

# REVIEW

## POTASH: ITS PRODUCTION AND PLACE IN CROP NUTRITION

By G. A. Cowie (Edward Arnold & Co., London)

(Price: 21s.)

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A READABLE book on potash and its place in crop production has long been overdue. There are several monographs on the manufacturing and technological aspects of the potash fertiliser industry (such as Potash by J. W. Turrentine, John Wiley & Sons Inc.), but a concise well written book on the agronomic applications of potash as a manure had yet to be written. This need has been filled by Dr. G. A. Cowie (of Potash, Ltd., London) in publishing "Potash : Its production and place in crop nutrition."

In the N.P.K. trinity the three major elements needed for crop production, potash had been the Cinderella. For tropical agriculture in general, nitrogen held first place as in Cereals and tea, then phosphates and finally potash. In fact recently the agricultural expert to a Technical Mission that arrived in Ceylon who visited our Institute was surprised when told that potash was the dominant manurial requirement of coconuts.

The book under review consists of compact 170 pages, arranged in nine chapters and two useful appendices.

The first five chapters are devoted to the manufacturing and production side and a very useful statistical summary of the statistical position and the economics of the potash fertiliser industry. In a world of diminishing natural resources, where man in his greed is raping mother earth, without any regard for posterity and the inevitable increase of population, it is a consoling thought to be assured that, although for nearly a century the greater part of the world's requirements of fertiliser potassium have been supplied from subterranean deposits of water-soluble minerals (in particular the German Stassfurt deposits), the potassium reserves estimated, particularly in Germany and Russia, expressed in terms of pure potash ( $K_2O$ ) amount to between 6,000 to 9,000 million tons).

World production has increased from 68,600 tons ( $K_2O$ ) in 1880 to 2,800,000 tons in 1938 and in 1950 production is estimated to reach 4,000,000 tons. On this basis we are assured of reserves to last at least 2,000 years, not taking into consideration the reserves exploitable from sea water, from the bittern left over after the manufacture of common salt.

Germany yet remains the main source of world supplies, but the large part of the exportable potash from Germany, however, must come from the Russian zone, which before the war accounted

for nearly 60 per cent. of the total production of German potash. France is the next large scale producer, and it may be mentioned that our supplies in recent times comes mostly from France.

The supplies from the Dead Sea deposits of Palestine which were of the greatest value to Ceylon during the war time have temporarily gone out of action due to political disturbances ; while recently small quantities of *Eritrean* potash (probably made from sea water) has been imported by some manure firms in Ceylon.

In the consumption of potash Holland is the largest consumer per unit area, with 90 lbs.  $K_2O$  per acre of arable land, U.K. 31 lbs., U.S.A. 5 lbs., and U.S.S.R. 1.7 lbs. It would be of interest to estimate the consumption per acre in Ceylon's agriculture.

The use of potassium as a fertiliser is of necessity influenced by such factors as the natural potassium status of the soils, the scale and intensity of potassium demanding crops and according to whether or not agriculture is largely based on livestock.

Coconut planters may recollect the days when such low grade potash manures such as Sylvinit and Kainit were popular ; these have been replaced by the high grade potassic fertilisers such as Muriate of potash 60% grade containing 95% chloride of potassium, 55% grade with 87% ; 50% grade with 79.1% ; Potash manure 40% with 63.3% potassium chloride ; and sulphate of potash 48% ( $K_2O$ ). Of these only 40% potash manure contains appreciable amounts of magnesium (5.5% as sulphate and 1.3% as chloride). Except the 60% grade which contains 3%  $NaCl$  (common salt), the other contain considerable amounts, as much as 14% in the 50% grade and up to 21% in the 40% potash manure.

It would be of interest to note that "Kainit" which originally contained high amounts of magnesium, has been found to be almost absent or in traces in recent imports to Ceylon. "Kainit" is now considered merely a trade name, whereas before it was considered a Potassium-Magnesium mineral.

Chapter VI : Relation of potassium to soil and crop should be read by all who wish to have a clear understanding of the principles of potash manuring, relating to such topics as uptake of potassium by the plant, absorption by root contact, potash fixation, potash reserves in the soil, influence of climate on potassium needs, and interaction between potassium and other major nutrients and the subject of balance of fertilisers, the relation of potassium to quality and health of crops, loss of potassium from the soil, fertiliser placement, symptoms of potash deficiency of typical crops. This indeed is the most comprehensive chapter, not too long, readable and with a condensed bibliography.

The next Chapter on "Methods of diagnosis of mineral deficiencies" is both scientific and popular account which intelligent coconut planters will do well to read.

Chapter VIII deals with fertiliser requirements of British Crops.

It is Chapter IX : "British Commonwealth Crops—Tropical Sub-Tropical, etc.," that is of particular interest to us ; the section on Coconut palms, pages 121-124 is an excellent summary of the work of the Soil Chemist's Division of the Coconut Research Scheme (now Institute) up to 1948. It should, however, be brought up-to-date by incorporating the more recent data included in the Annual Report for 1949 (Sessional Paper. XII, 1949). Recommendations regarding coconut manuring under Ceylon conditions are well summarised from the publications of the

Reviewer and should be read by all progressive Coconut Planters. To those who perennially ask : "What has the Coconut Research Scheme done?" This section of the Book by an international authority should be the best answer.

In view of the dominant role played by potash in coconut manuring in Ceylon, this book can be recommended without any hesitation to all interested in appreciating the agronomy, manufacture and chemistry of this important plant nutrient.

Unfortunately this broadbased excellent book and its balanced judgments on science and practice are marred by some unfortunate remarks which non-European Scientists in the Commonwealth may resent. In the first paragraph of this Chapter the amazing statement is made that "Yields per acre are high in some European countries but the application of scientific methods to Agriculture in the tropics has so far been *limited to a few areas well supplied with European men of Science*" (Italics ours). Perhaps the author had not been aware of the excellent work done in India by "Non-European" men of Science, and Dr. Cowie may be interested to know that the work on the manuring of coconuts in Ceylon extensively quoted by him in his excellent book has been carried out by men of science of the Commonwealth who do not claim to be "European men of Science." Perhaps the author meant men of science with scientific training in European Universities and Research Institutes. It is hoped that this error of judgment will be rectified by the author in the next edition, in which the reviewers recent work on the subject of coconut manuring published since 1948 will also be included.

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