THE USE OF LIME AND SALT FOR MANURING COCONUT PALMS

BY

M. L. M. SALGADO, Ph.D. (Cantab.), B.Sc. (Lond.), Dip. Agric. (Cantab.)
SOIL CHEMIST, COCONUT RESEARCH SCHEME, CEYLON

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(1) Many inquiries are received by the Soil Chemist's Division of the Coconut Research Scheme regarding the possible beneficial effects of lime and salt (in the form of denetured salt or salt sediment) in coconut manuring. The notes in this leaflet are intended to meet such inquries and to set out the lines on which the Division's recommendations are made.

(2) Though we have no data from controlled experiments, the following information based on the known chemical and physical effects of these constituents on the soil should meet present requirements.

(*a*) *Lime.*—Proposals to use lime are based on the following claims :—

(i.) *Possible effect of " correcting acidity. "*—Coconuts however, tolerate a wide range of soil reaction, extending from extreme alkalinity on coral atolls to extreme acidity on peaty soils without any ill-effect so long as adequate supplies of potash and other manures are available and the soils are drained.

The actual calcium (not *lime*) needs of the palm are relatively small and should be adequately provided by the calcium in such manures as bonemeal, saphos phosphate (calcium phosphate) and calcium cyanamide. If the debris of a coconut estate such as butt-ends and fronds (" branches ") are returned to the soil either by burning during ploughing or manuring or by mulching, calcium taken up from the soil is actually returned in an available form, so that the calcium status of the soil is thereby maintained.

(ii.) *Releasing Available Potash.*—In this connection our observation is that lime broadcast, and ploughed, perhaps due to release of potash, the dominant requirement for coconuts, effects an immediate increase in crop, but this in three or four years is followed by chlorotic appearance, yellowing of the crown, and leaves subject to grey blight (Pestalozzia *palmarum*)—typical signs of potash deficiency and an inevitable decline in yield, probably due to exhaustion of potash reserves in the soil.

Lime without manure makes father rich and son poor, is a popular saying in British farming lore, which may hold good in the case of coconuts too. This is particularly true of light sandy and gravelly soils, though not on heavy clay soils with reserves of potash.

Leaflet No. 13, Coconut Research Scheme, Ceylon.
(This leaflet is supplementary to Leaflet No. 12 :—" Notes on the Manuring of Coconut Palms.")

(iii.) *Improving Texture of Heavy Clay Soils.*—Liming is certainly a well known practice in farm lands to improve the texture of heavy clays in temperate climates. But the minimum rates applied are at least 2 to 3 tons per acre. On coconut estates, the use of such doses are out of the question, costing today Rs. 200 per acre or more, whereas improvement of texture and that of a permanent nature can be more economically realised by cultivation operations such as draining and husk burying. (See Leaflet No. 5, Section 7.)

It is therefore recommended that money spent on liming can be better utilised on other essential manures, particularly on potash.

(*b*) *Lime for Improving Pasture.*—The only case where liming in moderate quantities of 2 to 3 cwts. per acre, broadcast and ploughed and then harrowed (or better ploughed, then limed and harrowed to allow the shallow-rooted grasses to absorb the maximum) can be justified, is when it is used to improve the lime content of pasture where imported breeds of cattle are kept on the land. This can, of course, be better achieved with basic-slag or saphos phosphate which improve both the lime and phosphoric acid contents of pasture.

Addition of lime alone is, therefore, injudicious for this purpose as both lime and phosphoric acid are required for the balanced mineral nutrition, particularly bone formation of such animals, in contrast to the needs of indigenous cattle whose mineral requirements are comparatively small and should be met by the normal content in unlimed and unslagged pastures. In this case biennial applications of 2 to 3 cwts. per acre (or even up to 5 cwts.) can be considered better than infrequent heavy applications, in order to reduce the losses by leaching under conditions of heavy rainfall.

(3) *Salt.*—The alleged reasons for the use of salt are briefly mentioned here, but are based on exaggerated and unscientific deductions. The reasons usually stated in support of the use of salt are :—

(i.) *The palm thrives on the littoral owing to the presence of salt in sea water.* On the other hand palms thrive unmanured in the hinterland as in the Kurunegala district away from the sea, without the addition of salt. It is quite probable that it is the potash in the sea water and not the sodium chloride that benefits coconuts in this case.

(ii.) *The use of salt is alleged to improve the water-holding power of the soil* by the hygroscopic nature of salt and aid the palms in withstanding droughts. As common salt is a material which absorbs moisture, it has been assumed that when added to the soil it remains unchanged and favours the retention of water. When applied, salt enters into chemical reaction with the clay portion of the soil and one cannot imagine how a few pounds per palm of salt can improve the water-holding properties to a material extent.

(iii.) *That Sodium Chloride in salt can replace potash as a plant nutrient.* —For certain potash-loving crops, such as turnips it has been claimed that the use of salt economises the uptake of potash, but we have no such evidence for coconuts.

(iv.) Application of salt may liberate potash by base exchange, but here too continued use of salt can ruin the texture of the soil.

(v.) Salt from the local salterns has been claimed to be beneficial, as it contains small amounts of potash, but our analyses have shown that only traces and that in very variable amounts are present. (See Leaflet No. 9, Section 2 (*g*)).

Until experimental evidence is available we cannot recommend the use of salt as manure for coconuts and *as with lime, money can be better spent on other essential manures whose beneficial effects have been proved beyond doubt.*