

#### Development Action Planning (DAP)

#### 35<sup>th</sup> International Vegetable Training Course

"Vegetables: From seed to Table and Beyond"



World Vegetable Center – ESEA/Oceania

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**Country:** Sultanate of Oman

Organization: Ministry of Agriculture and Fisheries

Directorate General of Agriculture & Livestock Research

Vegetable Crops Production Researcher

# **Responsibilities:**

- Vegetable Crops Production Researcher in Field & Protected Greenhouses
- Vegetable Crops Production Researcher in Soilless Culture Techniques ( Open & Close System)
- Screening and Evaluation of Vegetable Crops Under Field and Greenhouses
- > Evaluation of different tomato varieties against late blight disease under field conditions
- > Training School , University Students and Farmers in Greenhouses Vegetable Production
- > Training School , University Students and Farmers in Soilless Culture Techniques

# Introduction

- > Tomato Crop is One of the main vegetable crops in Oman
- Mostly grown in North and South Al Batinah Governorates
- > Area is about 3400 Feddan (Feddan =  $4200 \text{ m}^2$ )
- The annual production is about 82000 tons
- Cover 82% for Domestic Consumption
- The economic returns around 11 Million R.O. (1 R.O = 2.59 US \$ )



Three Topics Very Important :

Fungal Disease in Vegetable Crops

➤Grafting in Some Vegetable Crops

Irrigation for Vegetable Production

#### **SULTANAT OF OMAN LOCATION**



>Oman is located in the extreme southeast of Arabian Peninsula.

- ≻The location is between 16° 40' and 26° 20' North and 51° 50' and 59° 40' East.
- Coastline extends for some 3165 kilometers.
- > The Sultanate faces three seas, the Arabian Gulf, the sea of Oman and the Arabian sea.
- Land borders with UAE (North), Saudi Arabia (West) and with Yemen Arab Republic (Southwest).

#### **OMAN IN FACTS AND FIGURES**

LAND AREA	3009,500 SQ. KM
TOTAL POPULATION	4,236,057 (2014)
CAPITAL	MUSCAT
OFFICIAL LANGUAGE	ARABIC, ENGLISH
RELIGION	ISLAM
TIME ZONE	GMT+ 4 HOURS
CURRENCY	OMANI RIAL ( 1 OMR = 2,59 USD , 2,34 EUR )
CLIMATE	JUNE , 31-48 C° AND JANUARY , 20-25 C°



- > Agriculture and Fisheries have been the principal activities of the people in the Oman.
- > Development of Agriculture towards self-sufficiency is the main objective of the government.
- Government provides new technologies to the farmer and train him in modern methods as well as to give him guidance and advice.
- > Innovations and technology are being introduced (Soilless Culture techniques, greenhouses).
- > Training and demonstrations of new agriculture equipment, irrigation systems and improved crop varieties.

- Climate in Oman varies from arid, humid and tropical (South).
- The maximum temperature goes up to 50 c °in summer and the minimum is even less than zero in some mountain areas.
- > The rainfall is scanty and no specific period (o 100 mm).
- In Southern area (Dhofar Governorate) where there drizzling to heavy rainfall during monsoon from June to September (100 mm).
- > Groundwater is the main source for irrigation and domestic use.
- The percentage from the total of production (Ton) comprised 22% vegetables, 27% fruits, 1% field crops and 50% fodder crops.
- the percentage from the total of area (Feddan), 19% vegetables, 45% fruits, 7% field crops and 29% fodder crops (Ministry of Agriculture and Fisheries, CENSUS 2014).

# Activity: Late Blight Disease in Tomato Cultivars



The Problem and Why its Important to Solve :

## Late blight in Oman

## First report in 2013

- North and South Al Batinah Governorates
- Loses of crop reaches 100% in some places
- Reduction of production reaches 30-90%

# Presence of late blight 2015



# Symptoms of late blight



- Infection of late blight disease started Middle of January and lasted until February.
- High humidity and accompanying rains played a role in spreading the disease.
- $\clubsuit$  The pathogen is favored by cool ( 15 c°) and wet weather ( 90 % ).
- The local production of tomatoes has been damaged and quality has dropped.

# Causal agent of late blight disease and Control





- > To evaluate the performances of tomatoes cultivar under field and greenhouse condition
- > To determine the growth, yield, quality and disease resistance
- > To determine the best cultivars in yield ,quality and disease resistance



Agriculture in Oman is faced with several serious constraints relating to different factors:

- > Salinity in both irrigation and the soil.
- > Marketing of production.
- Harsh weather.
- > Cost of inputs (Seeds, Agro, and Chemicals).
- Limited of sources of good quality irrigation water.
- Lack of integrated pest management.
- > Rural exodus to big cities.

