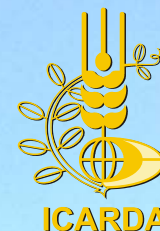
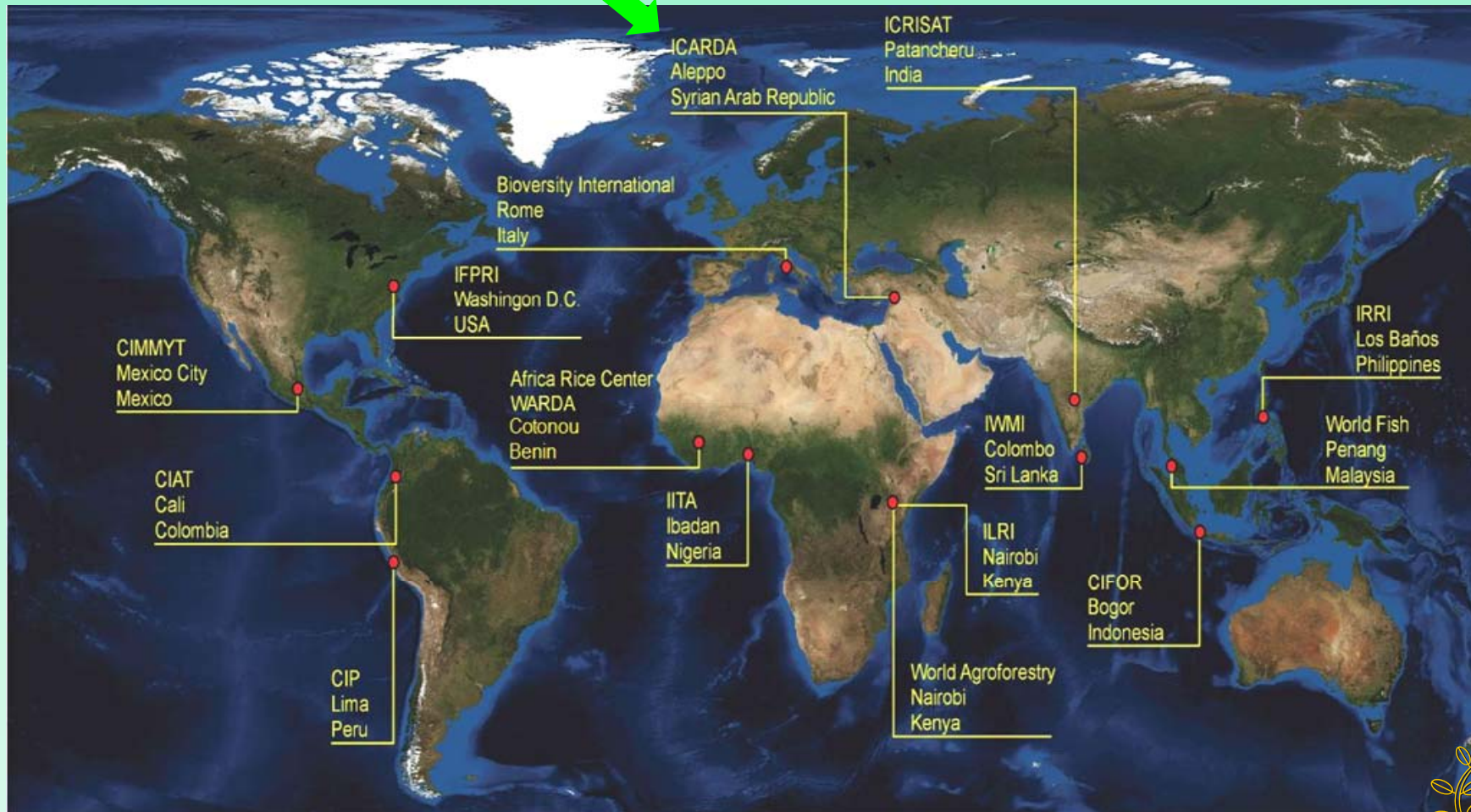


# Drought Preparedness & Sustainable Agriculture



**Hassan Machlab, Country Manager-Lebanon**  
**The International Center for Agricultural Research in the**  
**Dry Areas - ICARDA**

# ICARDA as a CGIAR Center

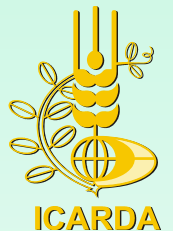


# Mission & Mandate

To contribute to the improvement of livelihoods of the resource poor in dry areas by enhancing food security and alleviating poverty through research and partnerships to achieve sustainable increases in agricultural productivity and income, while ensuring the efficient and more equitable use and conservation of natural resources.

