ICARDA

Science for resilient livelihoods in dry areas

Capacity Development Report

Cactus pear (*Opuntia ficus-indica*) crop management to increase productivity and enhance awareness about cactus cochineal in West Asia (Second event)

August 25th, 2020

Prepared by: Sawsan Hassan (ICARDA - Jordan) and Mounir Louhaichi (ICARDA – Tunisia)

Co-authors/contributors/collaborators: Awad Kaabaneh (NARC, Jordan)

NARC
المركز الوطني للبحوث الزراعية
National Agricultural Research Center

CGIAR RESEARCH PROGRAM ON Livestock

August 2020

NARC- ICARDA - Capacity Development

Field Day Report

Activity title: Enhancing Innovation and Technology Dissemination for Sustainable Agricultural Productivity in Arab Countries through consolidation of center of excellence across the region with focus on innovations and scaling in agro-pastoral farming systems in West Asia

Action site: Mushaqqar research station, Madaba (Jordan)

Sub-activity: Enhance the capacity of Mushaqqar research station as a platform of biodiversity conservation

Source of funding: Arab Fund for Economic & Social Development (AFSED) – W3/Bilateral

REF team leader: Dr. Mounir Louhaichi

NARC focal point: Mr. Awad Al-Ka'abnh

Key national partner: National Agricultural Research Center (NARC), Mushaqqar Regional Research Station, Madaba, Jordan

Objectives: Enhance capacity building about cactus best agronomic practices, promote dissemination of new elite accessions and increase awareness about cactus cochineal

Target audience: Smallholder farmers and extension agents

Activity mapped to CRP: CGIAR Research Program on Livestock

Lead Center: International Livestock Research Institute (ILRI)

Flagship: Livestock and Environment

Field day agenda

Date: 25 August 2020

Location: Muchaqqer research station, Madaba, Jordan

10.00 AM- 10.15 AM **Participants arrival**

10.15 AM-10.30 AM **Welcome Address**

Mr. Awad Al-Ka'abnh, Head of Muchaqqer Research station,

Dr. Sawsan Hassan, ICARDA

10.30 AM-11.00 AM **PowerPoint presentation on cactus pear use and importance**

Dr. Sawsan Hassan

11.00 AM-11.45 AM **Visit to the cactus pear germplasm collection**

All participants

11.45 AM-12.15 PM **Survey on new** ca**ctus pear accessions fruits taste**

12:15PM- 1.00 PM **Lunch**

Introduction

Cactus pear (*Opuntia ficus indica*) is widely cultivated in arid and semi-arid regions worldwide. Cactus pear provides good quality foods (fruits, juices, marmalades), cosmetics, and medicinal products and plays an important economic role as a forage and fodder provider for subsistence agriculture with minimal agronomic inputs and for their resistance to drought. Cactus pear is well known in Jordan and is cultivated in many areas for fruit production which have a good market value. Also, it is planted at the edges of farms and gardens as a biological fence. The cultivated area of this plant in Jordan is estimated at 300 ha mainly in the Jordan Valley, Madaba area and Irbid area (Katbeh Bader and Abu-Alloush, 2019).

Within the collaboration program between the National Center for Agricultural Research and the International Center for Agricultural Research in the Dry Areas (ICARDA), more than 100 accessions of cactus pear were introduced and planted in Muchaqqer station. These accessions have different genetic characteristics in terms of productivity, specifications and purpose of use and were collected from different countries such as Italy, Brazil, America, Argentina, Tunisia, Morocco, Mexico and other countries. This activity is sponsored by the Arab Fund for Economic and Social Development (AFSED).

The cactus pear germplasm collection consists of different accessions for fruit production which showed good performance, they produce fruits with different flavors and colors ranging from red, yellow to green also they vary in terms of colors, productivity and different in terms of days to maturity date: there are early, moderate and late maturity accessions. These new cactus pear accessions are an opportunity to help farmers to diversify their products and income and they will be distributed to farmers through the National Agricultural Research Center (NARC).

The main goal of organizing field days is to introduce farmers and other stakeholders to new technologies and procedures so that they could see how these technologies or procedures could be practically used and applied, in addition to exchange information and knowledge among farmers and different stakeholders in which they can directly or indirectly benefited from it. Based on this approach, the use of field days to demonstrate the new technologies is a perfect tool to increase awareness and knowledge of these technologies.

