

ASLP PHASE-II CITRUS RESEARCH INSTITUTE (CRI), SARGODHA



OBJECTIVES : CRI

- 1.0 New variety and rootstocks & nursery training
- 2.0 Crop management: irrigation & pruning
- 3.0 Research extension and capacity building.

1.0 New variety and rootstocks & nursery training

1.1 Select and establish superior germplasm

1.2 Establishment of screenhouse

1.3 Germplasm evaluation training

Establishment of screenhouse

Problem: Unhealthy and diseased nursery plants to cause poor performance of citrus orchard

Solution: Raising of plants in screenhouse

- Production of vigorous and clean nursery trees
- Enhanced health and productivity of the trees in orchard establishment



Outcome: Industry is based on clean bud-wood

1.1 & 1.2 New variety and rootstocks & screenhouse

Screenhouse

- Two of each variety remain in screenhouse
- Produced a total 312 trees

Name of Varieties	No.
Daisy mandarin	25
Nules mandarin	3
Caffin mandarin	13
Arnold blood	22
Harvard blood	48
Salustiana - common	90
Hamlin - common	3

Name of Varieties	No.
Keenan Valencia	5
Mc Mahon valencia	32
Benyenda Valencia	3
Fischer navel	3
Lane late navel	5
Ryan navel	31
Cara Cara navel	29

1.1 & 1.2 New variety and rootstocks & screenhouse

Screenhouse production

- 244 trees provided to the 30 citrus growers



Remaining 68 trees will be distributed during 3rd week of September

1.1 & 1.2 New variety and rootstocks & screenhouse

New modern Rootstocks

CRI mother block plantings

- Benton
- Carrizo citrange
- Cox mandarin hybrid
- Troyer citrange
- C- 35 citrange
- Cleoptera mandarin
- Fraser hybrid
- Poncirus trifoliata



Also planted in repository (Sodhi Jai Wali)

Status:

Rootstocks will produce seed in 2018 and will be provided to nurserymen and growers.

1.1 & 1.2 New variety and rootstocks & screenhouse

1.3 Rootstock evaluation trial

- 66 trees
- 3 X scions: Kinnow, Musabi & Fuetral Early
- 6 X rootstocks: Troyer, Bentan, Carrizo, Cox mandarin, C35, Cleopatra, Poncirus Trifoliata
- Commence fruiting 2016



1.1 & 1.2 New variety and rootstocks & greenhouse

3.1 Nursery production training

- 150 nursery men were trained: potting media & grafting



3.1 Nursery production training

2.0 Crop management: irrigation & pruning



Pruning trial (2012-15)



Un Pruned Kinnow



Light Pruning



Medium Pruning



Heavy Pruning

Pruning trial results 2014

Parameters	Medium Pruning	No Pruning
Fruit Weight (g)	190	174
Fruit Size (mm)	76	73.6
Yield (Kg)	126	103

Adoption: ~ 25 % growers in Sargodha in three years



2.0 Crop management: irrigation & pruning

Future plan

- Reworking and propagation of recently identified very low seeded Kinnow **40 Ha on growers**
- Provide clean budwood from screen house to nurserymen (12) to develop private mother blocks
- New varieties evaluated (export potential) – 10 X demo grower sites
- ASLP-II Rootstock (disease resistant & semi dwarf) seed available (2018), grow rootstock plants, promote with furrow irrigation adoption
- varietal diversification of local and exotic materials (scion and rootstocks)
- Training of grower using ASLP II packages
 - Furrow irrigation 4/year ~ total 400 growers
 - Pruning 2/year ~ total 200
 - Nursery 1/year ~ 100
 - Crop management 2/ year ~ 300 grower

2.2 Irrigation Management

Irrigation demonstration trial



Flood



Furrow



Drip



Sprinkler

Results of Furrow vs Flood

Year	Furrow Yield (kg/tree)	Flood Yield (kg/tree)	Water saving	Increasing Yield
2014-15	245	112	47%	54%
2013-14	207	141	41%	31%
2012-13	123	97.7	41%	20%
2011-12	168	124	57%	26%
Avg.	186	119	46.5	33%

Out come: 2011 - 2015

Furrow irrigation superior over flood in terms of water saving. Yield and over all plant health was found good.