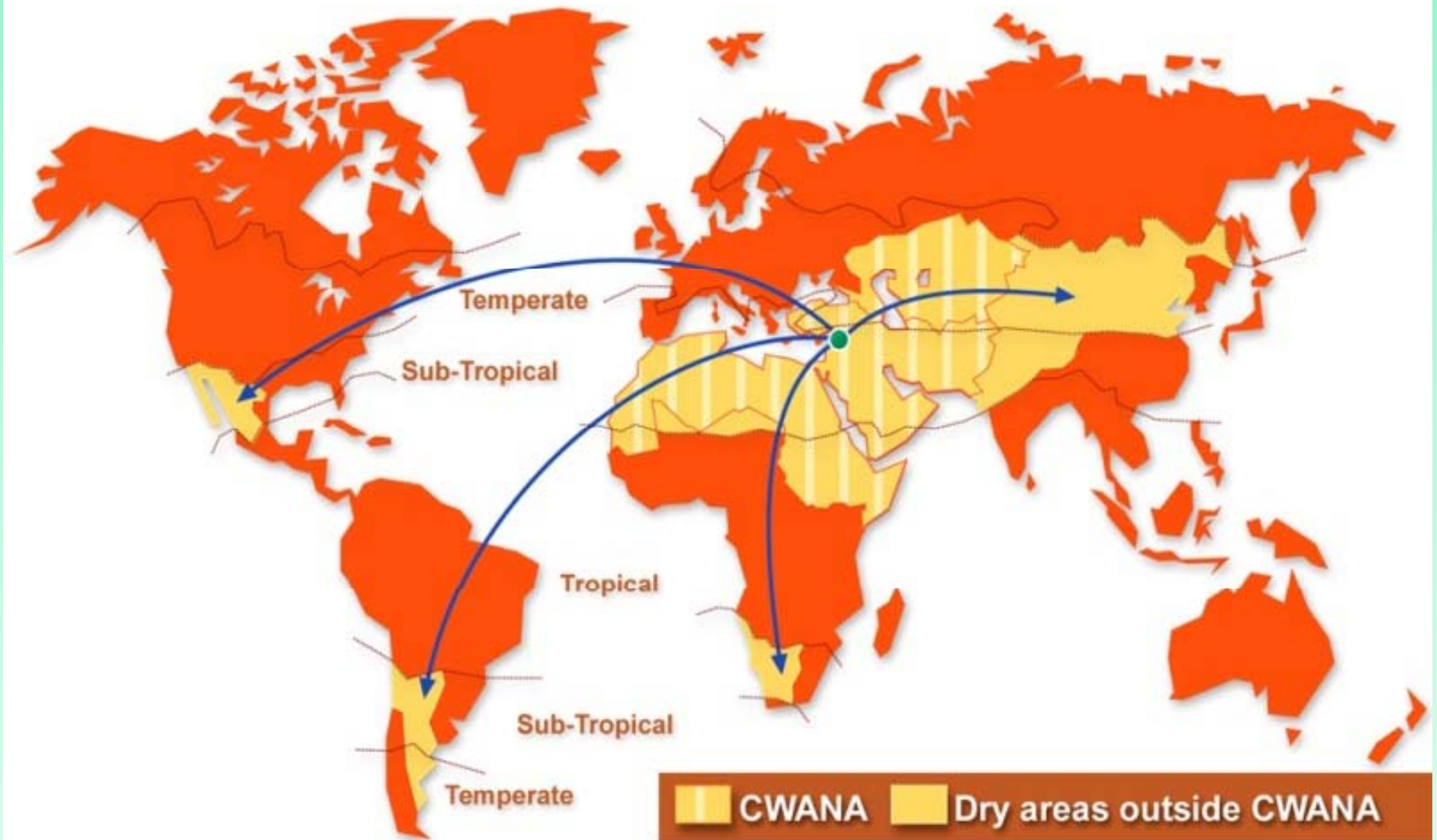
## Leading CRP 1.1 on DRYLAND SYSTEMS

- Global mandate for improvement of Barley, Lentil & Faba Bean
- Regional mandate for improvement of Wheat & Chickpea