## The challenges could be alleviated by the following actions and activities:

- > Build dams and used the modern irrigation system.
- > Multiple canning and processing factories which may absorb excess production.
- > Expansion of protected vegetable and high value cropping.
- Improved cultural and husbandry practices and the corporation between the agricultural and private sectors is very important.
- Improved water –use efficiency.
- Introduction of new technologies such as soilless culture and greenhouses.
- Integrated pest management is straggly advocated and needs to be given priority by relevant scientists.
- Prevent a rural exodus by setting up programs of rural education and to ensure that communities make the best use of limited water resources for maximum productivity.

## **Expected benefits:**

Improvement of vegetable crops will lead to the following benefits:

- Utilization of high quality seeds.
- Increasing the size and efficiency of production farms.
- Increased productivity and availability of vegetables to consumers.
- Improved water-use efficiency.
- Improved the quality and quantity of vegetable crops.
- Resistance to the pest and disease.

## The target audience (Beneficiaries) :

- 1- School and University Students
- 2- Farmers
- 3- Ministry of Agriculture and Fisheries (Agriculture Research and Extension)
- 4- Private Sectors (Agro Chemical Companies)
- 5- Local markets and Export
- 6- Canning and processing factories

#### Human Resource :

1- Ministry of Agriculture and Fisheries2- Private Sectors

#### Activities and Duration:

1- Increase of Vegetable Crops Production for Domestic Consumption and Export.
2- Use New Technology in control late Blight Disease such as Weather Station (Forecasting) and New Sprayer for Fungicides.

3- Use Resistant New Tomato Cultivars Against Late Blight Disease.

4- Workshops and Field Visits.

#### Duration: 2017 - 2020



SR.NO	Agriculture Research Departments List	Governorate
1	Directorate General of Agriculture & Livestock Research	RUMAIS
2	Plant Production Research Center	RUMAIS
3	Plant Protection Research Center	RUMAIS
4	Soil & Water Research Center	RUMAIS
5	Date Palm Research Center	RUMAIS
6	Livestock Production Research Center	RUMAIS
7	Animal Health Research Center	RUMAIS
8	Agriculture & Livestock Research Department	DHOFAR
9	Agriculture Research Department	NORTH BATINAH
10	Agriculture Research Department	SOUTH BATINAH
11	Agriculture & Livestock Research Department and Tissue Culture Center	INTERIOR
12	Agriculture Research Department	AL-SHARQIYA

#### Number of completed and ongoing plant research projects

Field Of Research	2011		2012		2013	
	Completed	Ongoing	Completed	Ongoing	Completed	Ongoing
Vegetables &	3	10	1	8	3	9
Green houses						
Horticulture	-	-	-	-	8	9
Field crops	1	7	2	8	2	11
Tissue culture	-	4	4	3	2	4
Food industry	1	3	1	7	3	6
Genetic	3	7	10	8	8	4
resources						
Insects	9	10	6	8	2	6
Plant pathology	9	9	5	9	-	10
Toxics residues	4	5	3	3	1	2
Soil and water	6	10	2	17	3	15
<b>Biological control</b>	11	10	4	5	3	4
Total	47	75	38	76	37	80



#### Vegetable Crops Production (1000 Ton) in the world 2009

SR. NO.	Country	Production	Area	World		
		(1000 Ton)	(1000 Hec)	Production %		
1	CHINA	459558	24827	49.0		
2	INDIA	90757	6549	9.6		
3	USA	37813	1171	4.0		
4	TURKEY	26733	1107	2.8		
5	EGYPT	20275	746	2.2		
6	IRAN	16351	665	1.7		
7	RUSSA	14827	765	1.6		
8	ITALY	13645	523	1.4		
9	MEXICO	12101	6693	1.3		
10	NIJERIA	10839	1617	1.2		
11	BRAZIL	10449	453	1.1		
12	OKRANIA	9009	540	1.0		
13	INDONESIA	9096	969	0.9		
14	VITNAM	7991	671	0.8		
15	PHILIPIN	5325	628	0.6		
16	PAKISTAN	5481	435	0.6		
17	BANJLADAISH	3362	455	0.4		
18	CAMIRON	1411	412	0.1		
117	OMAN	207	11	0.02		
WORLD TOTAL (	181 COUNTRIES)	941149	54739			
SOURCE: FAO, 2010						



Tomatoes crop under protected greenhouse



## Muskmelon crop under greenhouse



## Beans varieties under cooling greenhouse



Beans pod

Beans at flowering stage



Beans varieties

## Some vegetable crops in soilless culture (close system)



### Some vegetable crops in tub culture (close system)



# Lettuce and parsley plants

## Pests & diseases



Muskmelon wilting disease



Root rot disease



Powdery mildew



Red mites

Aphids

Mealy bug



GH view front



GH view back (cooling pads)



Shade net house (non-cooling)



Agryl sheet

Substrate media (nursery)



Fertilizer injection tanks



Fertilizers dosing machine



Prepare perlite for planting



Pots planted with seedlings



Yellow and blue sticky traps



Metrology device



Tomatoes crop

Potato crop

Leafy crop (radish)

# THANK YOU.