2.2 Irrigation Management

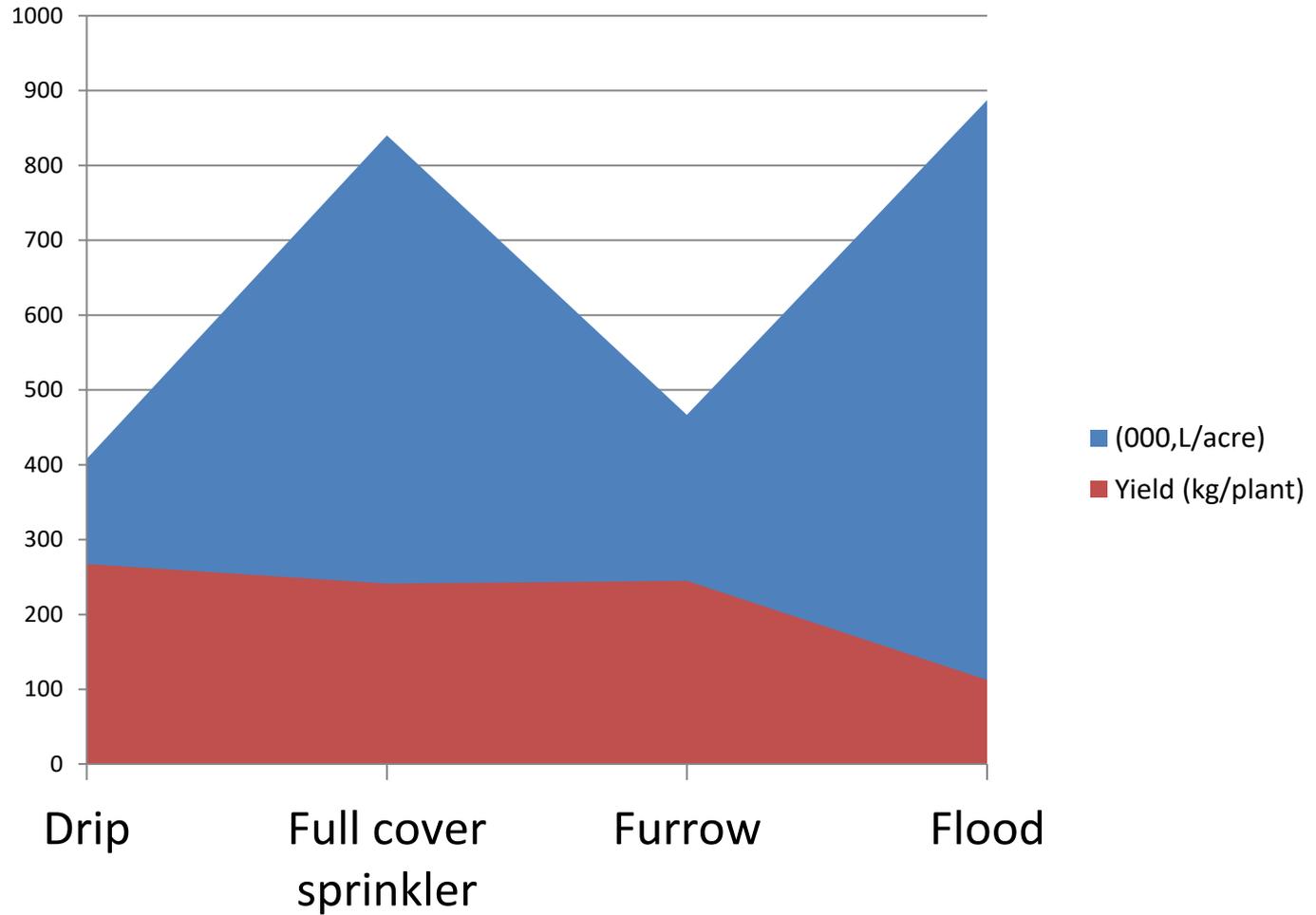
Results of Pressurised Irrigation System

Years	Drip (Kg/plant)	Full cover sprinkler (Kg/plant)	Flood Yield (kg/tree)	Water Saving (%) as compared to Flood
2014-15	267	241	112	54
2013-14	205	147	141	69
2012-13	134	102	97.7	24
2011-12	119	113	124	42
Average	181	151	119	47

Drip irrigation system found better as compared to flood and sprinkler systems in term of yield and water saving

2.0 Crop management: irrigation & pruning

Comparison of yield and total water used during (2014)



Comparison of yield and total water used during (2014)

Year (2014)	(000,L/acre)	Yield (kg/plant)
Drip	408	267.45
Full cover sprinkler	840	241.16
Furrow	466.6	244.82
Flood	887.19	112.36

Conclusion/outcomes of Irrigation Trials (2011-12 to 2014-15)

Average Fruit yield: 36 % more in furrow

- **Furrow 185.52 Kg/tree**
- **Flood 118.7 kg/tree**
- **Furrow irrigation used 47 % less water than flood**

