CRP Dryland Systems
Technical report – 2014

Cluster of activity
Identify and introduce stress tolerant, high-yielding and improved quality varieties of cereals, potato, vegetable, horticultural, fodder crops through on-farm adaptive trials.

Reporting Centers: AVRDC and ICARDA

Action Site: Fergana Valley

National partners:

- Uzbek Research Institute of Plant Industry, Kibray
- Akmal Matmusaev Farm, Rovot Village, Kuva District, Fergana Province, Uzbekistan.
- Kakhramon Davlat Sakhovati Farm, Takyon Tepa village, Kuva District, Fergana Province, Uzbekistan.
- Davlat Ganimat Farm, Marckamat District, Andijon Province, Uzbekistan
- Mirzaakhmad Sakhovati Farm, Marckamat District, Andijon Province, Uzbekistan

Outputs:

- Four new varieties of mungbean evaluated in winter wheat-mungbean rotation.
- Three-year wheat-mungbean rotation experiments established in four farmers' fields to study economic profitability and effect on soil nutrients.
- Nine farmers participated in seed production of four improved varieties of mungbean.
- Mungbean seed (1.5 kg) distributed to 4 home gardeners (2 male + 2 female).

Outcomes:

- Three new varieties of mungbean were identified suitable for wheat-mungbean crop rotation.
- Four farmers' fields with wheat-mungbean crop rotation established to study economic profitability and effect on soil nutrients.
- Due to additional crop of mungbean, the participant farmers earned USD 1384 to USD 2907 from 0.5 ha.
- Seed production in the amount 6.5 ton of 4 varieties of mungbean for planting in 2015.
- One ton seed of one improved variety of vegetable soybean produced for planting in 2015.
- Ten kilogram seed of one improved variety of long-yard bean (*Vigna unguiculata*) produced for planting in 2015.

Detailed report

Introduction

Agriculture in Fergana valley is the most important branch for a food security and farmers' income. At present time there is cotton and wheat based system which not allows to agronomic crop rotation and soil fertility is decreasing constantly. Water resources deficiency in a hot summer time also limits of repeated crops growing. Therefore within SCP was decided to conduct trial in winter wheat and mungbean based crop rotation for improving of soil fertility and production of value product with a limited irrigation.

Mungbean is very popular crop in Uzbekistan and wide used for a food. There are late maturing local varieties with uploading stem and dehiscent pods. During last years AVRDC-CAC jointly with the partner Uzbek Research Institute of Plant Industry have developed and released new mungbean varieties which compare to local varieties have an up-right bush, big size grain, not dehiscent pods and appropriate for mechanized seed sowing and harvesting.

Also other AVRDC new legume vegetables such vegetable soybean and yard-long bean were involved in trials on a small area to identify their further potential.

Fergana Valley.

Adaptive trials have been initiated with participation of Water Users Association's specialists of "Qodirjon Azamjon" in Fergana and "Tomchi kuli"in Andijan Provinces. Total four farmers' farms were involved in the adoptive trials.

1. Fergana Province

Adaptive trials were initiated in two farms at summer term of sowing. Seeds of mungbean varieties were sown on a designed plan (0.5 ha sown area and 0,5 ha uncropped area) including: 'Durdona' variety in "Akmal Matmusaev" farm located in Rovot village and 'Marjon' variety in "Kakhramon Davlat sakhovati" farm located in Takyon tepa village of Kuva district.

Also seeds of the following varieties were sown separately as a demonstrational field: mungbean (Durdona and Turom), vegetable soybean (Sulton and Universal) and yard-long bean (Oltin soch). This trial was initiated in the farm "Akmal Matmusaev" to conduct Farmers' Field Day in September 2014 also. Some mungbean varieties seeds were distributed for four home gardens also and a plot size was 0.01- 0.03 ha in each garden.

2. Andijan Province

Adaptive trials were initiated in two farms at summer term of sowing. Seeds of mungbean varieties were sown on a designed plan (0.5 ha sown area and 0,5 ha uncropped area) including: 'Zilola' variety in "Davlat Ganimat" farm and 'Turon' variety in "Mirzaakhmad sakhovati" farm of Marckamat district.

RESULTS

Fergana Province

Seeds of mungbean varieties have been sown after winter wheat harvest (4- 14 July). During a vegetation period recommended cultivation technology was conducted on mungbean fields. Harvest of yield was conducted on 2-13 October. Average yield of 'Durdona' variety was 2.1

t/ha. Mungbean ‘Marjon’ variety yield was low (1.6 t/ha) as during a vegetation period pods were damaged by a borer what was a reason for decreased a total yield (Table 1).

Table 1. Mungbean varieties yield in Kuva district, Fergana Province, 2014.

