Improving livelihood of potato farmers in Afghanistan

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Abstract

Afghanistan has ideal conditions for potato production. The present national average yield of 16.8 t/ha could be increased to 25 t/ha if farmers obtain good quality seed. There is no formal or informal seed system existing in the country. In 2002, the International Potato Center (CIP) initiated a project on the production, multiplication and diffusion of good quality informal seed to increase potato production. In all 94 farmers and 118 extension workers were trained by CIP on improved agro-techniques for good quality informal seed production. Good quality seed of existing varieties Kufri Chandramukhi, Kufri Lauvkar, Cardinal and Desiree were imported from India and Pakistan and given to 41 farmers in Nanghar province. CIP, for the first time introduced a seed potato production system in the autumn season of 2002. Farmers in this province normally produce potato in the early spring season and therefore were not keen on planting potato in autumn. After one season however, farmers were convinced of the possibility to produce high quality seed potatoes in autumn. Seed produced by farmers in Nanghar province in autumn was stored in Jalalabad. In March, the seed was transported to Kabul and distributed to 53 farmers of Wardak, Kabul and Bamyan provinces in Afghanistan. The average tuber yield of 49 farmers for the three varieties ranged between 21.7 to 33.5 t/ha. The farmers obtained higher yields and therefore higher incomes by planting good quality seed and adopting improved production techniques. The availability of good quality informal seed at affordable prices to poor farmers is therefore expected to increase national potato productivity.

Media summary

Introduction of good quality basic seed of potato varieties and improved agro-techniques in Afghanistan increased potato yield from 16.8 to 26 t/ha.

Keywords

Informal seed, agro-techniques, autumn, spring

Introduction

The agriculture system in Afghanistan has been completely destroyed by civil conflict for nearly 20 years. The productivity and quality of both agricultural and horticultural crops have reduced due to non-availability of good quality planting material. Potato is one of the important crops of Afghanistan. The agro-climatic conditions of Afghanistan are ideally suitable for good quality potato production. Potato is cultivated in nearly 14,000 ha with an average yield of 16.8 ha. Potato is grown during spring in mountains and during fall in the plains in irrigated lands. Kufri Chandramukhi and Kufri Lauvkar are popular varieties in Afghanistan. Both varieties are short duration; white skinned, and has high dry matter and good keeping quality. Beside these, red skinned varieties Desiree and Cardinal are also grown in selected pockets. There is no formal seed system existing in the country. The potato produced in the hills during spring is used as seed for both spring and fall planting. A part of the spring produce in high hills is retained as seed to plant in the next season. For fall planting, the farmers buy seed from hills. Seed is stored in country stores built underground in the mountains. There is no refrigerated store in the country. Farmers are not aware of good seed production techniques and most farmers have been using the same seed for the last 15 years.

In 2002, the International Potato Center (CIP) initiated a project on the production, multiplication and diffusion of good quality seed for increased production in Afghanistan. The main objectives of the project were: i) to diagnose and characterize the existing potato seed systems and constraints for production in the country, ii) to train farmers and extension staff of the Department of Agriculture and NGOs on improved techniques for good quality potato seed production at farm-level, iii) to import good quality seed of high yielding varieties from neighboring countries, multiply at farmers' field and provide to farmers in different regions for increased production and improved quality.

Methods

The participatory approach was adopted to implement good quality seed production, multiplication and diffusion at farm-level. 24 farmers in 2002 and 17 farmers in 2003 were selected in Nanghar province to produce good quality seed in the autumn season. 53 farmers were selected in Kabul, Wardak and Bamyan provinces to multiply seed in the spring season of those produced in Nanghar during autumn. 94 farmers selected for seed multiplication in autumn and spring seasons and 118 extension workers of the Ministry of Agriculture and Livestock, the Kabul University, the International Center for Agricultural Research in the Dry Areas (ICARDA) and NGOs were trained on seed production technologies at farm-level. In 2002, 2 MT seed of Kufri Chandramukhi from India and 10 MT seed of Cardinal and Desiree from Pakistan were imported. In 2003, 4.5 MT seed of Kufri Chandramukhi, 3.2 MT of Desiree were imported from India. The imported good quality seed was provided to selected farmers in Nanghar province in 2002 and 2003 to be multiplied in the autumn season. The seed produced in Nanghar province by improved seed production techniques was purchased back from farmers. The seed was treated with 3% boric acid before the dormancy was broken. The treated seed was transported to Kabul in March 2003 and provided to framers to multiply in the spring season.