Drip Vs Flood

Average Fruit yield: 34 % more in Drip

- **Drip 181 kg/plant**
- **Flood 119 kg/plant**
- **Drip irrigation used 47 % less water as compared to flood but can be saved up to 70 %**

Drip Vs Full cover sprinkler

- **17 % more fruit yield in Drip irrigation**

Drip Vs Strip cover sprinkler

- **35 % more fruit yield in Drip irrigation**

2.0 Crop management: irrigation & pruning

3.2 Training of Researcher / extension staff

Capacity Building: 19 workshop, total participant 1174

Workshop

- Crop load estimation & fruit thinning (300 people)
- Reworking (100 people)
- Disease management (400 people)
- Crop management: Pruning, Irrigation, Nutrition (374 people)



3.0 Research extension and capacity building.



Citrus Quality Fruit, Payment & Outcomes
ASLP-II Citrus Training Package



Citrus Reworking
ASLP-II Citrus Training Package



Irrigation Management
ASLP-II Citrus Training Package



Citrus Best Practice Australian Study Tour
ASLP-II Citrus Training Package



Citrus Canopy Management
ASLP-II Citrus Training Package



Citrus Nutrition Management
ASLP-II Citrus Training Package



Citrus Nursery Management
ASLP-II Citrus Training Package



3.0 Research extension and capacity building.



Training on Tensiometer (60)



Soil pit examination (soil texture ,pH etc)
(45 people)



Soil pH testing through pH kit (colour chart)



3.0 Research extension and capacity building.

Demonstration of fruit thinning
(70 people)



Furrow establishment)

Training on Full stop installation(35 people)



Training at CRI on fruit thinning to citrus growers and extension worker (65 people)

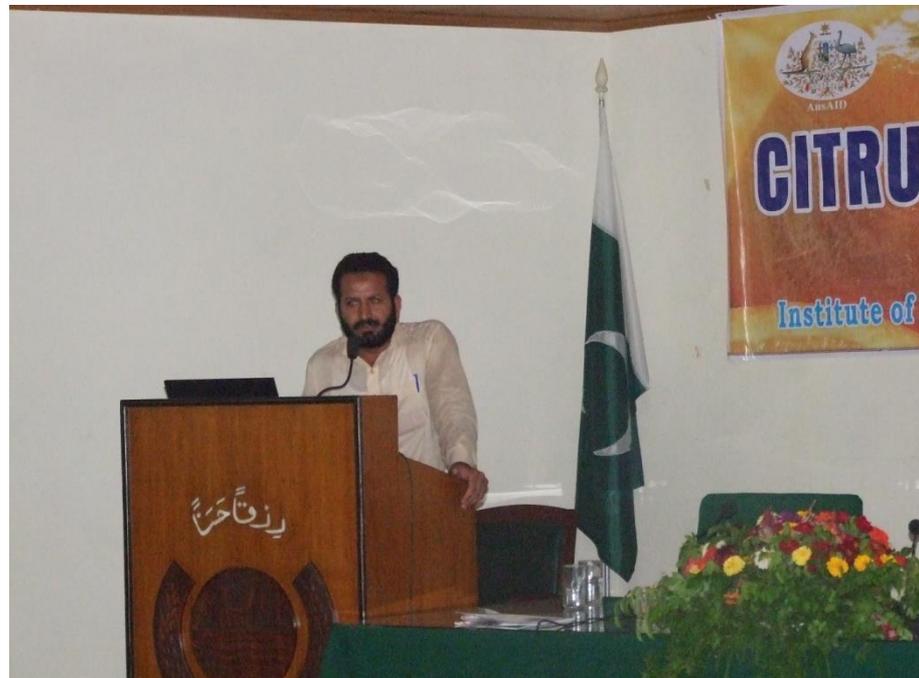


Training on Reworking at CRI, Sargodha(20 people)



3.0 Research extension and capacity building.

Citrus growers conference at UAF (200 people)



On Farm outcomes

Outcome

Irrigation

- 206 acres of furrow adopted by (50 citrus growers).



Jalal Da Gohar, Sargodha



**Sardar Shaukit Mehmood
Maken Sultanpur Bangla**



Furrow at sultanpur banglow



**Aamir Iqbal 10 ML Behera road
Bhalwal**

Outcome

Pruning Practices

Adoption: ~ 25 % growers in Sargodha in three years



3.0 Research extension and capacity building.

Outcome

Reworking at Roshan farm (Bhalwal)



Outcome

Nursery Training

Screen House at Mr. Afzaal Nursery



Outcome screenhouse



THANKS