

ASSESSMENT OF WHEAT RUST RESEARCH AT RDC BAJO

Professor Robert Park, Director of Cereal Rust Research at University of Sydney, Australia is an eminent wheat scientists recognized globally as a rust pathologist. He visited Bhutan from 14-21 April 2016 to monitor the rust situation in the standing wheat and barley crops and explore the opportunities for his upcoming ACIAR wheat project to assist Bhutan wheat program.

The Professor made a courtesy call to the management team at RNRDC Bajo and discussed with the officials on the possible collaborative activities between Bhutan and ACIAR, Australia. The Program Director on behalf of the center welcomed the visiting guest and remarked that it is a great honour to receive the distinguished wheat scientist which was a clear indication of the attention paid towards wheat improvement in Bhutan. The guest also mentioned that it is an honour to visit Bhutan again and would continue to provide strategic and other support when opportunities arise through new wheat ACIAR Project which is in pipeline.

During the on station field visit to research station, Mr. Sangay Tshewang, a wheat researcher and coordinator, briefed the visitor on the on-going research and developmental activities at RDC Bajo, other RDCs and sub centers. The main highlights of research activities at RDC Bajo were:



Figure 1: In research station

- Evaluation of facultative wheat lines
- Bio-fortified trial as the 6th Harvest Plus Yield Trial (enriched iron and zinc)
- Disease screening of SAARC trap nurseries
- Disease screening of ICARDA Trap nurseries
- Yellow rust screening of Bangladesh advanced lines.
- Seed multiplication of potential two varieties.
- Seed maintenance of recently released three cultivars.

It was scouted in the Bajo station that leaf and yellow rusts were highly prevalent as expected, both in trap nurseries and varietal evaluation lines. Though newer varieties have been made available in recent year which are supposed to be resistant, it is also important to continue evaluating the elite materials for rust resistance. Prof Park commended the progress of wheat in Bhutan as demonstrated by the release of new varieties in recent years and the on-going varietal trials. Bhutan's commitment to regional collaboration such as the current screening of advanced Bangladesh lines for Yellow Rust resistance clearly signified its important role and interest.

In Wangduedzongkhag, spring wheat, winter wheat, barley and *Berberis* sp. were surveyed for disease incidence. *Berberis* sp. which are found abundantly have been reported to be an alternate host for stem and yellow rusts worldwide; but its exact functionality for yellow rust in Bhutan is not clearly understood. In Boelangdra, some traces of yellow rust in local wheat and barley



Figure 2: At Boelangdra in Kazhi

were observed. While the yellow rust incidence in wheat is not astonishing, the incidence in barley merits further investigation. To confirm this, the samples were collected and sent for race analysis to collaborators.

The cultivation of wheat annually by the local communities confirms the importance of wheat for food or other uses. Thus, there is an opportunity to increase the productivity through introduction of new high yielding variety whose adaptability is already proven. Therefore, BumthangKaaDrukchu will be promoted in this community in the ensuing season.

The springwheat crop was monitored in and around Punakha as similar to Wangdue. In all the surveyed sites, yellow and leaf rusts were found to be prominent both in the improved and local cultivars. This further confirms the existence of these two rust species in mid wheat growing areas of Punakha. The yellow rust incidence in recently released varieties signals that either the new varieties are breaking down to existing race or new race of stripe rust is emerging. Breeders and pathologists need to keep abreast and prepare for emergence of new races. The samples were collected and sent to Shimla and Pakistan for confirmatory results.



Figure 3: At Sirigang, Punakha

Haa is one of the major wheat producing Dzongkhags and the wheat grown here are of facultative type. Farmers currently cultivate local variety as improved varieties are yet to intrude in this ecosystem. During the survey, the crop was still at active tillering stage. No yellow rust was spotted in any of the surveyed sites. In addition, there were no other pests or diseases incidences.



Figure 4: Barley field at Paro

In Paro, wheat and barley are the most important winter cereals as signified by cultivated areas and production. Both these crops are grown in rotation with potato, one of the main cash crops for the Dzongkhag. At Laga and Susuna, local wheat was found to be infected by yellow rust. Since the infection was at initial stage, there is every possibility that severity would rise as the growth and development of crop advances. Thus, follow up visits are required to assess the disease situation. As in other places, the samples were collected and sent for analysis. The local barley was also monitored for any disease incidence. Except for low incidence of powdery mildew, the crop was very healthy.

A visit to National Plant Protection Center (NPPC), Simtokhawas made to interact with the management and plant protection officials. Both parties discussed on a wide range of issues with main focus on possible joint collaborative activities through the upcoming ACIAR wheat project. The enhancement of human resource capacity at NPPC was also highlighted which Prof Robert would look into.

The following are some of the outcomes from the visit of Prof Park.

- Professor Robert Park will send a set of Barley materials from his institute/university which can be evaluated in Bhutan for leaf and yellow rust incidences. This will greatly advertise Bhutan's commitment to participate in ACIAR project for the project management unit to acknowledge our importance in rust epidemiology.
- Professor, as a leader of the project, also ensured his full support in sharing the opportunities for capacity building of our national wheat workers. Though concrete decision on the number of slot or schedule could not be taken at the moment, Professor assured his recommendation and support during the project period.
- The incidence of wheat stem rust reported in past publications and current observation of no stem rust in the field merits further investigation. The data reliability and consistency are vital for both within and abroad for appropriate decision processes. Therefore, Professor assured that his program will support a wheat variety which is highly susceptible to stem rust but resistant to yellow and brown rusts. This variety thus will confirm us whether stem rust fungus is present or absent in our wheat growing area.

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