



the PULSE

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From the project leader



Dear readers,

Our sixth edition of The Pulse newsletter is here with some interesting stories on project advancements, Pakistani project team members' visit to Australia and Australian farmers visiting Pakistan to learn about its pulses production system.

Despite the current situation related to Coronavirus the entire team is confident of keeping the project on track by devising an array of interventions to ensure continuity of on and off farm activities.

We are already in the fourth year of the project and have achieved a number of milestones including farmer led trials to select higher yielding chickpea and lentil varieties, development of both village based and privately run seed production systems and expansion of the area under pulse production, as more and more farmers have adopted pulses in their cropping system. Postharvest value addition activities for increasing farmer profitability have resulted in the production of organic chickpea, chickpea flour (besan) and extra virgin peanut oil thereby opening opportunities of new markets for farmers, processors and entrepreneurs alike.

Dr Ata-ur Rehman
Charles Sturt University



In collaboration with:



Lessons learned from a visit to Australia

By Mr. Niaz Hussain, Arid Zone Research Institute, Bhakkar; Dr. Mahmood-ul Hassan, PirMehr Ali Shah Arid Agriculture University, Rawalpindi; and Dr. Muhammad Ijaz Khan, Agricultural Research Station, Karak

The Australian profitable pulse project team invited us to visit Australia for two weeks in October 2019. This visit provided us with a great opportunity for insights into Australian research and farming systems.

The visit was indeed a manifestation of 'seeing is believing'. Success stories of Australian pulse farmers will be passed onto local farmers and research will be transformed into cultural practice to enhance pulses production in Pakistan on a sustainable basis.

Highlights of the visit included:

- Attending the Australian Pulse Conference in Horsham, Victoria which included visits to pulse farms, farming systems groups and storage facilities.
- Visiting the Food Research and Innovation Centre at Royal Melbourne Institute of Technology (RMIT), Melbourne.
- Visiting Charles Sturt University, Wagga Wagga.
- Visiting Farmlink Research, Temora.
- Visiting New Edge Microbials, Albury.
- Meeting with the NSW Department of Primary Industries, Wagga Wagga.
- Meeting with the Grains Research and Development Corporation (GRDC), Canberra.



During field visits, we were highly impressed by the quality work of agricultural scientists regarding development and testing of faba bean, pea, lentil and chickpea varieties. Besides having good yield, disease resistance, excellent consumer acceptance and better agronomic

traits, many varieties and advanced lines possessed the traits of herbicide resistance.

In most parts of the world, herbicide resistance is incorporated through genetic transformation but to our surprise, Australian scientists had developed these varieties/lines through conventional breeding methods raising no health concerns. We also visited pulse farms and had an opportunity to have a close look at their agronomic practices and storage facilities.



Take home messages

1. Introduction of break crops

Break crops generally refer to pulses or oilseed crops grown instead of cereals. As we observed, it is an integral part of cropping systems in Australia. Pulses (chickpea and lentil) and oilseed (canola) may be promoted as 'break crops' in the irrigated wheat growing belt of Pakistan.

Benefits of break crops:

- Provide a break for important cereal diseases and pest by changing host plant.
- Reduce use of external inputs (inorganic fertiliser).
- Improve the soil condition by regeneration of nutrient.
- Important in the application of integrated weed management.
- Reduce costs through their ability to fix atmospheric nitrogen for their own use and contributing additional nutrients to the subsequent crop and boosting crop yields.

2. Stubble management and zero tillage

Pakistani farmers routinely burn or plough down the stubble as preparation for subsequent crops. This should be discouraged due to concerns about soil erosion, loss of soil organic matter and air pollution/smog. The concept of retaining crop stubble may be popularised and enhanced by minimising the tillage operations.

Although agricultural scientists and extensions workers in Pakistan are aware of this technology, and some experiments have been conducted at research stations, practical demonstrations on such a large scale on farmers' fields was amazing and thought provoking for us. We were fully convinced to arrange such demonstrations at farms of GCR growers of the project.

Key advantages of stubble retention and zero tillage:

- Reducing soil erosion risk.
- Increasing soil moisture content.
- Increasing soil carbon.
- Returning nutrients to the soil, however the amounts depend on the quality and quantity of stubble.
- Reducing expenditures by saving costs of extra and needless ploughings.



