

ASLP II Citrus Project

**National Agriculture Research Center
(NARC)
Islamabad, Pakistan**



Project Objective

1. To improve nursery production practices and introduce germplasm to extend the marketing season

- 1.1 Select & establish superior germplasm**
- 1.2 Establishment of screen house**
- 1.1 Germplasm multiplication & distribution**

2. Research Capacity

3.1 Nursery research training

1.2: Establishment of screen house

Problem: Diseased trees planted in the orchard

- **Solution :** Insect proof screen house
- Produce stronger clean trees for planting
- Better nursery trees result in productive orchards



Screen-house: NARC (Completed in 2012)



Outcomes

- Propagation from mother trees in clean environment
- Industry nursery is based on clean bud-wood

1.2 Screen house adoption

2X nurserymen adopting screen house

- **Green Valley, Jhang Bhatar (built)**
- **Latif-ur-Rahim (KP) (in progress)**



1.2 Training

- **NARC Disease Free Clean Citrus Nursery workshop Oct 2012**
 - **8 researchers, 2 university students & 23 commercial nurserymen**



3.1 Research Capacity : Student training

Mr. Zeeshan Arif Bahaudin Zikria University

Mr. M Abbas Khan University of Agriculture Faisalabad

- Effect of storage period on viability and germination of citrus rootstock (Sour orange) grown in two different medias.
- Effect of different concentration of GA3 Treatments on the germination and growth of Citrus seed (sour orange).



1.1: New Citrus germplasm

Problem: Industry reliant on one variety with narrow production period

- **Extend production season**
Expand market opportunities domestic & export.
- **Extend employment opportunities for laborers (landless poor).**

1.1 Import of Citrus Germplasm

Rootstock (Seed from Australia)

1. **Poncirus trifoliata**
2. **Troyer citrange**
3. **Carrizo**
4. **Benton**
5. **C-35**
6. **Fraser hybrid**
7. **Cox mandarin**
8. **Cleopatra mandarin**

1.1 Import of Citrus Germplasm

Scion varieties (Bud-wood from Australia)

1. McMahon Valencia
2. Arnold blood
3. Harvard blood
4. Ryan navel
5. Daisy mandarin
6. Cara cara
7. Salustiana



1.1 Establishment of Mother Plants in Screen-House (Scion varieties)



Citrus Germplasm Mother Plants kept in NARC Screen House

1.1 Germplasm Multiplication

Citrus Scion varieties

S.#	Cultivar	Trees Produced
1	McMahon	40
2	Arnold blood	12
3	Harvard blood	26
4	Ryan navel	36
5	Daisy mandarin	273
6	Cara cara	237
7	Salustiana	12
8	Fremont	81
9	Hockney	56
10	Hamlin	13
11	Beyenda Valencia	40
	Total	629

Rootstock:

Rootstock ready for budding September, 2015: 480 plants

Rootstock will be available in Spring 2016: 880 plants



1.1 Establishment of Open Field Mother Block

Scion varieties

Sr. No.	Scion Cultivars	No. of Trees
1.	Hamlin	31
2.	Salustiana	31
3.	Kinnow LS	79
4.	Torocco	68
5.	Ryan navel	23
6.	Harvard blood	22
7.	Daisy mandarin	37
8.	McMahon Valencia	32
9.	Cara cara	16
10.	Arnold blood	13



1.1 Select & establish superior germplasm

1.1 Establishment of Open Field Mother Block

Rootstock

**Rootstock Mother Block at NARC
(5 trees each variety):**

1. Poncirus trifoliolate
2. C-35
3. Benton
4. Cox mandarin
5. Troyer Citrange
6. Rough lemon
7. Cleopatra mandarin
8. Carrizo Citrange
9. Sour orange



1.1 Bud-wood distribution (Commercial Nurseries)

Trees produced to establish **their own mother blocks**

Cultivar	Awan nursery	Al- Imran nursery	Mujahid nursery
Cara Cara	14	7	12
Arnold blood	17	12	10
Daisy mandarin	17	23	14
McMahon	22	13	7
Harvard blood	18	30	16
Ryan navel	16	10	19
Salustiana	12	7	9
Total	116	102	87

1.1 Tree distribution **to growers**

**Sardar Tariq Khan of Fate
Jhang 7 plants of each variety
(13.09.2013).**

1. McMahan Valencia
2. Arnold blood
3. Harvard blood
4. Ryan navel
5. Daisy mandarin
6. Cara cara
7. Salustiana

**Mr. Amjad of village Uttian,
Sargodha 20 plants of each
variety (15.10.2014).**

1. Tangor
2. Hockney
3. Hamlin
4. Cara cara
5. Daisy mandarin
6. Beyenda Valencia

1.1 Rootstock distribution

Ten trees each variety provided **to commercial nurseries** to develop their seed blocks (ready for production 2018)

Rootstock

1. Poncirus trifoliata
2. Troyer citrange
3. Carrizo
4. Benton
5. C-35
6. Fraser hybrid
7. Cox mandarin
8. Cleopatra mandarin

Commercial Nurseries

1. Awan Nursery Farm, Haripur
2. Al-Imran Nursery Farm Pattoki
3. Mujahid Nursery Farm Pattoki
4. Sultan Nursery Farm Sargodha
5. Roshan Nursery Farm Bhalwal
6. Modern Zamindar Nursery Farm Peshawar

1.1 Continuing distribution of scion

New Gov. project (July 2015-18): “Development of Clean and True to Type Fruit Plant Nurseries at National Level”.

- **Cost: PK Rs. 49.750 million**
- **Four Gov. institutes propagate trees to provide ~ 500 growers with test trees of new ASLP citrus varieties.**
- **Training of 50 commercial citrus nurserymen (nursery manual & training package).**
- **Continue to provide clean bud-wood to nurserymen.**

1.1 Communication

Government officials and policy makers



1.1 Select & establish superior germplasm

1.1 Communication

Mass media Campaign

3X Tv interviews on “Certified Nursery plant production”

- Atv, Sohni Dharti and Such TV.
- Interviews repeated screening about 15 times





Australia-Pakistan Collaboration
AUSTRALIAN CENTRE FOR INTERNATIONAL AGRICULTURAL RESEARCH (ACIAR)
PAKISTAN AGRICULTURAL RESEARCH COUNCIL (PARC)
Agriculture Sector Linkages Program
Australian AID
ASLP CITRUS PROJECT-II
SCREEN HOUSE FOR DISEASE FREE
CITRUS GERMPLASM MULTIPLICATION

THANK YOU