Following the introduction of cactus germplasm in Jordan, a short video was broadcasted through the national TV showing the cactus pear accession diversity, a huge interest from farmers and different stakeholders was raised and many requests from farmers were sent to clarify the possibilities of obtaining theses accessions. Therefore, field days became essential tools of showing these new accessions and demonstrating their diversity and performance in the field (Heiniger, 2002). Importance of these field days for the farmers and other stakeholders comes

from learning methods to practically adopt these accessions and apply the recommended r management practices in their individual situation.

In August 25th, 2020, in partnership with the National Center for Agricultural Research, the International Center for Agricultural Research in the Dry Areas (ICARDA) organized a successful farmers' field day in Muchaqqer Research station on cactus pear fruit production, benefits, use and management.

On this event more than 18 participants from different cities took part. Among these, 12 were farmers from Mleh which is considered as the main area of cactus fruit production in Jordan. The goal of the field day was to catalyze the use and production of cactus pear. The program has a focus on cactus pear genetic resources diversity, cactus pear requirements, benefits and multifunctionality. The main objectives of this field day were:

- Promote and increase the level of knowledge of farmers about cactus pear requirements and management
- Increase the awareness of participants about the threats of cactus pear cochineal scale
- Farmers' assessment of the fruits of the new cactus pear accessions demonstrated during the field day.

Structure of the field day event

- Welcoming remarks
- Presentation on Cactus pear importance, diversity, use, value chain and best management and cactus pear cochineal scale pest management
- *Dactylopius opuntiae* (cactus pear wild cochineal) threat and management
- Field visit to cactus pear germplasm collection
- General discussion
- Taste the new cactus pear accessions fruits and fill a survey on consumer perceptions and purchase behavior to report attitudes and criteria of consumers preferences

Key highlights

The program started with the opening speech from Mr. Awad Kaabneh , Head of Muchaqqer Research station who welcomed the farmers and highlighted the importance of cactus pear germplasm collection at Muchaqqer Research station. He indicated that the unique cactus pear collection can be used as a source to provide the new accessions to farmers for improving their livelihood of through fruit production diversification.

Dr. Sawsan Hassan welcomed the participants and addressed them about ICARDA's mission as an international organization that conduct research for development in the dry areas. She mentioned that ICARDA in collaboration with different partners in the world is working to promote cactus as multiple purpose crop.

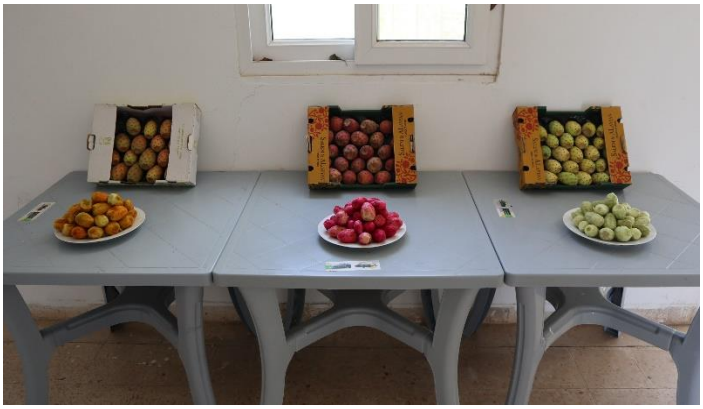
Afterward she displayed a PowerPoint presentation on why cactus is important. Cactus pear multifunctionality, cactus use as a fodder, the impact of cactus uses as a green fodder on milk and meat production. She mentioned the basic rules that farmers must follow when they provide cactus to their animals. During the presentation, Dr. Sawsan showed the high diversity of cactus pear fruits around the world, she highlighted the nutritional value of cactus pear fruits and the importance of following the correct and suitable agronomic practices to guarantee high production. She emphasizes on the importance post-harvest and packaging techniques to increase fruits shelf life. Dr. Sawsan indicated that cactus can be used as a mean for improving the livelihood of farmers through other agro-industrial and medicinal products. Dr. Sawsan briefed the farmers about the best cactus pear agronomic practices such as plant spacing, row spacing, plant requirements and best planting time. And she highlighted the role of ICARDA as technology Provider. In the last part of the presentation Dr. Sawsan highlighted the importance of rising awareness of the threats of cactus pear cochineal scale indicated that the control methodology depends on integrated management which include emergency plan to control and reduce the spread of this pest by increasing awareness, applying pesticides. Also, to remove the