3. Use of inoculants

Legumes must be inoculated with the correct rhizobia strain for good return. Successful inoculation improves nodulation, resulting in increased symbiotic nitrogen fixation and yield of the legumes as well as subsequent crops. We hardly found any farmer in Australia who does not apply this technique. In Pakistan, on the other hand, it is hard to find any farmer using this technology. Private companies may be involved in its marketing on a larger scale to harvest the maximum benefits.

4. Capacity building program

Capacity building of farmers is the key to success for any agricultural innovation. We observed that Australian farmers were well connected with researchers, research institutes and the universities; hence their level of awareness was exemplary. Capacity building of farmers in Pakistan must be focused regarding application of climate smart production technology and value addition for sustainable agriculture and rural development.

The following points may be considered in this regard:

- Strengthening of linkages among research organisations, universities, extension workers and NGOs involved in promotion of agriculture is needed.
- Establishment of organisation such as Pulse Australia in Pakistan.
- Establishment of farming groups/ organisations like BCG and Farmlink is necessary for Pakistan.

5. Establishment of donor agency like GRDC

Farmer-led research is also a key point of the current ACIAR project. For an effective delivery, the end users must be part and parcel of the research team. In Pakistan, unfortunately, a lot of research work is not farmer driven.

For practical solutions in the farming community, a farmers' organisation should be established and each member farmer should contribute a specific percentage of his income for research work. Projects proposed by researchers may be reviewed by these farmers before granting the funds.

Grains to seed: The story of chickpea seed in Pakistan

By Israr Hussain, Project Coordinator, Islamabad, Pakistan

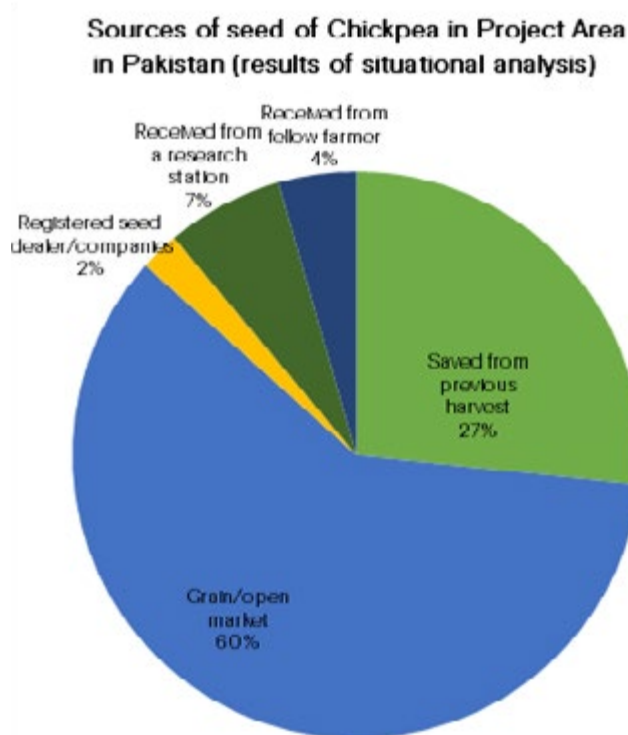
Under the expansion activity of ACIAR funded pulses project "Increasing productivity and profitability of pulse production in cereal based cropping systems in Pakistan", six tons of chickpea and lentil seed was provided to pulse growers in Pakistan for the 2019-20 crop.

It all started with a situational analysis conducted at six major pulse producing districts of Pakistan namely Attock, Chakwal and Bhakkar in Punjab, Karak in Kyber Pakhtunkhwa (KPK), Larkana in Sindh and Jafferebad in Baluchistan provinces during January 2017. It was at this time that pulse growers were given the opportunity to share the bottle necks for pulse production in Pakistan.

The national requirement of chickpea is 700,000 tons and Pakistan imports about 50% of its national requirement from other countries like Canada, Australia and Ethiopia. The average yield is 0.4 tons per acre which is very low. Out of many other constraints mentioned by chickpea growers, non-availability of certified seed of improved varieties was on the top.

The graph illustrates that only two per cent of farmers use reliable seed sources for chickpea production, whereas 98 per cent of the growers are using grain as seed, which is either saved from previous crop, received from fellow farmers or purchased from grain market. This situation was alarming. It all starts with seed. No matter how good the agronomy and plant protection you practice, if the seed is not good, all other efforts are fruitless. To make matters worse, not a single private sector company was ready to invest in the certified seed production of chickpea in Pakistan.

