

Plant Introduction and Improvement of Grasses and Legumes (Contd.)

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PART — II

The Organisation of Plant Introduction Bureau in Australia: The Division of Plant Industry of the Council of Scientific and Industrial (Plant Introduction Section) Australia, is responsible for the search of a wide range of herbage species for use in the Commonwealth, with particular emphasis on leguminous herbage species. On Plant Introduction in Australia, Metaggart (1940) says that the first white settlers in Australia had to bring food stuffs into the country for living; vegetables, fruit crops, grasses and legumes, used in pastures are all introductions; along with these useful plants, unfortunately several hundreds of noxious weeds were also introduced. He refers to seven clearly defined principles for introduction of plants:—

- (1) A climatic, soil and vegetational surveys to determine the ecological environment.
- (2) The search for desirable plants, by exploration in similar climates of the World.
- (3) Imported materials to pass through quarantine.
- (4) Preliminary testing in conveniently placed testing centres to determine their potential value under Australian conditions.
- (5) Seed multiplication for wider and more detailed trial.
- (6) Detailed trial of selected species under normal Agricultural practice and comparison with standards.
- (7) The successful species to be given over to State Departments and other agencies for widespread tests.

The stock of Introductions in Australia in 1940 totalled 6686, including 1406 grasses, 1250 legumes, 72 miscellaneous herbage plants, 2800 wheat etc. All introductions are first placed under quarantine to test diseases and pests. Preliminary testing is undertaken at 3 centres, namely, Canberra, for Mediterranean type of climates, Lawes for sub-tropical introductions, and 'Fitzroyvale' for more Tropical types.

As in most cases very small supplies of seed are received, it is only possible to make first studies on individual plants or in plants in rows. Sometimes plants will not set seed if there is difference in light or

dark periods, or in heat or rainfall. Frequently the seed sample is not a pure line and considerable variation between plants occur. It is necessary to observe all such facts and to study the type of growth of plants in a preliminary rather than diagnostic way; they are also checked taxonomically. Selected grasses and legumes are subjected to plot study and to grazing and mowing in order to determine longevity, palatability, and productivity.

New Zealand: Allan (1931) records that the introduced plants in New Zealand steadily increased from 1855, when Hooker recorded only 60 species, in 1870 the number rose to 292. In 1906 Cheesman has recorded 576 species. In 1931 the number stood at 930, half as many as indigenous species. The author emphasizes the need for a thorough study of the systematics of the alien flora, so that really pernicious plants may be destroyed even in the beginning, before they become regular pests. The author gives instances of half-a-dozen plants which have become pests and concludes that the alien flora has to be more intensively examined at the time of introduction.

The United Kingdom: In his letter dated 4—12—1952 P. S. Hudson, the Director of the Commonwealth Bureau of Plant Breeding and Genetics, School of Agriculture, Cambridge, says that there is no Bureau of Plant Introduction in the United Kingdom as such. He says that the 1946 Conference of the Commonwealth Agricultural Bureau set up a Committee to deal with plant expeditions but was unable to provide sufficient funds for the Committee to undertake active work in the field of plant introduction and the maintenance of plant collection, then again the 1950 review conference of the Commonwealth Agricultural Bureau decided that in view of the fact the Food and Agricultural Organisation (F. A. O.) of the United Nations had taken up the question of World Catalogue of Genetic Stocks it would be unnecessary for the British Commonwealth to engage in similar activity; the Bureau has co-operated with the F. A. O. upto the present in the work of the World Catalogue. Thus it will be seen that an organisation like the one in U. S. A. or Australia is not existing in the United Kingdom.

Regarding the introduction of plants in British Colonies, the Colonial Office issued a digest of the legislation for introduction of plants which the Colonies adopted. The Colonies of west Africa have entered into a Plant Exchange Convention; a similar Convention now links the Union of South Africa, Southern Rhodesia and the Belgian Congo; in respect of East African, Colonies also arrangements of a similar nature have been approved.

