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Recent Advances in Agriculture—Plant Introduction and its Further Possibilities

by

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Introduction: In the crop improvement programmes, the introduction of species and varieties forms an integral part. The introduction of plants of economic value from another place where these have already been tried and exploited, is a direct and easy method in agricultural development. In fact, most of the cultivated plants of the various countries are such introductions made sometime or other. DeCandolle (1904) and Vavilov (1931) have dealt extensively on the origin of the cultivated plants. Rajasekhara Mudaliar (1953) has given a complete review of the plant introduction work in the different countries in the recent times in general and has stressed on the aspects of grasses and legumes in particular. Wenholz (1929) mentions that all the chief cultivated farm, fruit and vegetable crops grown in Australia had originally to be introduced from some other part of the world. McCann (1950) says that every major crop grown in the United States of America is an immigrant. In an eminently agricultural country like ours, the importance of plant exploration and introduction needs no emphasis. The former concerns with the search for wild species of economic value for bringing them under cultivation while the latter deals mainly with the introduction of plants of desirable qualities, from foreign countries with the object of improving our cultivated crops.

Significance of Plant Introduction: Some economically useful plants such as food-crops or plants useful as a source of raw material for industries can be *directly utilized* by introducing and cultivating in suitable areas in our country. Rajasekhara Mudaliar (loc. cit.) gives a detailed account of many such introductions made in our country, as Cinchona, Para rubber, Cashewnut, etc., and brings out the possibility of many more introductions. Such additions of new plants of commercial importance and their cultivation on a large scale will bring in industrial development also.

Introduced species and varieties of plants may be useful *indirectly* in increasing the range of material on hand for breeding purposes; it is well known that the chances of producing desired types are dependent upon the initial breeding material. Pal and

Ramanujam (1946) have stressed the importance of the introduction of exotic species and varieties, their systematic study and classification with regard to their inherent useful characters, as an important preliminary step in any crop breeding programme. Some of the exotic species and varieties may be highly useful in contributing "the genes" for resistance to diseases and pests and it is very evident that the plant breeder is able to produce varieties to suit multitudes of purpose, when only he has comprehensive collections which represent the most complete assortment of the characters found in the plants concerned.

Building up of a collection of varieties, forms, types, eco-types and races of a particular species of crop is a great necessity for a breeder as only from such a varying plant material he will be in a position to select the suitable improved type for the purpose intended. In most of the cultivated crops which have been very early introductions and which have stayed on as agricultural crops, a good number of strains have been evolved by the application of the principles of pure-line selection to naturally varying populations or to segregating progenies of inter-varietal crosses. Plant introduction will help to build up such a collection of varying types. With the greater scientific data available on the growth and developmental aspects of plant life, there will be greater scope for getting types with certain advantageous characters, by plant introduction.

The introduction of a particular type from another region with different temperature and length of day may result in the luxuriant growth of the vegetative parts and the suppression of the reproductive phase. In plants in which the vegetative growth and output are the primary considerations as in fodder grasses, fodder legumes, green manure plants, leafy vegetables, leaf and stem fibres, soil conservation plants, etc., there is scope for improvement by Plant Introduction. A couple of instances may serve as a pointer. In South India, we have the indigenous species of *Panicum antidotale* and *Brachiaria mutica* occurring wild. But these grasses as they occur in the wild conditions are not productive types to be of economic value. But the plants of *Panicum antidotale* raised from the seeds received from Australia are different in growth behaviour and have proved to be a good drought resistant grass not only for South Indian conditions but also for the other States. Similarly the type of *Brachiaria mutica* introduced from Ceylon has so much of vegetative growth, that the seed production is negligible, enhancing the nutritive value of the grass.

As shown above it is quite probable that a particular species or type, of a region though may not be having economic characterstics in that region, may have potentialities of advantageous utilisation in another country. As such the introduction of plants, their testing in gardens paying close attention and acclimatization of the promising ones will definitely add to the national wealth. And in fact, it is with this object in view the Commonwealth Agricultural Bureau, England has drawn attention to the recommendation of the Review Conference 1950 that all the research centres maintaining living collections of economic plant material should be invited "to give at least 12 months' notice of their intention to discard any of their material likely to be useful to member countries".

Work of Plant Introduction in Madras: The Botany Section of the Agricultural Research Institute, Coimbatore has been serving as the Plant Introduction Centre for the State, in a very modest way. The introductions have been mostly on grasses and legumes. The section collaborates with the Plant Introduction Wing of the Indian Council of Agricultural Research at New Delhi. There is a great possibility of intensifying this item of work covering a larger number of other economic crops than those now dealt with. Rajasekhara Mudaliar (loc. cite) in his comprehensive treatment on this subject has stressed the importance of (1) the formation of an efficient Plant Introduction Bureau & (2) the Systematic Survey of the plant wealth of the country.

From a study of the Crop improvement steps taken in countries like United States of America, Australia, and European countries, phenomenal success had been achieved by Plant Introduction in the matter of food self-sufficiency, industrial raw plant material, fodders and soil conservation plants. With the much advantageous climatic conditions as available to us on the plains and on the different altitudes of the hills of Nilgiris, Madura and Yercaud and the slopes of the Western Ghats, the Plant Introduction work has great possibilites.

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