

Darjeeling Tea Research and Development Centre, Kurseong

Darjeeling Tea Research & Development Centre (DTR&DC) was established at Kurseong in 1977 to provide Research & Development support to Darjeeling tea industry on demand of the State Government and Tea Associations. The Laboratory Building was formally inaugurated in 1981 by Shri Pranab Mukherjee, the then Hon'ble Minister of Commerce, Steel & Mines. It has been functioning as a research institute with 21 ha of farm land for research.

The centre is headed by a **Project Director** and consists of 4 divisions namely, **Farm Management, Soil Science, Plant Protection and Bio-chemistry**. Each division has one Senior and one Junior Scientific Officer followed by laboratory assistants. At present there are 50 labourers (including seasonal) who are associated to different farm operations related to research. Besides, research fellows are working in different in-house, collaborative and externally funded projects. However, there are no regular scientist posts except, one soil scientist. Engagement of four contractual Scientists has been initiated recently for four divisions to undertake advance areas of tea research.

The MOC&I, Govt. of India, with its kind initiative had sanctioned Rs. 5.68 crore during 11 Five Year Plan for the up gradation of the centre to become a "*Centre of Excellence*". To this effect, developments of new infrastructural facilities are already in process. In addition to DTR&DC at Kurseong, Tea Board has recently established one Quality Control Laboratory (QCL) at Tea Park, near New Jalpaiguri Station, Siliguri. The earlier research laboratory of DTR&DC at Matigara, Siliguri was shifted to the QCL, Tea Park.

Over the years, DTR&DC has made some good contribution in tea research both in terms of research findings published in journals/conference proceedings and recommendations to the industry related to better management of soil and weeds, pests and diseases, modifications of important process parameter for retention of quality of Darjeeling tea and

so on. DTR&DC organizes seminars/workshops on regular basis for the industry in general and for small tea growers of Darjeeling in particular.

Research & Development Programme:

The R&D programmes are focused on Agro-techniques, Soil Fertility & Nutrient Management, Plant Protection, and Biochemical aspects of Darjeeling tea so as to sustain the productivity as well as quality of tea. The following R&D Projects are in progress:-

In-house Projects:

- (i) Determination of suitable pruning cycle of old Chinary tea bushes.
- (ii) Seasonal and clonal variations in shoot extension rates and shoot numbers in tea clones.
- (iii) Effect of environmental factors on the physiological and biochemical attributes of tea clones.
- (iv) Effect of aqueous plant extracts in supplementing plant nutrients and optimization of yield and quality of tea.
- (v) Performance of Darjeeling tea clones in the nursery through vegetative propagation.
- (vi) Studies on the effect of integrated plant nutrient supply on soil health and yield of Darjeeling tea.
- (vii) Extraction, isolation and characterization of volatile flavoury compounds in Darjeeling tea.
- (viii) Preparation of biochemical data base of elite clones available in germplasm bank at DTRDC.
- (ix) Evaluation of plant extracts for the control of Blister Blight disease.
- (x) Efficacy of bio-fungal formulation for the control of sucking insects like Thrips, Jassid and Tea Mosquito Bug.

In-house Collaborative Projects:

- (i) Development of Package of Practices (PoP) for organic cultivation of tea in Darjeeling Hills. (CFC/IFOAM and Tea Board of India).
- (ii) Development of Vermi-compost Model for imparting Training-cum- Demonstration at DTRDC site. (Collaboration with IIT, Kharagpur).
- (iii) Nitrogen mineralization of organic matter in acid soils of tea. (Collaboration with UBKV, Cooch Behar).
- (iv) Development of Phosphate Solubilizing Biofertilizer (PSB) for tea in acid soils of North Bengal. (Collaboration with UBKV, Cooch Behar).
- (v) Status, vulnerability and mitigation of soil erosion in tea growing areas of Darjeeling. (Collaboration with TRA, Jorhat).

- (vi) Classical and molecular approaches for improvement in Darjeeling tea. (Collaboration with TERI, New Delhi).
- (vii) Elicitation of pharmacologically active poly-phenols in tea. (Collaboration with Calcutta University).
- (viii) Evaluation of the therapeutic efficacy of Darjeeling tea and its bio-active compound with special reference to L-theanine in Parkinson's Disease. (Collaboration with Calcutta University).
- (ix) Survey on the incidence of insect-pests and predators including spiders in Darjeeling tea plantations (Collaboration with Calcutta University).
- (ix) Biochemical and physiological characterization of Darjeeling tea cultivars towards the selection of superior genotypes against biotic stress. (Collaboration with ISI, Kolkata).
- (x) Attempt to develop gene-based markers for aroma traits in tea plant. (Collaboration with IIT, Kharagpur).

Externally Funded Project:

- (i) Validation of tea descriptors for developing DUS (Distinctiveness, Uniformity and Stability) guidelines and registration of tea varieties. (Funded by PPV&FRA, New Delhi).

Services:

- (i) Soil, plant, manures and fertilizer samples sent by the Tea Estates are tested for their nutrient status and suitability, and recommendation are offered accordingly. The analysis of black tea samples to be exported is also carried out for biochemical parameters.
- (ii) On request advisory visits are being extended to tea gardens for specific problems.

Achievements:

- (i) Minimum tillage replanting methodology has been developed for inorganic cultivation of tea.
- (ii) Frequency of plucking cycle in respect of yield and quality of tea has been standardized.

- (iii) Soil fertility status map of Darjeeling tea growing soils has been published.
- (iv) Soil zinc status map of Darjeeling Tea Estates has been published.
- (v) X-ray diffraction studies of soils of quality and non-quality sections of Darjeeling tea gardens have been made. The genesis of the soils of this area has been outlined on the basis of detailed morphological, physico-chemical and mineralogical analysis.
- (vi) Bio-efficacy of different *Neem* products in controlling certain pest of tea has been tested.
- (vii) Darjeeling black tea has been analyzed as per ISO 3720/PFA specifications.
- (viii) A new concept of tea blending has been developed. The green leaves of tea clones were mixed during manufacture before fermentation stage (unlike traditional mixing of finished products). The process enhanced the flavor/quality of Darjeeling tea, thereby increasing the profitability of tea gardens substantially. Also, the blending compatibility of various clones released for Darjeeling tea industry has been established.
- (ix) β -D glucosidase, a flavor releasing enzyme has been extracted, isolated and characterized in Darjeeling tea. The pH and temperature dependent studies having implications on tea cultivation and tea manufacture has also been done.
- (x) A comparative study of biochemical composition of Darjeeling tea under the organic and inorganic cultivation has been completed.