There is a strong reason behind this. About 90 per cent of chickpea is grown in rain fed conditions on marginal land. The desert of Thal is the major production area of chickpea where it is grown as the sole crop for the year. As a crop is not assured, farmers seldom invest in this crop. As farmers do not have the practice of investing in seed, companies are reluctant to produce the certified seed. In this situation, if any farmer wants to invest in seed, there is no seed in the market.



Some research organisations like National Agricultural Research Centre (NARC), Arid Zone Research Institute (AZRI), Ayub Agricultural Research Institute (AARI), Agriculture Research Station (ARS) and Quaid-e-Awam Agriculture Research Institute (QAARI) produces the seed of chickpea but they can only cater a minute acreage of chickpea grown in Pakistan.

This led the ACIAR Pulses project to kick start its activities in field with GCRs. GCR is a Group of Collaborative Research which is established at each project site including the family farmers, researchers from partner institutes, extension workers, service providers, input suppliers and project staff.

The coordination unit of the project collected the seed of fourteen chickpea improved and released varieties from the research institutes of Pakistan. Replicated trials were prepared and dispatched to partner research institutes at six project sites of Pakistan. The replicated trials managed by farmers were conducted at farmer field for two years i.e. 2017-18 and 2018-19.

They were provided with all available chickpea varieties in these trials and were given the opportunity to select the variety of their choice. Farm families were made to visit the trials at two stages of the crop namely flowering and maturity stages along with researchers.

Partner research institutes took the data of yield and yield contributing parameters while farmers scoring was also recorded for each of their visits. Farmers of Attock, Chakwal and Bhakkar chose Bittle 2016 as their preferred chickpea variety. Farmers of Karak and Jafferabad chose Fakhr e Thal while DG 92 was preferred by the farmers of Larkana. Some farmers also scored based on the colour for which the chickpea is paid more in grain market.



Now that farmers have chosen the varieties, the next step was to ensure the availability of certified seed of these varieties on a sustainable basis. In this regard seed systems were developed. One the informal seed system in which a local NGO with the name National Rural Support Program (NRSP) was involved to establish the village-based seed banks at project sites.

Secondly, the project was successful in engaging the private sector Sayban Group of companies for production of certified seed of chickpea. To lay the foundation of an informal chickpea seed system, six tons of certified seed was provided to NRSP farmers at three project sites namely Attock, Chakwal and Bhakkar. Seed multiplied from this will be collected in the village-based seed banks established at these sites.

Next year this seed will be available for the other chickpea farmers of the area. These seed banks will be run by NRSP. On the other hand, Sayban Group was provided with 600kg of pre-basic seed of farmer preferred chickpea varieties for production of basic and certified seed.

Partner research institutes will help in the certification process of the seed from the Federal Seed Certification and Registration Department. This will be the first batch of certified seed of chickpea from the private sector.

On one hand the project is working to make certified seed of chickpea available and on the other it is demonstrating the benefits of using the certified seed to the farming families. This will create the demand of certified seed and will lead to improved chickpea production in Pakistan.



Visit by family farmers to the chickpea varietal trials



Visit by family farmers to the chickpea varietal trials



ACIAR project team visit at Sayban office to develop collaboration agreement



Certified seed with tested technology provided to NRSP farmers in Attock for village-based seedbank



Chickpea-Peanut Fest 2020: An opportunity for the farmers to showcase their value added products

By Abdul Manan Khan, Project Officer, ACIAR Pulses Project, Muhammad Nawaz Shareef (MNS) University of Agriculture, Multan

The ACIAR pulse project aims to promote farmer-led participatory research by emphasising farm level research, in an attempt to diminish the barriers constraining the adoption of new technologies.

The project has been facilitating farmers to realise their potential by developing their capacity to add more value to their harvested crop. In order to achieve this farm families and project researchers evaluated different value addition activities that could result in increased income.

In this regard farmers in the Bhakkar region were apprised about the potential of their postharvest organic chickpea crop. Similarly, peanut farmers in the regions of Chakwal, Attock (Punjab province) and Karak (Khyber Pukhtunkhwa province) were aided to develop cold pressed, extra virgin peanut oil. Both crops produced in the participating farmer's field, including

the soil samples, were tested for any residual pesticides and any chemicals.

The project has helped farmers understand that they can increase their profitability even further through attractive branding and packaging. Consequently, the products were developed and exhibited at the Chickpea-Peanut Fest 2020.

