



# State of Israel

## Ministry of Agriculture & Rural Development

### Agriculture in Israel

Where R&D Meets Nation Needs

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**Deputy Director General (Foreign Trade),  
Sacramento (CA)., May 25, 2017**





# Basic Facts about Israel

**Population: 8,309,400**

**Area: 22,000 km<sup>2</sup>**

**GDP Agriculture  
12.6 Billion NIS - 1.4%**

**Employment in Agriculture  
about 40,000 - 1.2%**

**Agro-food Exports  
2.4 Billion NIS - 3.7%**

**Agro-food Import  
5.3 Billion NIS - 7.3%**



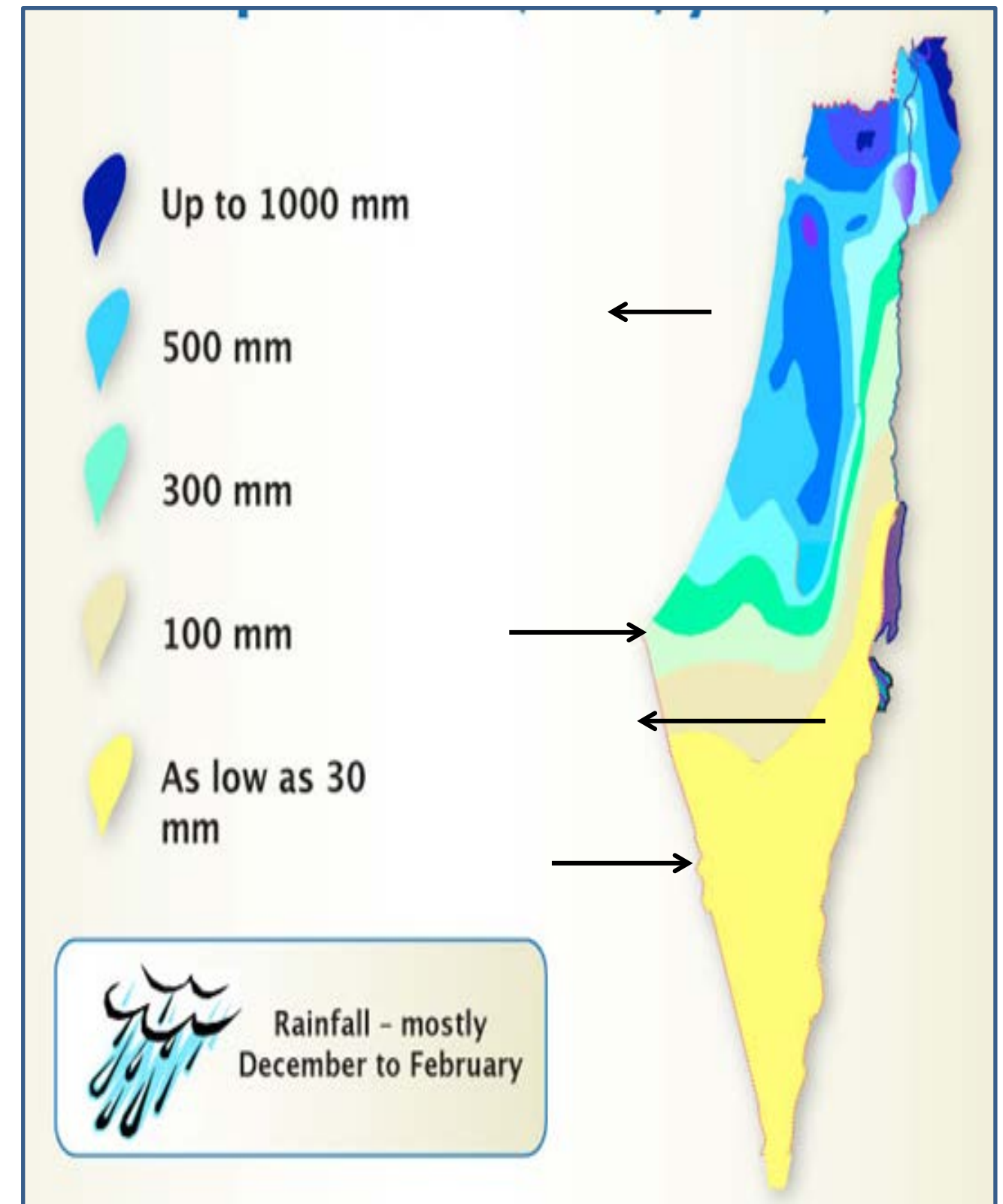




# Main constraints on Israeli Ag. sector

Israel's small land area is divided into 4 distinct climate zones

- Shortage of natural water resources
- Scarcity of precipitation
- Two thirds of Israel area is defined as semi-arid or arid
- Shortage of "On farm labor"
- Complex geopolitical environment
- Distance from the export & import markets