Philippines: Manas, Y, Cruz, et al (1939) considers that due to the work of Plant Introduction by the Bureau of Plant Industry, a large number of plants are being grown in island. As examples, Citrus, avocado,

Strawberry onions, Cabbages, Cauliflower, tobacco, Para rubber etc., are mentioned. Napier grass of Tropical Africa was introduced from Hawaii in 1916, *Paspalum dilatatum* from Australia in 1907. Teosinte from America in 1908, Guinea grass, a native of Tropical Africa from Hawaii in 1907, Sundan grass from America in 1925. The author finally concludes that plant introduction has brought in several valuable economic plants for the island.

Rhodesia: Mundy (1932) records that with a few exceptions, the standard strains of seed grown in Rhodesia are the results of introduction. The methods followed have been to grow each introduction for at least two years on small plots of 1/50 of an acre or less in area; when the results are satisfactory, cultivation has been extended to larger plots for a further period of 5 years.

India: The importance of Plant Introductions to our country has been stressed by Scientists from time to time. Dr. Pal (1946) after discussing at length the crops that have been introduced in America, Russia and other places, says that the work of Plant exploration and introduction is vested in well equipped Bureaux in countries like U. S. A. and Russia, and that a similar bureau in India is long overdue. Parthasarathy (1953) says that advanced countries like the U. S. A., Russia, and Australia have well organised Plant Introduction Bureau and that the establishment of a similar Bureau in India is long overdue. He further states that this matter has been brought to the notice of the authorities concerned, but due to financial considerations, it is being postponed. He concludes by saying that with the present day International Co-operation in respect of inter-change of plant materials the advantage of establishing a Bureau needs no emphasis, that the full assessment of the utility of the genetic stocks in the different regions of India will be facilitated by the functioning of such a Bureau.

Plant Introduction in India, to start with, was slow and haphazard and was carried on by different Institutions and individuals.

- (i) Royal Botanical Gardens, Sibpur.
- (ii) Botanical Garden, Ootacamund.
- (iii) The Botanical Survey of India.
- (iv) Agri-Horticultural Garden, Madras.
- (v) Lloyd Botanical Garden, Darjeeling.
- (vi) Agricultural Departments of different States.

In 1935, the Crops and Soils Wing of the Board of Agriculture and Animal Husbandry in India stressed the need for an Organisation on the lines of U. S. A. or U. S. S. R. In 1941, the subject was again brought up and need for the Organisation was reiterated. In 1944 at the instance of

the Indian Council of Agricultural Research, the Division of Botany, Indian Agricultural Research Institute submitted a scheme for the establishment of a nucleus organisation for the introduction of new economic plants, pending establishment of a full fledged bureau. The Scheme was sanctioned for a period of 5 years from April 1946 as a wing of the Botany Section of the Indian Agricultural Research Institute. Import of useful plants has been carried on; the work of plant exploration is carried on a limited scale. More than 3000 plants have since been introduced by this nucleus organisation.

A list plants introduced in Delhi is given by Pal (et al)-1949. The following are among the important plants recorded by the authors:

Wheat: In *Triticum vulgare* and *Triticum spelta* about 200 improved selections were obtained from Australia, Sweden, Kenya, Japan, U. S. A., Palestine, Canada, Formosa, Argentina, Kabul, and Brazil for such useful characters as rust-resistance, high yield etc.,

Barley: (*Hordeum vulgare*): About 60 selection of Barley were received from U. S. A., Canada, Australia and other places.

Rice: A variety from Russia said to be suitable for growing on steep lands was received.

Pulses: From China, Philippines, U. S. A., Australia etc., Soya bean, lathyrus, Pisum and green gram were obtained.

Oil seeds: Among the oil yielding plants 72 collections which include also Flax, Safflower, Castor etc., were obtained.

Fibre Plants: Cotton from U. S. A., *Abutilon aricenuae* (China Jute) from China etc., were introduced.

Tobacco: Selections from Philippines and U.S.A. were introduced.

Forage grasses: Giant star grass a native of Africa was introduced through the Royal Botanical Garden, Kew, Richmond.

Melinis minutiflora: (Molassus grass, was obtained from Venezuela. This grass has been introduced by some planters in Anamallais and is spreading rapidly. Mosquitto repellent character claimed for this grass in its native country could not be seen in this country. But this promises to be a good fodder grass for the hills.

Napier Grass: (*Pennisetum purpureum*) was introduced from the Royal Botanical Garden, Kew.

Kikyu: (*Pennisetum clandestinum*) was introduced from Kenya.