The festival was held on World Pulse Day, on 10 and 11 February 2020 at the Centaurus Mall, Islamabad, Pakistan and was attended by people from all walks of life including political leaders, academics, researchers, government officials, growers, traders, exporters, input suppliers and service providers.

The exhibition highlighted distinctly tasting extra virgin peanut oils from three regions, Chakwal, Attock and Karak, and organic chickpea products from the Bhakkar region of Punjab.



Trying the distinctly flavoured extra virgin peanut oil



Displays of organic chickpeas



Dr. Azhar Iqbal, Plant Pathologist, Pulses Research Institute, Ayub Agricultural Research Institute, Faisalabad delivered a lecture on the life history of Ascochyta blight and Fusarium wilt on chickpea, and strategies for its effective management. Mr. Riaz Ahmad, Entomologist, Entomological Research Institute, Ayub Agricultural Research Institute, Faisalabad delivered a lecture on chickpea pod borer prediction and monitoring, and new approaches to its management. He focused on Integrated Pest Management (IPM) for the effective control of pod borer. He also disseminated the preventive and curative measures of stored grain pests (khapra, dhora etc.) of chickpea as these pests can cause storage losses of up to 10 to 15 per cent.

Mr. Niaz Hussain, Assistant Research Officer (Pulses), AZRI, Bhakkar, visited the chickpea demonstration plot with workshop participants. He gave a practical demonstration of chickpea latest production technology at the site with the concept 'Seeing is Believing'.

After the field visit, Professor Dr. Asif Ali, Vice Chancellor, MNS University of Agriculture, Multan, paid a vote of thanks to the participants. He said the training workshop was a step towards ensuring food security and a reduction of Pakistan's import bill by boosting the production and profitability of the chickpea crop on sustainable basis.

Speaking as a representative of the farmers, a progressive grower of Hyderabad Thal, Mr. Zafar Mehdi Hayat, admired the efforts of ACIAR pulse project Site-3 team organising a very informative and needed workshop for the poor chickpea growers of Thal. He advised that the farming community were very appreciative of the project's support.

The workshop was a successful move towards achieving enhanced and sustainable chickpea productivity. In all, 200 farmers, extension workers, university professors and scientists attended the workshop.



Organic black chickpeas

Three Aussie farmers in Pakistan

By Emily Malone, Web and Communications Officer, Graham Centre

When it comes to growing and marketing pulse crops there's big differences between Australia and Pakistan but as some Australian farmers discovered, there's also common ground and much to be gained from sharing experiences.

Three Australian farmers, Andrew Earle, John Minogue and John Bennett, recently travelled to Pakistan with project researchers A/Prof Gavin Ramsay, Prof Chris Blanchard, Dr Ata-ur Rehman and Penny Heuston.



Mr Earle farms at Mungindi on the NSW and Queensland border and says it was valuable to gain a better understanding of pulse production in Pakistan.

"I was surprised to see that most of the chickpea crop was grown in a much drier region than I was expecting and on poor soil types," he said.

"It was interesting to learn that Pakistani growers view the crop as a high risk and are reluctant to spend too much money to improve yields.

"The difference between the prices Pakistani farmers receive for their pulses and the retail price is much greater than I had expected, if the farmers were able to store and market during the year rather than accepting harvest pricing they would be much better off.

"We certainly have some similar agronomic challenges growing chickpeas in Australia.

"For example we also view the crop as being less reliable than the traditional cereals but with improved management we have been able to make the crop more reliable and profitable.

"The tour also gave me a better understanding of the value of a foreign aid program in terms of maintaining the relationship with Pakistan, which has aspirations of being self-sufficient in pulse production but has major issues with the variable climate."

Project researcher Professor Chris Blanchard said the visit to ACIAR pulse trial sites provided the opportunity to investigate interactions between farmers from two very different systems.

"Despite the language barrier, our Australian Farmers were able to quickly learn from Pakistani farmers about their production systems and discovered that issues facing farmers in Pakistan are similar to those faced by Australian farmers.

"The Australian farmers were able to make several useful recommendations on future experiments the project could explore to assist in improving the profitability of pulse production in Pakistan."

Mr Earle said a highlight of the trip was a farmer field day near Islamabad.

"We looked at chickpea crops and trials and were able to interact with growers and discuss the rotations.

"Although there are very big cultural differences we can share the way that farmers and researchers interact to solve problems for growers.

"Including making sure that farmers are the focus when setting research priorities, rather than just presenting information to farmers," Mr Earle said.



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aciarc.gov.au/project/CIM/2015/041

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