Farmers’ farm	Variety	Date of sowing	Date of seed germination	Date of harvest	Days from seed germination to-harvest	Harvested yield (kg/0.5 ha)	In terms of yield, t/ha
“Akmal Matmusaev” farm, Fergana	Durdona	04.07.	10.07	02.10	83	1049	2.1
“Kakhramon Davlat sakhovati” farm, Fergana	Marjon’	14.07.	22.07	12.10	81	800	1.6

A net profit of cultivated varieties in two farms depended from variety harvested yield and it seed quality. The highest net profit (4512000 uzbek sums or in- equivalent to US$1868) was at growing of mungbean variety ‘Durdona’ (Table 2).

Table 2. Net profit at growing of mungbean varieties in Kuva district, Fergana Province (2014)

Farmers’ farm	Variety	Uzbek sum	In terms of US dollars
“Akmal Matmusaev” farm (0.6 ha)	Durdona Marjon Zilola Turon	4 512 000	1868 (3114/ha)
“Kakhramon Davlat sakhovati” (0.5 ha)	Marjon’	3 343 000	1384 (2768/ha)

Seeds of the following varieties sowed separately as a demonstrational field in the farm “Akmal Matmusaev” were multiplied, including mungbean (Turon) -25 kg, and yard-long bean (Oltin soch) - 10 kg.

Seeds of the following varieties were multiplied in demonstrational plot of Andijan station of RIPI: mungbean ‘Zilola’ – 50 kg, mungbean ‘Turon’ -50 kg, vegetable soybean ‘Sulton’ – 1000 kg.

Four mungbean varieties seeds distributed for home gardens had average yield 2.2 t/ha and seeds in a total amount 225 kg were multiplied (Table 3).

Table 3. Mungbean varieties multiplied seeds in households (Kuva district, Fergana Province, 2014.

#	Householders in Fergana Province	Variety	Multiplied seeds, kg	Yield in-equivalent t/ha
1	M. Erkaboev	Durdona	52	2.3
	M. Erkaboev	Marjon	29	2.2

2	Kh. Goziev	Zilola	31	2.1
3	S. Khusanov	Turon	65	2.3
4	S. Dusmatov	Marjon	48	2.1
	Total:		225	
	Average yield:			2.2 t/ha

Andijan Province

Seeds of two mungbean varieties have been sown after winter wheat harvest (9-12 July). During a vegetation period recommended cultivation technology was conducted on mungbean fields. Harvest of yield was conducted on 27-30 October. Average yield of 'Zilola' variety was 2.4 t/ha. Mungbean 'Turon' variety yield was 2.6 t/ha (Table 4).

Table 4. Mungbean varieties yield in Markhamat district, Andijan Province (2014)

Farmers' farm	Variety	Date of sowing	Date of seed germination	Date of harvest	Days from seed germination to-harvest	Harvested yield (kg/0.5 ha)	In terms of yield, t/ha
"Davlat Ganimat" farm, Andijan	Zilola	09.07	15.07	27.10	103	1440	2.4
"Mirzaakhmad sakhovati" farm, Andijan	Turon	12.07	18.07	30.10	103	1560	2.6

A net profit of cultivated varieties in two farms was high. The highest net profit (7022000 uzbek sums or in- equivalent to 2483US$) was at growing of mungbean variety 'Turon' (Table 4).

Table 4. Net profit at growing of mungbean varieties in Markhamat district, Andijan Province (2014)

Farmers' farm	Variety	Uzbek sum	US$
"Davlat Ganimat" farm, Andijan (0.5 ha)	Zilola	6 022 000	2493 (4986/ha)
"Mirzaakhmad sakhovati" farm, Andijan (0.5 ha)	Turon	7 022 000	2907 (5814/ha)

Soil analyses. The analyses of the soil taken before mungbean sowing and after harvest of a yield confirmed that mungbean is a good crop for cultivation after winter wheat and to promote of the soil fertility improvement (attachment 1).

CONCLUSION

Mungbean varieties growing in Fargana valley and Urganch showed its potential. Farmers welcomed new mungbean varieties and would like to continuing to grow mungbean from

multiplied seeds especially of mungbean varieties ‘Durdona’, ‘Zilola’ and ‘Turon’. Total 2150 kg seeds of 4 varieties were multiplied.

Seeds of other potential crops have been multiplied for further introduction, including vegetable soybean ‘Sulton’ – 1000 kg and yard-long bean – 10 kg, During 2014 seeds of promising AVRDC tomato line L06161 (200g) was multiplied in the Uzbek Research Institute of Vegetable, Melon Crops and Potato for further adaptive trials.

During a vegetation period farmers and responsible specialists were trained to probation work and necessary documentation filling for certificated mungbean seeds production. In 2015 certified mungbean new varieties seeds will be distributed to other farmers in the action sites.