



Wheat Summer Nursery

e-newsletter



Regional Station, ICAR-Indian Institute of Wheat & Barley Research,
Dalang Maidan, Lahaul-Spiti, Himachal Pradesh - 175140

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Utilizing off season nursery for marker assisted selection in wheat

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The summer nursery at Dalang Maidan, Lahaul-Spiti, is an important facility for growing wheat during off season (May-October). By using this national facility, there is scope of reducing time which is required for developing new wheat variety. The National Agri-Food Biotechnology Institute (NABI), Mohali (Punjab), an autonomous institute of the Department of Biotechnology, Ministry of Science and Technology, Government of India has been utilizing this facility for crossing and generation advancement in wheat marker assisted selection programmes. This facility has helped the institute in many ways:

Marker assisted selection: At NABI, marker assisted selection is being carried out for improvement of processing and nutritional quality in wheat using backcross breeding method to transfer useful traits from wild species, landraces and old cultivars for which foreground and background screening is important. Wheat derivatives could be sown at Dalang Maidan and get samples for DNA extraction. Selected homozygous lines could be sown in the main season crop at NABI.

Crossing and backcrossing: It is a unique facility, where corrective crossing and backcrossing could be planned. At this location spring wheat lines can get very good number of crossed seeds with similar efforts as the main season crop.

Late sowing assists in matching the flowering time in the main season and could be getting sufficient seeds after crossing and backcrossing at Dalang Maidan.

Generation advancement: Many of the scientists are using this facility for generation advancement. After sending the seeds to ICAR-IIWBR Karnal we get one advanced generation seeds before the sowing time in main season. Staff and scientists of off season nursery are very co-operative. Thanks to the efforts for the concerned personals, for creating nice, reliable and dependable facility.

Way to Dalang Maidan is very beautiful by road. Regional station is located in valley with snow-covered mountains in the backdrop making perfect picturesque location. I could do my experiments from early morning till evening while enjoying weather. Location of army dispensary and cafe at the same place (258 Transit Camp of Indian Army) is added advantage.



Accelerating Barley Improvement by Utilization of ICAR-IIWBR Off-Season Nursery

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Barley breeders of ICAR-Indian Institute of Wheat & Barley Research, Karnal (ICAR-IIWBR) are continuously utilizing the off-season nursery at Dalang Maidan for generation advancement, corrective crossing, disease screening and seed multiplication, to reduce time and keeping the faster pace for the development of a technology. Especially, different generations, families and advance bulks are being screened for stripe rust resistance, as the climatic conditions at the Lahaul-Spiti

are very congenial for yellow rust development. The centre also plays an important and crucial role in the conduction of Very High Altitude (VHA) summer



coordinated trial for wheat and barley entries to cater the need of cold desert of Leh & Ladakh in Jammu & Kashmir and Lahaul and many valley of Himachal Pradesh and Uttarakhand.

Every year nearly 200-250 crosses are being sent for generation advancement from F₁ to F₂ and newly developed advance breeding bulks are being evaluated for disease screening. In addition, the nursery has been used for seed multiplication of important genotypes and corrective crossing in malt barley improvement programme. The recently released malt barley varieties (DWRB91, DWRB92, DWRB101 etc.) have been developed with utilization of the summer nursery facility. The newly registered barley genetic stock DWRB127 (for stripe rust) was also evaluated at Dalang Maidan for yellow rust reactions under field conditions. Besides, barley germplasm collections have been also stored under natural conditions at Dalang Maidan.

**Wheat Improvement at CSK Himachal Pradesh Agricultural University, Palampur –
Contribution of Wheat Summer Nursery, Dalang Maidan**

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Wheat summer Nursery located at Dalang Maidan, Lahaul & Spiti has been of great importance to the wheat breeders at CSK Himachal Pradesh Agricultural University, Palampur. Wheat improvement at this institution came under the aegis of All India Coordinated Wheat & Barley Improvement Programme in the year 1975. Taking into consideration the importance of wheat crop in Himachal Pradesh a well organized multidisciplinary group of wheat researchers has been working to develop high yielding disease resistant and widely adapted varieties for different agro climatic situations of the state. Earlier, the breeders from the institute have been taking advantage of the offseason nursery at Regional Research Station, CSK HPAU, at Kukumseri near Udaipur Lahaul Spiti, which is 45km away from the Wheat summer Nursery located at Dalang Maidan. They utilized the centre facilities primarily for rapid development of pure breeding lines by advancing segregating generations. After shifting of AICW&BIP to the presently location at Rice & Wheat Research Centre, Malan, since 2002 and before that also, the Wheat Summer Nursery at Regional Station, Indian Institute of Wheat & Barley Research, Dalang Maidan, has been invariably used for generation advance and disease screening specifically yellow rust and powdery mildew for which it is a natural hot spot. This facility has allowed the centre to use the latest sources of disease resistance identified during the main *rabi* season immediately in the following summer season. Scarcity of land at the main breeding centre at Rice & Wheat Research Centre, Malan especially for the multiplication of large numbers of advance bulks/fixed lines sometime limits the multiplication/maintenance of large number of elite lines. After entry of the elite lines into the advance stage of coordinated testing or even after release of the variety, wheat summer nursery gives chance of multiplication of such material to fulfill the demand of pure seed for testing in the farmer's fields in the mini-kit or on farm trials. This way during past years this nursery has been very helpful in meeting out the demand of seed of the pipe line/released varieties.

Apart from the routine breeding programme, WSN facility has proven to be useful for student research, where inheritance studies using F_2 and back cross generation have to be completed in two-three years for completion of thesis work in stipulated period. Since harvesting of the pertinent generations/breeding materials planned to be grown in WSN, is delayed in NHZ as compared to other zones, sending material within stipulated time becomes challenging at times. Even then due to cooperation of the WSN Scientist In charge and technical Staff, this centre has been able to utilize this unique facility.