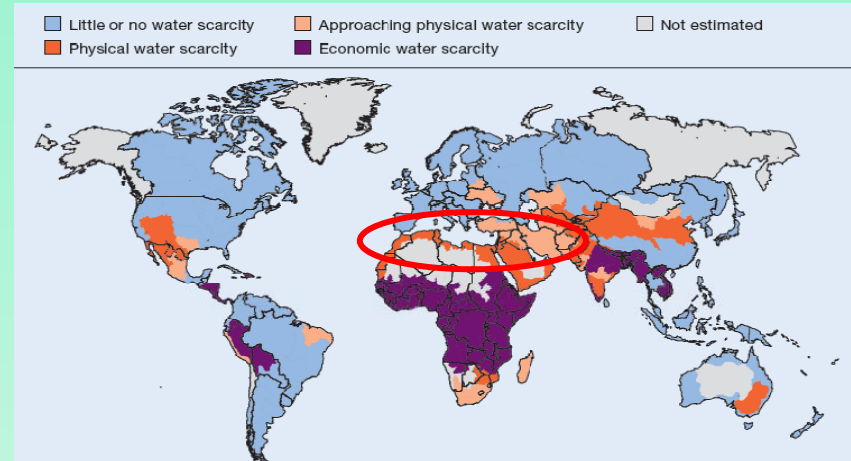


# ICARDA's geographic mandate



# DRY AREAS: A Fragile Eco-System

- Droughts are to be expected wherever precipitation varies from year to year. Therefore, drought is not confined to low rainfall areas only. But yes, they do vary in severity.
- WANA region which is 57% hyper-arid and 21% arid is particularly vulnerable to drought.



- Physical water scarcity
- Rapid natural resource degradation and desertification
- Groundwater depletion
- Drought
- Salinity
- Climate change

# Drought & CC preparedness and mitigation

## **ICARDA's measures are centered on:**

- Improvements in crop production and breeding new varieties for drought tolerance
- Land and water management through various techniques such as water harvesting, deficit and supplemental irrigation.
- Integrated Crop-Livestock management, non-conventional sources of Feeds to mitigate the effect of drought.
- Sustainable agriculture (no-till or minimum tillage systems).
- The assessment of existing community, national and regional strategies and policies for the preparedness and mitigation of drought and climate change
- Enhancing linkages and cooperation between countries on drought preparedness and mitigation
- Developing methodologies for characterizing drought in the major dry area environments

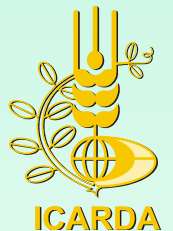
# Crop Improvement: Varieties Released using ICARDA Germplasm Worldwide, 1977 to 2010

	1977 - 2010		Last 2 years
<b>Crop</b>	<b>Developing Countries</b>	<b>Industrialized Countries</b>	<b>All Countries</b>
Barley	175	31	6
Durum Wheat	102	14	1
Bread Wheat	224	6	9
Chickpea	108	31	9
Faba Bean	51	6	1
Lentil	96	16	9
Forages	30	2	2
Peas	9	0	0
Sub-Total	761	120	
<b>Total</b>	<b>881</b>		<b>37</b>



# Varieties Released

- High yield potential
- Agronomic traits: e.g. earliness, canopy architecture
- Tolerance to abiotic stresses:
  - Drought
  - Heat
  - Cold
  - Salinity
- Resistance/tolerance to biotic stresses
  - Diseases
  - Insect pests
  - Parasitic weeds

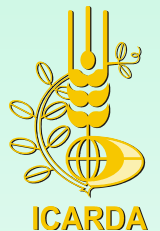


# Drought tolerant chickpea variety survived 2007 drought in Turkey



Gokce is used on about 80% of the chickpea production areas (over 550,000 ha). With a yield advantage of 300 kg/ha over other varieties, and world prices over USD 1000/t, this represents an additional USD 165 million for Turkish farmers, in 2007 alone.

The Kabuli chickpea, 'Gokce', developed by Turkish national scientists and ICARDA scientists, has withstood severe drought in Turkey and produced when most other crops failed in 2007.



ICARDA

# Conservation Agriculture



## Major Practice Worldwide

- minimum soil disturbance/zero tillage
- stubble retention
- many rotations (legumes, oilseeds)

## Benefits

- savings in time, fuel, machinery wear
- better soil structure
- better soil moisture conservation
- improved traffic ability – timely sowing
- higher yield potential
- less soil erosion



