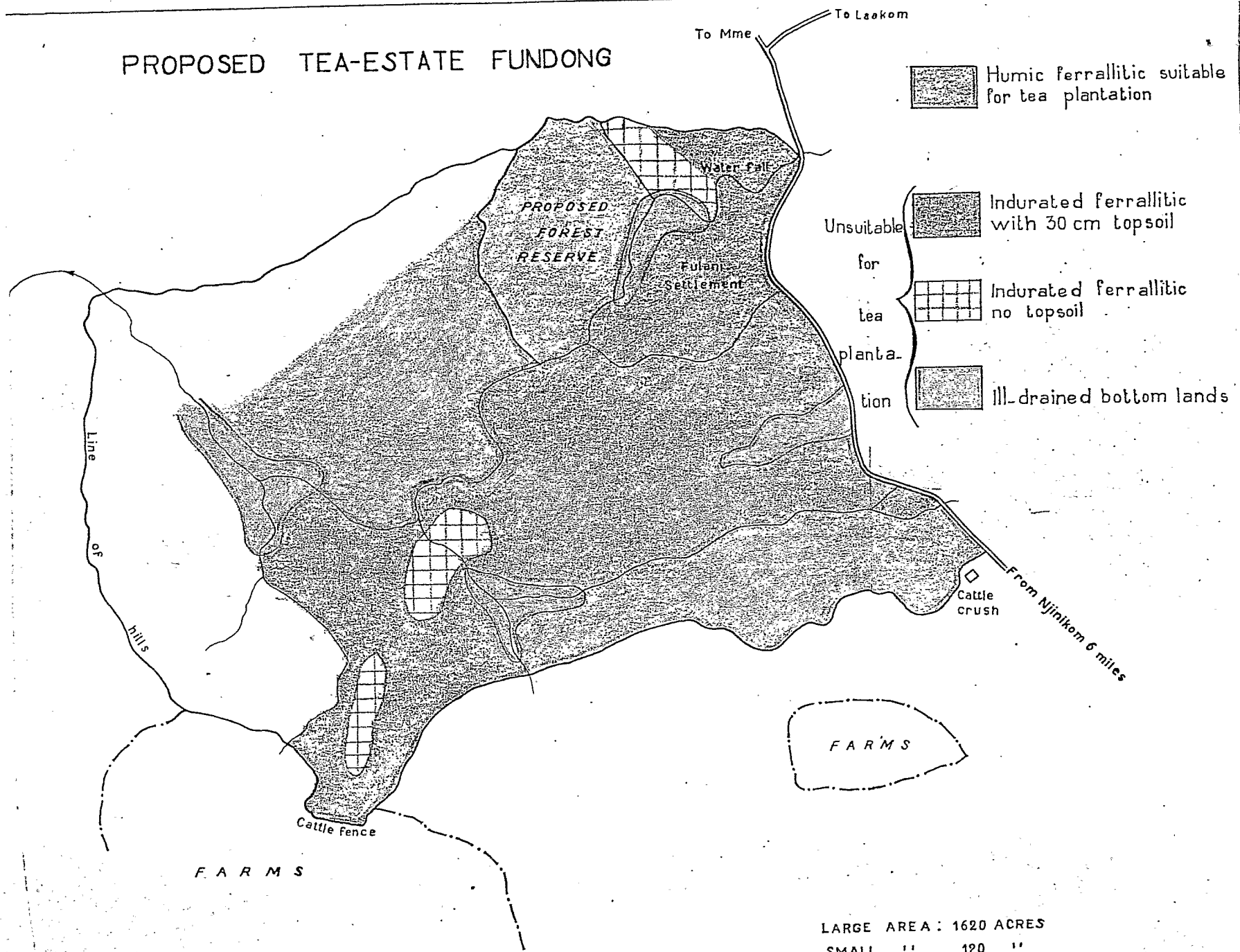
Two main soil groups derived from basalt (humic ferrallitic and indurated ferrallitic) have been encountered.

Humic ferrallitic soils seem to be suitable for tea plantation. Indurated ferrallitic and bottom land are unsuitable.

The most convenient soils have been marked in green on the map. They representy 1/3 of the area under study. It is suggested that more land should be examined both to the north and to the south to find more humic ferrallitic soils.



PROPOSED TEA-ESTATE FUNDONG



LARGE AREA : 1620 ACRES
 SMALL " 120 "
 SCALE: 3.75" to 1 MILE