# Additional constraints Support of Agriculture in Israel



Low level of support for farmers,  
Compared to other developed countries



Decline of support levels over time



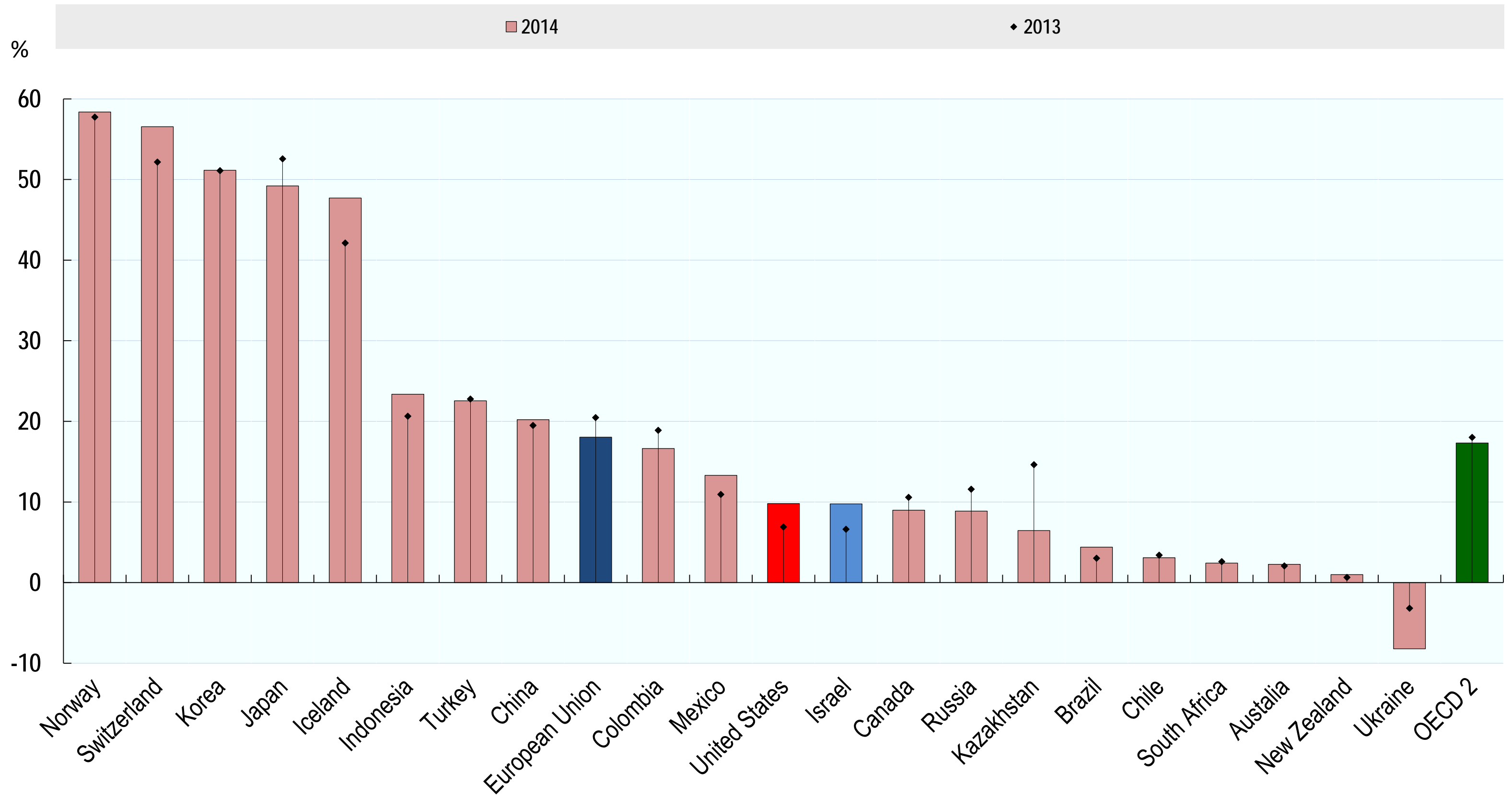
Mainly, distortive market price support measures