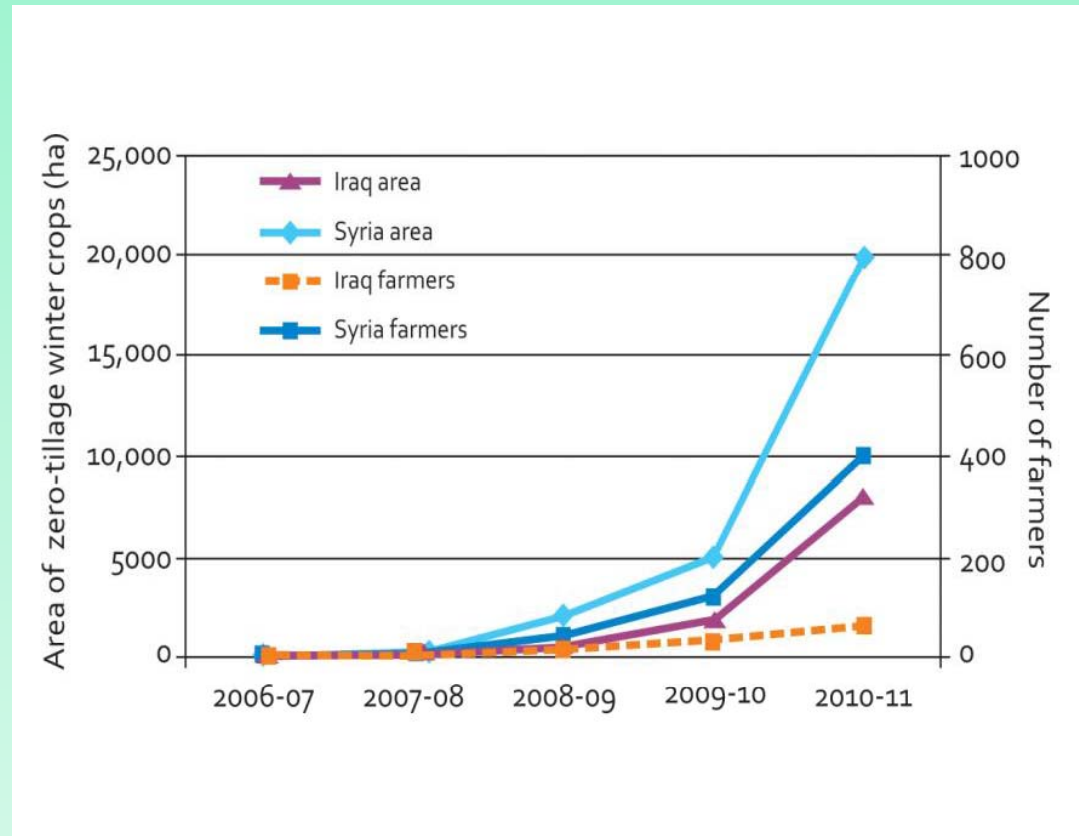
# Expansion of Conservation Agriculture in West Asia (WA)

## Adoption of Conservation Agriculture in WA:

- CA is spreading rapidly in West Asia.
- Adoption has grown from near-zero to more than 27,000 ha in four years

## Driving Forces for Adoption

- Soil-moisture conservation, thus improving WUE & reducing the likelihood of crop failure
- Cost savings (fuel, labor, seeds)



AusAID/ACIAR supported project on conservation agriculture in Iraq and Syria

# Non- Conventional Sources of Feeds to Mitigate the Effects of Drought

- Feed blocks using by-products of agro-industry
- Spineless cactus as feed crop



# Land & Water Management

- Water harvesting technologies
- Micro-catchments & mechanized contour laser planting



# Capacity Development of Human Resources

Type of Training	1978-2010
Post-graduate (MSc + PhD)	651
Individual Non-degree	2,091
Internship Group Courses	105
14,150	
<b>Total</b>	<b>16,997</b>



# Training & Capacity Building- Lebanon 1977-2010

Headquarters training courses				Non- HQ courses		Total
Long-term courses	Short-term courses	Individual Non-degree	Individual degree Ph.D/M.Sc.	In-country courses	Regional/ Sub regional	
6	145	65	18	228	74	536



# On-going projects implemented in Lebanon

Project Name	Partners in Lebanon	Duration	Countries involved	Donor
Water & Livelihood Initiative,	LARI AUB/FAFS	2009-2014	Egypt, Iraq, Jordan, Lebanon, Palestine, Syria, Yemen.	USAID
Improved water management for sustainable mountain Agriculture	LARI Green Plan	2010-2014	Jordan Lebanon Morocco	IFAD
Community-based interventions: use of grey water in home farming	LARI	2009-2011	Jordan Lebanon Palestine	Coca Cola Foundation

# On-going projects implemented in Lebanon

Project Name	Partners in Lebanon	Duration	Countries involved	Donor
Enhanced small-holder wheat-legume cropping systems to improve food security under changing climate in the drylands of WANA	LARI	2013-2016	Algeria, Egypt, Jordan, Lebanon, Morocco, Sudan, Tunisia, Turkey	EU IFAD
Scaling up best practices for managing Awassi dairy sheep to small scale farmers in West Asia	LARI	2011-2013	Lebanon Syria	IFAD