Results

The farmers in Nanghar province plant potato in early spring. They plant seed in February and harvest the crop in April. Potato produced during this season is sold as ware potatoes. The aphid population during this period is above thresh-hold level and the potatoes produced at this time can not be used as seed. The aphids are vectors for viruses. Farmers of Nanghar and other provinces growing potatoes during early spring have to be dependent on hill seed. They buy seed every year. CIP for the first time introduced the seed potato production system in the autumn season in Nanghar province. Good quality potato seed could be produced in the autumn (September/October to December/January) season. The temperatures are ideal and aphid population is negligible during this period. In the first year, it was very difficult to persuade farmers that they could produce good quality seed at their fields in the autumn season. Farmers in the plains and low elevations are accustomed to grow potatoes in early spring. But after experiencing production in one season, the farmers were convinced of being able to produce good quality seed in autumn by adopting improved management practices. In the first year, farmers planted seed of Kufri Chandramukhi, Cardinal and Desiree varieties in the last week of October/November and harvested in January/February. In the second year, farmers were able to plant seed timely in September/October. The crop vigor and health standard of the seed crop were very good. The plants infected with viruses and off type plants along with tubers were removed from the seed plots. Field training on IDM (integrated diseases management) was provided to farmers and extension workers during the crop season. The crop was dehaulmed 15-20 days before harvest to prevent the spread of viruses, obtain maximum seed size tubers and to harden the tuber skin. In the first year, 29.3 MT seed was purchased from farmers. The seed was treated with 3% boric acid to prevent the spread of skin born diseases with seed into new areas. Boric acid treated seed was kept in heaps under the shade of trees in Jalalabad to break dormancy.

The seed produced and stored in Jalalabad was transported to mid elevations Kabul in March. The seed was distributed to 53 farmers of Wardak, Kabul and Bamyan provinces. The farmers planted seed in March/April at mid elevations (Kabul/Wardak) and in May at higher elevations (Bamyan). All farmers adopted recommended improved management practices for seed multiplication. The farmers harvested the crop in August/ September. 49 farmers who planted seed of Kufri Chandramukhi, Cardinal and Desiree varieties obtained average tuber yields between 21.3 to 33.5 t/ha (Table.1). The seed produced

in the spring season was purchased and treated with boric acid. The seed was kept in country stores and supplied to farmers in new areas.

Table 1. Informal potato seed production in spring 2003 in Afghanistan.

	Tuber Yield (t/ha)			
Variety	**Site-1**	**Site-II**	**Site-III**	**Mean**
Kufri Chandramukhi	28.87 (5)	23.41 (4)	48.30 (5)	33.53
Cardinal	18.23 (4)	28.88 (2)	22.50 (3)	23.20
Desiree	13.71 (7)	17.68 (10)	32.42 (9)	21.27
Average yield	20.27	23.32	34.40	

Number of farmers is given in parentheses.

The participating farmers in Nanghar, Wardak, Kabul and Bamyan provinces were impressed with the high quality seed that helped in increased tuber yield. The farmers of Nanghar were convinced that they could produce good quality seed potato in the autumn season as seen in Figure.1. The farmers of this area can take two crops of potatoes in one year. They could sell the autumn produce as seed and early spring season crop as ware potatoes. Farmers had a higher yield and higher income by planting good quality seed and adopting improved techniques in comparison to farmers who planted poor quality seed and adopted traditional practices. The farmers were convinced that they could double the potato production by planting good seed and adopting optimal cultural practices. The seed produced by improved agro-techniques in the plains in the autumn season and in mid/high hills during the spring season could be used successfully for 4-5 generations without significant reduction in the yields. The availability of good quality seed at affordable prices will help poor farmers to replace old poor quality seed with new seed. The living standard of poor farmers are expected to improve by increased productivity and better quality potatoes.

Figure 1. Potato crop planted for informal seed production in the Autumn season in Afghanistan.

Conclusion

The adoption of improved technology and good quality starter planting material increased potato productivity and quality. The income of poor farmers increased by enhanced productivity. The potato growers of Nanghar province of Afghanistan were convinced that they could produce a high quality seed in the autumn season. Farmers in both lowlands and highlands were glad and confident that they could use the same seed for 4-5 generations without reduction in yields if recommended management practices were followed.