# Producer Support Estimates by Country



(% of gross farm receipts)





*But ...*





# Israeli Agriculture R&D and Investment

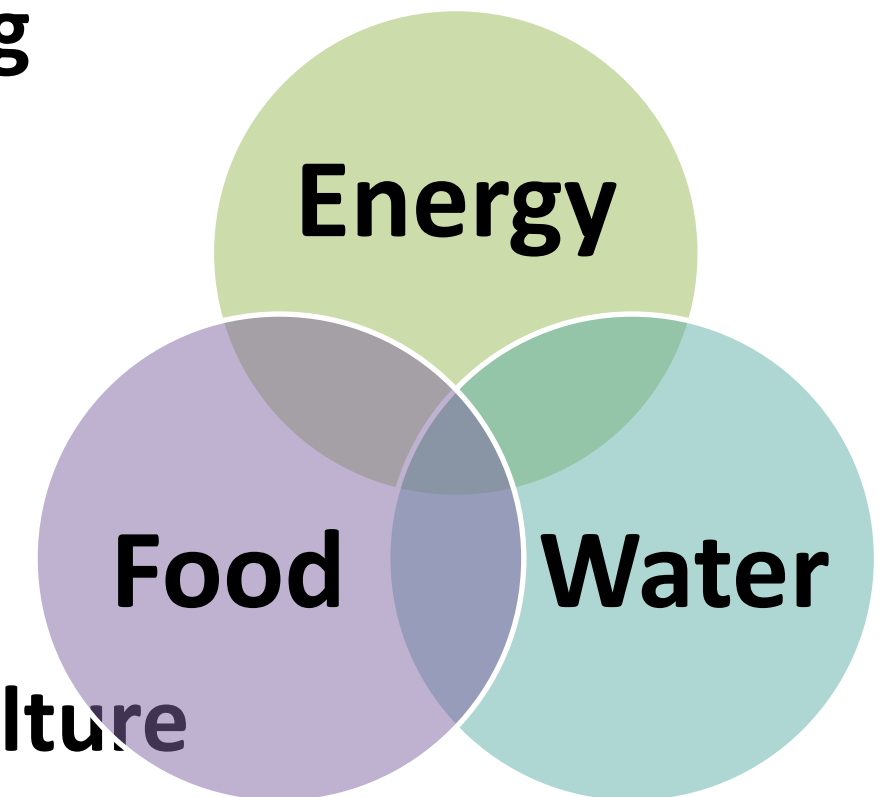
## (From OECD report on the Israeli Agriculture)

- 💧 The Agriculture sector has benefited from high levels of investment in research and development, well developed education systems and high performing extension services
- 💧 Israel is a world leader in many aspects of agricultural technology, particularly those associated with farming in arid conditions
- 💧 Agriculture relies not so much on a “natural” comparative advantage in farming, but on an “induced” comparative advantage built on technological progress and innovation
- 💧 **Israel has implemented an advanced water pricing policy and has encouraged innovation in water-related technologies**



# Solutions: Israel as a Global Agro-Tech Center

- 🚰 **Global leader in Agro-Technologies (especially arid areas) and water systems**
- 🚰 **Multidisciplinary R&D with proven abilities in developing Agriculture know-how**
- 🚰 **Among highest ranking in Agriculture yields**
- 🚰 **A global leader in high-tech and information & communication technologies (ICT) for tomorrow's agriculture**
- 🚰 **Israel agriculture is a worldwide "beta site"**
- 🚰 **Knowledge and experience in introducing, together with mega-companies, new products and technologies into agricultural practice all over the world**