heavy infected plants and burn them. She insisted on the importance of the role of best agronomic practices (mainly pruning) to control cactus pear wild cochineal. Along with these, Ministry of Agriculture and research institutes should work to look for natural enemies of this pest in Jordan, some medicinal plants that have insecticidal properties. All these activities should be conducted based on researcher-farmer participatory approach. The presentation was followed by an open discussion, and a questions and answers session.

Later, farmers were invited to visit the cactus pear germplasm where farmers were able to differentiate the cactus pear accessions and the different fruits colors and size. Farmers were able to compare the fruit sizes as well as maturity date of different cactus pear accessions. Farmers shared his positive feedback about cactus pear accessions and appreciated the opportunity to see and learn about these new accessions. During the field visit, general discussion was made where all participants were able to ask questions, forward comments and suggest on how cactus can be scaled up in the future. The major issues raised by the participants were how to get the new cactus pear accessions, Dr. Sawsan Hassan not only took the feedbacks and the opinion of the famers present in the event but also added more information on cactus cultivation and answered all the inquires of the farmers.

After that farmers were invited to taste three types of cactus pear fruits (white color fruits, red color fruits and Yellow color fruits (common one)) and they were requested to answer small survey to express their opinion about the fruits of new cactus pear cessions:

- Identify the most attractive fruit type
- Identify the sweetest accessions type
- Identify the softest seed type (seedless)
- Identify the crunchiest type
- Which are better the local fruits, or the new ones tested today?
- Would you buy the new fruits even if they are more expensive?
- Are you willing to plant the new accessions in your farm if plant materials become available?



The results showed that the white fruits type had the highest preference of the farmers, it was more attractive, sweeter and continued the softest seeds among the three types, both red and white type fruits were crunchier that the yellow type (Figure 1)

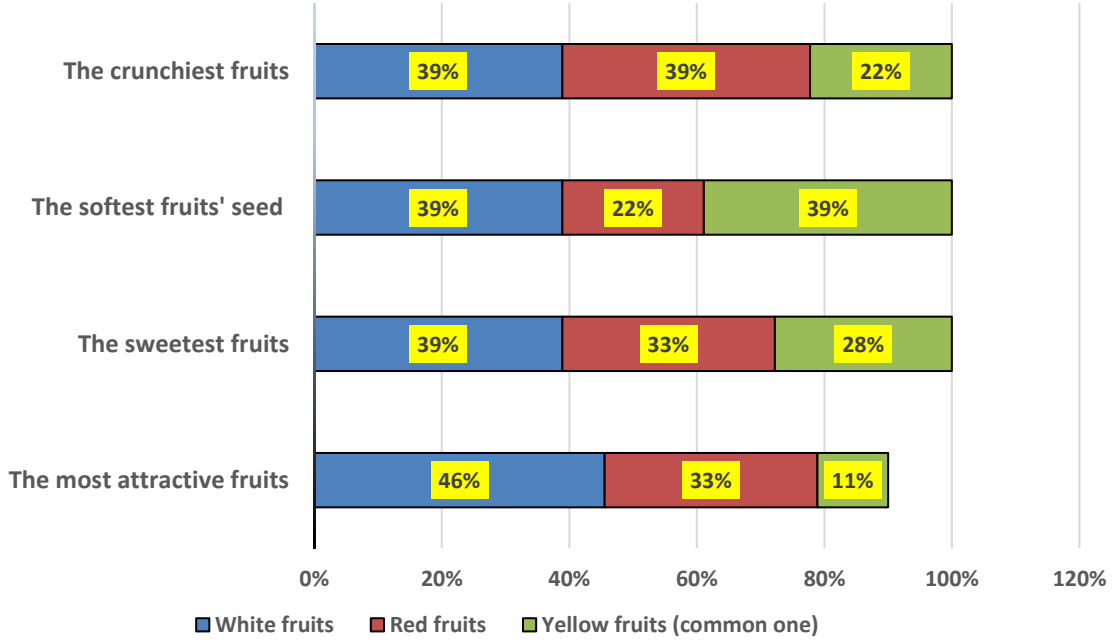


Figure 1. Farmers' preference about the new cactus pear fruit types planted in Muchaqqer Research station, Jordan

Farmers think that new types are better than the common ones and they showed big interest in growing the new accessions in order to produce the new fruits types. Framers expressed the high economic value of the new cactus pear accession as they are willing to pay higher prices to get the new cactus fruits (Figure 2) which show the importance of these accessions as mean to prompt the livelihood of cactus pear growers.

