Second season-long Training of Trainers (TOT) Course on IPM

The second TOT was conducted at the same place at the Dehdadi Agriculture Research Farm in Mazar. It was conducted in two phases to avoid the snowfall in January and February. The first phase was from 27 November 2011 for one-month period, and the second phase was from 3 March to 10 June 2012.

Participants: 33 facilitators, mostly plant protection specialists and extension officers from 11 provinces of Afghanistan such as Balkh, Samangan, Bamian, Baghlan, Takhar, Kunduz, Badakhsan, Fariab, Juzjan, Sar-i-Pul and Herat attended the course. Among them, 25 were from Plant protection and Quarantine Directorate (PPQD), five from Extension Directorate, two from Research Directorate and one from Sericulture activity.

Major crops: There were four major crops in the TOT, such as wheat, potato, melon and rice. Wheat was planted in the last week of December 2011 during the 1st phase of the TOT. Potato was planted in the last week of March, melon was planted in the first week of April, and rice was planted in middle of May 2012.

Field studies on wheat

Wheat is the major crop in Afghanistan. Although rust and sunn pest are generally believed to be the major problems in wheat, the real problem is low yields, due to heavy weed infestation. Because of current broadcasting methods of wheat cultivation, both in irrigated and rain-fed wheat, it is difficult to clean weeds. Due to higher labour costs, most farmers prefer to leave the wheat fields unweeded.

Weed is also an important reason for poor growth of wheat plants, which then become more vulnerable to pests and diseases, such as, sunn pest and rust. In the current practice of wheat cultivation, almost 50% of the plant populations are weeds. So the yields that farmers usually obtain from wheat are just half of what could be potentially obtained, if proper weed control is introduced.

Two sets of IPM studies were introduced in the TOT targeting the weed control although the ultimate purpose is to learn how to grow healthy crops. The first set of study is called **IPM1,** mainly the introduction of rakes to make furrow for sowing seeds in perfect rows to allow weeding using rotary weeder. The second set of study is **IPM2**, the introduction of some of the principles of the System of Rice Intensification (SRI), which in wheat is called

the System of Wheat Intensification (SWI). In IPM2 seeds were sown in square allowing both way weeding. Sowing of seeds in both the studies was done in the second week of December 2011 before the snowfall. Five varieties were used in both the studies.

SWI practice

Farmer's traditional practice

Weeding was done only one time using rotary weeders in both IPM1 and IPM2. Plant's growth in both the plots was much better than those of farmers' plots. Yields were significantly higher in IPM1, almost double the farmers' traditional yields, which was almost 5 tons per hectare. In IPM2, there were lots of missing hills because most of the seeds were eaten by birds after sowing. Wheat yields could have been the highest in IPM2, if there had not been any missing hill.

Higher yields of wheat

Field study on potato

The current practice of farmers planting potato in Afghanistan, in one-time-prepared larger ridge at the time of sowing, does not facilitate any follow up operation for weed control. Weed infestation then becomes an important problem in most of the potato field. Because, weed is a major host for harbouring insects and disease in potato field, farmer's current problem of Colorado Potato Beetle (CPB) infestation can be successfully managed, if proper weed control can be introduced through follow up operations of earthing up and top dressing.

In the production studies, potatoes were sown in small ridge followed by two times earthing up to increase the ridge size, one at two weeks and the other at four weeks after germination of potato seeds. During earthing up weeds were automatically cleaned. The earthing up allowed timely and right application of manures/fertilizers as top dress, providing opportunity for better growth and production of potato. *There has been no problem of Colorado Potato Beetle at all in any of the plots.*

The land was equally distributed among the five groups to establish production study. Like wheat, each group used a different variety to compare their performance. Potato seed (sprouted) was sown from 25 to 27 March 2012.

The other studies included seed production using True Potato Seed (TPS), variety performance trial, soil fertility management trial and comparison between cut seed and uncut seeds. The area for these concept specific studies was around half acre. Each group of participants was given a particular study to establish, while sharing the results with other groups.

Field study on Melon

Studies on Melon were similar to those of the first TOT. Melon field was nearly an acre, which was divided into two parts. In the first part, melon was grown using plastic mulch. After sowing seeds, the entire field was covered with very thin plastic. This helped preserve soil moisture, and thus there was no need for any supplementary irrigation. It was also effective to suppress weed growth, reducing the production cost largely. Because of effective weed control and adequate moisture in the soil, plant's growth in the first part with plastic mulch were more vigorous and the number of fruits per plant was much higher than in the second part where farmers' traditional method was used. Bagging was used in both the parts. Both plastic and cloth bags were used. Both the bags provided complete protection against melon fly infestation. To avoid sun burn, plastic bags needs to be removed once the size of the melon gets bigger. Melon fly infestation is more vulnerable when the melon is young and the skin softer.

Melon with plastic bag

Use of plastic mulch

Field study on Rice

In the first TOT, the performance of rice was highly appreciated both by the participants and visiting farmers. In the second TOT, it was, basically, the replication and adaptation of SRI. The adaptation trials compared the performance 13 days old single seedling with double seedlings per hill with half, quarter and zero dose of chemical fertilizers as generally used by the farmers.

Before planting rice, clover was as grown as green manure and mixed into the soil at the age of 35 days. All the trials were equally distributed to the five groups of participants. Rice was planted in the third week of May. Before the participants left on 11 June 2012, they were able to conduct the first weeding using rotary weeder and got an overall idea on how to grow SRI. The main purpose of the rice study was to conduct a third TOT exclusively on rice for the extension officers of three major rice growing provinces in the east of Afghanistan such as Nangahar, Kunar and Laghman which started immediately after the completion of the second TOT. .

The training used the similar methodologies as used in the first TOT. Similarly, a field day and graduation ceremony was organized at the end of the TOT on 10 June 2012. Heads and representatives from different government agencies of MAIL and DAIL, including the Donor agency and the representative of FAOR attended the field-day. In addition, there were 150 farmers from various communities across Balk province attended the field-day.