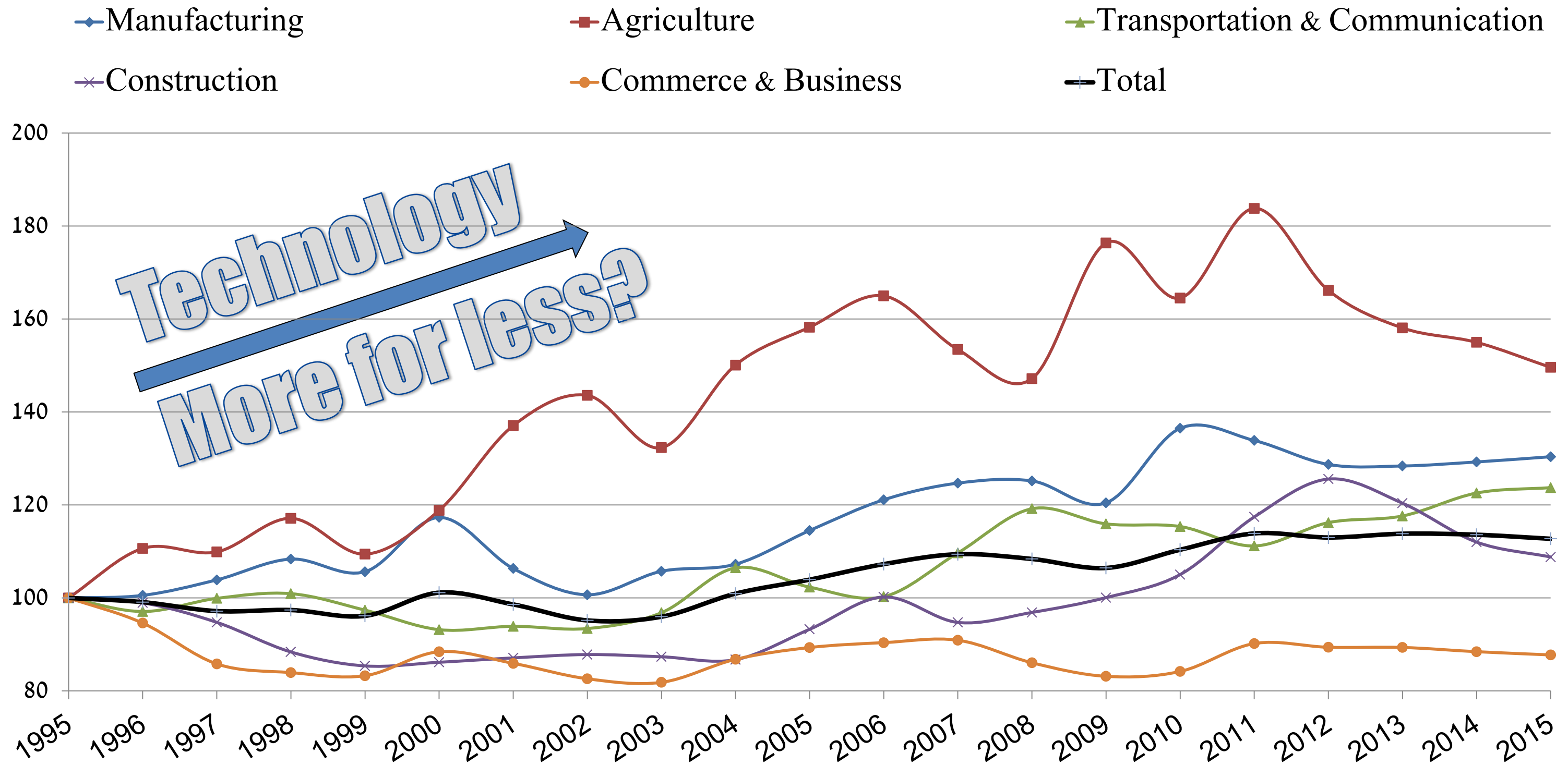


**Combining these will place Israel as a Global Agri-Tech center**





# Evolution of Productivity In Agriculture & other sectors

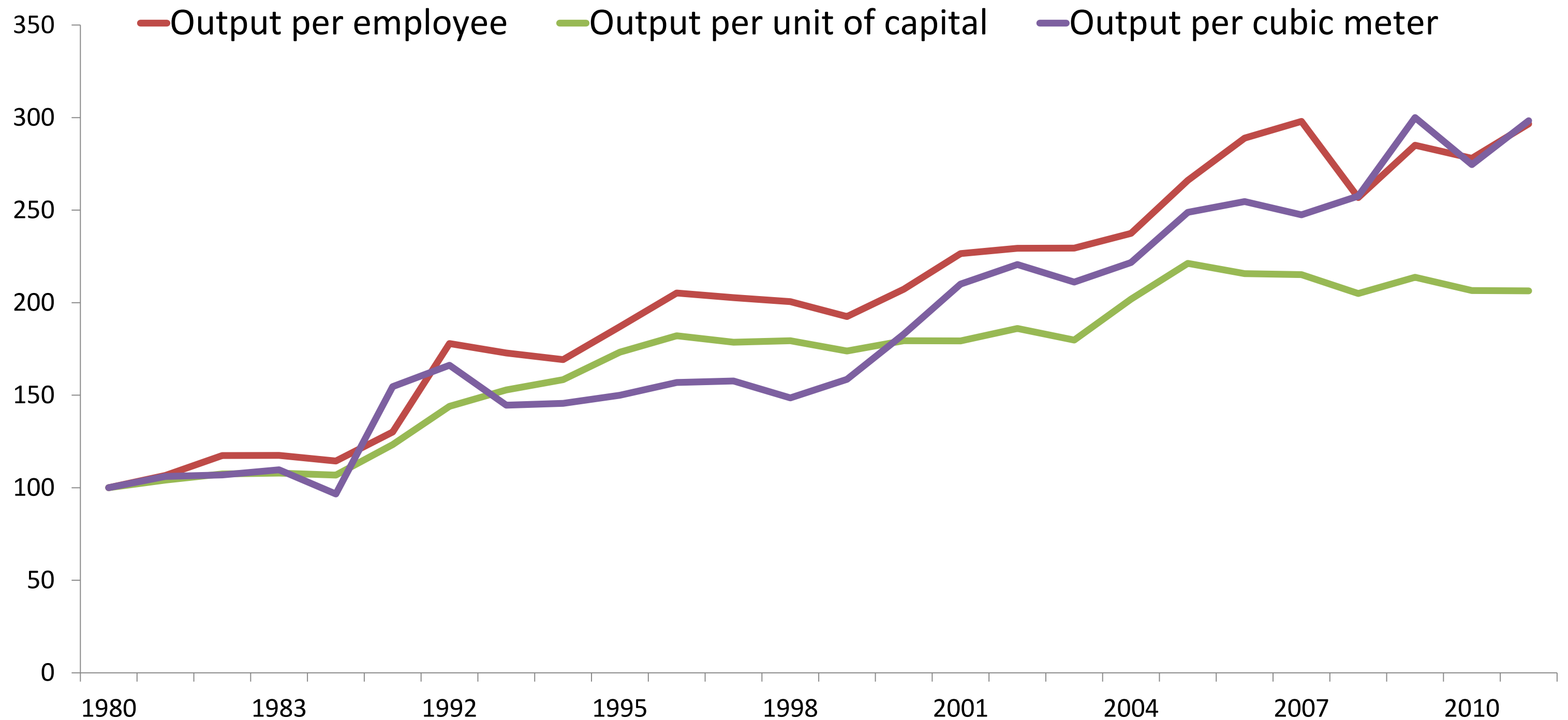




# Increasing Productivity and Efficiency

## Partial Productivity Indices

(Labor, Capita, Water, 1980 = 100)



# Key for Success

- ❖ Close cooperation and interaction
- ❖ Promotions of advanced technologies in all agricultural sectors.