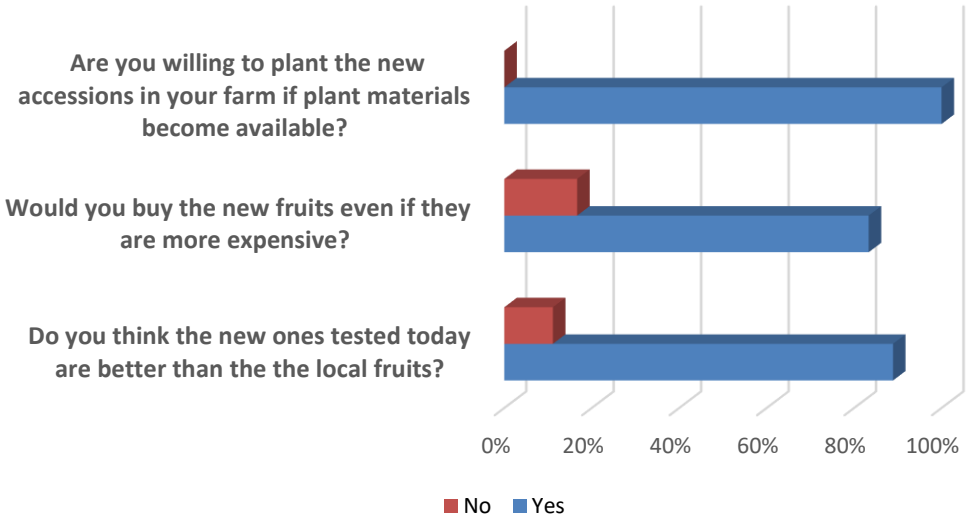


Figure 2. Farmers' opinion in Jordan about the new cactus pear fruits type planted in Muchaqqer Research station, Jordan

Conclusion remarks

- The participants were impressed by the cactus pear germplasm collection and by the work done to preserve these elite accessions.
- Farmers showed great interest for these new cactus pear accessions which could be a potential new technology to enhance the productivity of cactus pear at the farm level and eventually improve the livelihood of small holders in Jordan.
- Awareness on the cactus pear diversity, use and benefits have also been created and the feedback received for future scaling.
- Awareness about the threats of cactus pear cochineal scale was created
- With no exception, all the participants in this event requested planting material to plant them in their farms.

References

Katbeh Bader, A.M., Abu-Alloush, A.H. 2019. First Record of the Cochineal Scale Insect, *Dactylopius opuntiae* (Cockerell) (Hemiptera: Dactylopiidae), in Jordan. Jordan Journal of Biological Sciences, 12 (2), 155 – 159

Heiniger, R.W. 2002. Seeing is Believing: The Role of Field Days and Tours in Precision Agriculture Education. Precision Agriculture, 3, 309–318

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List of Participants

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Science for resilient livelihoods in dry areas

NARC
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National Agricultural Research Center

CGIAR
RESEARCH PROGRAM ON Livestock

Strengthening Innovation and Technology Adoption towards Sustainable Agricultural Productivity in Arab Countries

Cactus field day

Muchaqqer research station August 19th 2020

Participants list

#	NAME	SIGNATURE	*Permission
1	[illegible]		☑
2	علي محمد ناصر العمري		☑
3	فواز محمد ابوذياب		☑
4	[illegible]		☑
5	[illegible]		☑
6	[illegible]		☑
7	[illegible]		☑
8	وليد سليم بطاينة		☑
9	[illegible]		☑
10	[illegible]		☑
11	[illegible]		☑
12	[illegible]		☑
13	[illegible]		☑
14	[illegible]		☑
15	[illegible]		☑
16	[illegible]		☑
17	صهيب عزالدين الخطيب		☑
18	[illegible]		☑

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