

Model Nursery, Baragaon, Shimla

The progress made in tree improvement would be of little significance without improvement in plant propagation methods. Most of the plant propagules like seed etc. often results in production of less desirable planting stock if they are not propagated under certain conditions which preserve the unique characteristics of the plant that make them desirable. The emphasis on plantation forestry for enhancement of forest productivity also brings a concern for production of quality planting stock from improved seed and propagation by employing modern nursery techniques. The gains of tree improvement can be fully realized by adopting suitable plant production methods. In the pre-planting activities, production of quality planting stock is the most important aspect, which has direct bearing on successful establishment of productive plantations. Improved seed is likely to be in short supply for quite some time and it is imperative to improve upon nursery techniques to utilize its full potential. The role of nursery technology will remain of prime importance irrespective of the propagation technologies employed. Therefore, establishment of "Model Nursery" and their subsequent management to continuously improve the nursery techniques of mandate species and to produce uniform quality planting stock would be regarded as main activity of all the Forestry Research Institutes.

Himalayan Forest Research Institute, Shimla has established a Forest Model Nursery near its Conifer Campus, Panthaghati at Baragaon, Shimla during 2001 under World Bank aided project.

Location of the Nursery: Forest Model Nursery is located about 15 km away from Shimla town at Baragaon on Dhalli-Shoghi bypass road at 1800 m elevation (77° 10' 15.7" E and 31° 04' 14.3" N).

Nursery Size: Area of the nursery is around 2.5 ha. The nursery is situated on the Northern Aspect with 10-15% slope. The texture of the soil is clay loam.

Facilities at Model Nursery:

1. Green House
2. Shade House
3. Mist Chamber
4. Guard Hut
5. Office
6. Potting Mixture Shed
7. Compost Unit
8. Permanent Mother Beds
9. Water Storage Pond

Studies /Works Undertaken in the Past:

- Studies on Root-trainer seedling production system in *Cedrus deodara*, *Alnus nitida* and *Grewia optiva* carried out.
- Vegetative propagation trials of potential cold deserts species viz. *Elaeagnus umbellata*, *Colutea nepalensis* and *Rosa webbiana* have been conducted successfully under semi-controlled condition.
- Vegetative propagation studies conducted in Deodar with very little success.
- Introductory trial of *Paulownia* spp carried out in the nursery. Around 5000 Seedlings of *Paulownia* spp raised in the nursery and planted in various sites in Himachal Pradesh.
- Large scale production of *Prunus armeniaca* (Wild Apricot) for training, demonstration and distribution under NOVOD project carried out successfully.
- Germplasm of medicinal plants maintained for training and demonstration purposes.
- Studies on preparation of compost from Pine needles and grasses carried out.
- 32 species of Insect belonging to Order Lepidoptera, Coleoptera, Hemiptera and Orthoptera from selected medicinal plants were collected and identified in the laboratory.
- Collected insect fauna from the logs of Chir-pine in the Insect Breeding Station have been identified as *Anphaxia* sp. (Coleoptera: Buprestidae), *Calochromus* sp. (Coleoptera: Lycidae), *Temnochilacoerulea* Ol. (Coleoptera: Trogoitidae), *Platypus biformis* Chap. (Coleoptera: Platypoetiidae), *Dystropicus femosus* Mshl. (Coleoptera: Curculionidae) and *Elanophilaignicola* sp. N. (Coleoptera: Buprestidae).
- Under Plan Project "Planting stock improvement programme in ***Cedrus deodara***" Project, seedlings of *Cedrus deodara* raised through seed collected from Candidate Plus Tress in Himachal Pradesh raised in the nursery.
- Under Plan Project "Standardization of methodology for seed collection, seed handling, storage and breaking seed dormancy in ***Juniperus polycarpus*** and ***Fraxinus xanthoxyloides***" project funded by ICFRE, seed dormancy breaking methodology in *Juniperus polycarpus* and *Fraxinu sxanthoxyloides* has been successfully developed.
- Under externally funded project "Ecological Assessment, Collection, Multiplication and Establishment of Clonal Banks of the Superior Genotypes of Economically Important hill Bamboos" funded by

National Bamboo Mission, seedlings of superior genotypes of economically important Hill bamboos collected from different areas viz., Kullu, Sirmour and Shimla district of Himachal Pradesh raised in the nursery for establishment of Clonal Banks.