# Irrigation and Water Resources Management Technologies in Israel





# The global Water Challenge

**Is the world going into a Water crisis?**

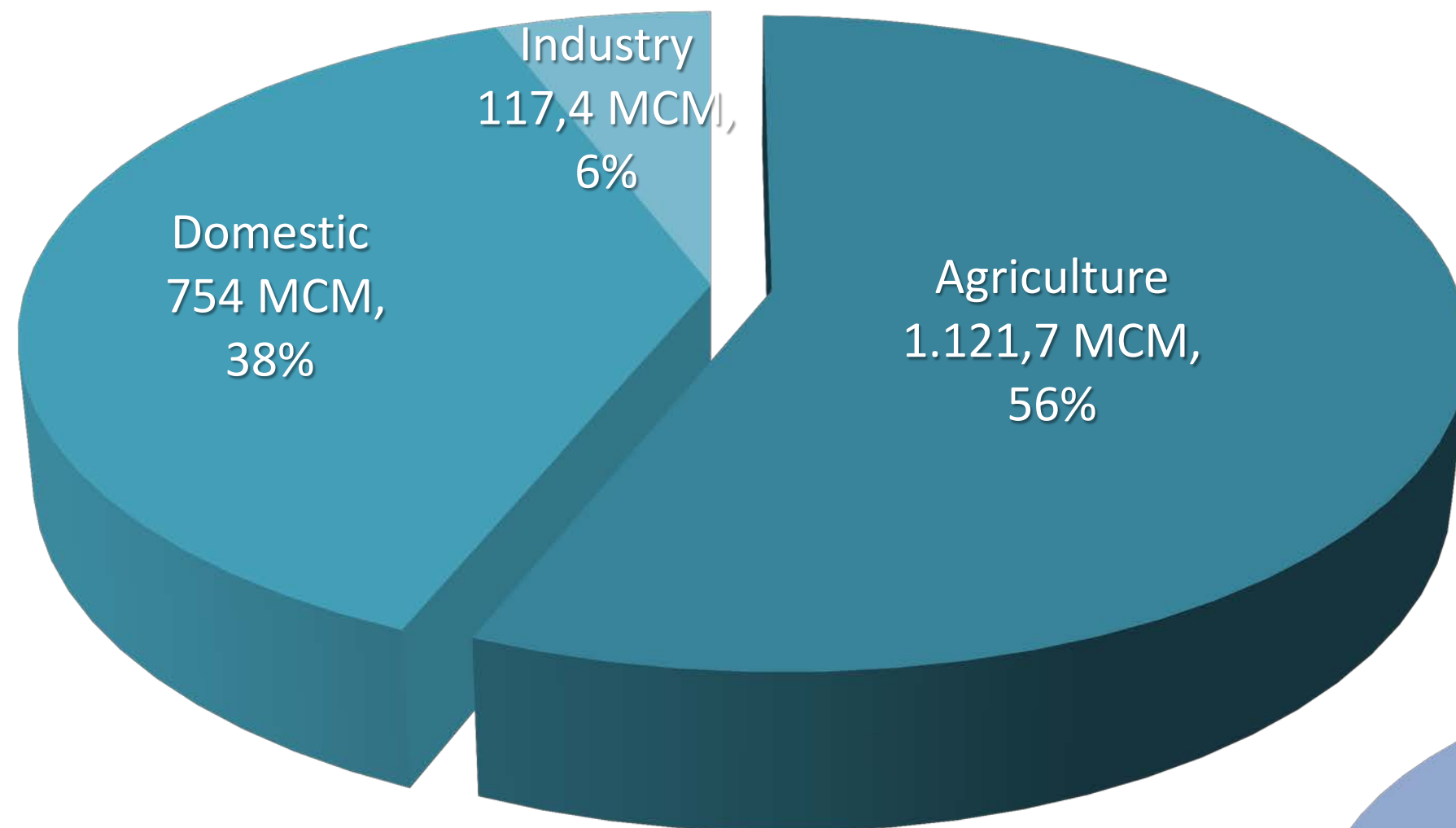
**The US government predicts that By 2025**