- Under Plan Project "Determination of Morphological and Physiological Quality Parameters of Nursery Stock of ***Cedrus deodara*** and ***Quercus leucotrichophora***" experimental trials for determining morphological and physiological quality parameters of nursery stock of ***Cedrus deodara*** conducted in the nursery.
- Under Plan Project "Identification of superior chemotypes and ***ex-situ*** conservation of ***Podophyllum hexandrum*** Royle from Himachal Pradesh and Jammu & Kashmir (Ladakh)" seed germination trials of ***Podophyllum hexandrum*** conducted in the nursery.
- Under Plan Project "Development of techniques for raising Deodar (***Cedrus deodara***) plantations through tall plants" nursery stock of ***Cedrus deodara*** raised in the nursery using different containers.
- Under externally aided project "Raising of Nursery Stock of Tall Plant and Medicinal Plant" funded by Himachal Pradesh Forest Department" 18,600 quality plants of ***Prunus armeniaca*** (Wild apricot) and ***Prunu smira*** (Behmi), 15000 plants of ***Juniperus polycarpos*** has been raised in the nursery. The seedlings of ***Prunus armeniaca*** has been raised from the seeds collected from Ropa, Labrang and Kanam villages of Kinnaur district and the seedlings of ***Prunu smira*** has been raised from the seeds collected from Rakchham and Kanam village of Kinnaur district. Till date, around 15,450 quality plants of ***Prunus armeniaca*** has been supplied to Anni and Shimla Forest Division and 3140 plants of ***Prunus mira*** supplied to Sunni Range of Shimla Forest Division. 1000 plants of ***Juniperus polycarpos*** supplied to Moorang Range of Kinnaur Forest Division and 1550 plants of ***Juniperus polycarpos*** supplied to Lahaul Forest Division.

On Going Plan Projects/ Works:

- Under Plan project "Studies on Seed Germination and Longevity of ***Abies spectabilis*** (D. Don) Spach" experimental trial viz., effect of time of seed collection, effect of seed sizes and effect of quantum of shading on seed germination behavior of ***Abies spectabilis*** has been laid and germination data is being recorded.
- Under Plan project "Determination of nursery requirements and initial planting performance of ***Diploknema butyracea*** (Roxb.) H. J. Lam and ***Myrica esculenta*** Buch. Ham. under mid-hill

conditions of Himachal Himalayas” seed germination and vegetative propagation trial is being carried out in the nursery.

- Under Plan project “Biology and management of insect –pests of seeds of *Juniperus polycarpus* C. Koch and evaluating the insect-pests resistance performance in the nursery” experimental trial i.e., impact of various treatments on stored seeds of *Juniperus polycarpus* for controlling the attack of insect pest in nursery is being laid out and data is recorded periodically.

Germplasm of Medicinal Plants at Model Research Nursery, Baragaon (Shimla)

	Name of Species	Common Name	Plant's Part Used	Methods of Domestication	Used For
1	<i>Ocimum sanctum</i>	Tulsi	Whole Plant	Seed	Stomachic, bronchitis, ringworm, earache, urinary disorder.
2	<i>Valeriana jatamansi</i>	Mushakbala	Root, Rhizome	Seed, Root	Perfumes and cardiac preparations, hysteria, epilepsy, cholera, tonic and anti-septic.
3	<i>Withania somnifera</i>	Ashwagandha	Roots	Seeds	Rheumatism, cough, general debility, dropsy, powerful tonic for health.
4	<i>Spilanthes acmella</i>	Akarkara	Leaves, Flower & Roots	Seeds	Toothache, sore throat, gum pains and fevers.
5	<i>Digitalis lanata</i>	Foxglove, Hritpatri	Leaves	Seeds	Cardiac disorders
6	<i>Heracleum candicans</i>	Patrala	Roots	Seeds, Roots	Psoriasis, leucorrhoea and sun tan lotions
7	<i>Picrorhiza kurrooa</i>	Kutki	Roots	Seeds, offsets, stolons	Febrifuge, constipation, dropsy, blood purifier, jaundice.
8	<i>Saussurea costus</i>	Kuth	Root	Seed, Rhizome	Asthma, bronchitis, cough, diarrhoea, dysentery, fever, headache.
9	<i>Podophyllum hexandrum</i>	Bankakri	Root	Seed, Rhizome	Stomachache, Headache, Cancer
10	<i>Inula racemosa</i>	Manu	Roots	Seeds	Antiseptic, Urinary problems, expectorant, aphrodisiac



Water Storage Tank



Shade-house / Mist Chamber

Manpower:

Sh. Ramesh Chand Kainthla, Forester
Sh. Ramesh Chand, Multi Tasking Staff