**60%**

**Of the world's landmass and 40 of 50 US states  
will experience Water Shortages**

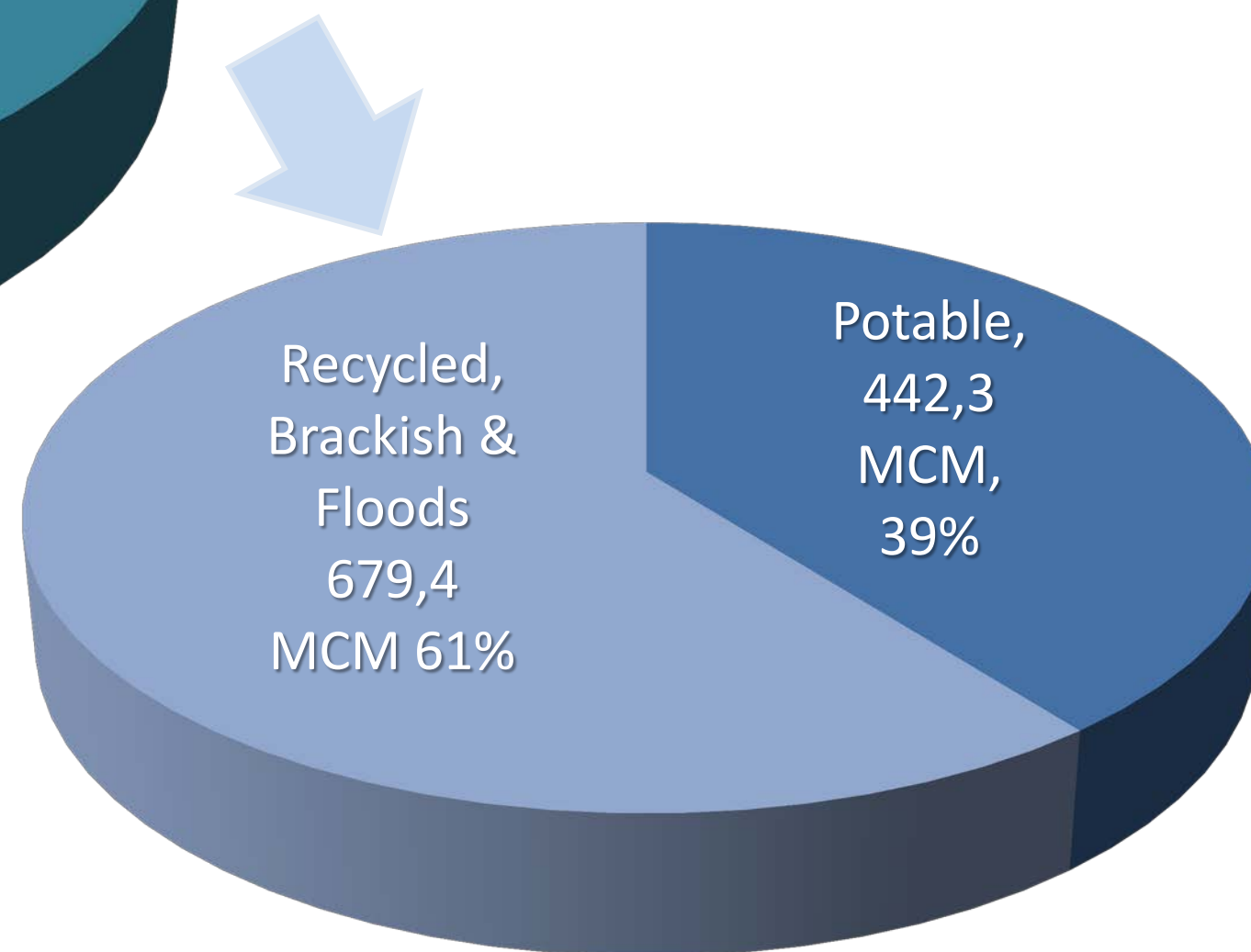


# Water Consumption in Israel



**Total: 2.114,1 MCM**  
(including 29,6 MCM for Nature)

Supply to PA – 66.1 MCM  
Supply to Jordan – 54.9 MCM







# Water Resources & Water Demand

- 💧 Average total natural enrichment – **1,170 Billion m<sup>3</sup>/year!!**
- 💧 Overall water demand – **2,2 Billion m<sup>3</sup>/year, of which:**
- 💧 Current potable water demand ~ 1.2 Billion m<sup>3</sup>/year
- 💧 **Actual Deficit - 1.0 Billion m<sup>3</sup>/year**
- 💧 Forecast for potable water demand:
  - 💧 2020 ~ 1,7 Billion m<sup>3</sup>/year
  - 💧 2030 ~ 1,95 Billion m<sup>3</sup>/year
  - 💧 2040 ~ 2,2 Billion m<sup>3</sup>/year
  - 💧 2050 ~ 2,45 Billion m<sup>3</sup>/year



# R&D – Potential Expansion of Water Resources

## Irrigation technologies, Purification and Recycling, Desalination

- 💧 **Marginal water– saline and brackish water**
- 💧 **Waste water treatment technologies and recycling**
- 💧 **Desalination Technologies**
- 💧 **Water saving: improving irrigation practices, precision agriculture, preventing leaks, drip irrigation, public education**

Water Treatment & Recycling



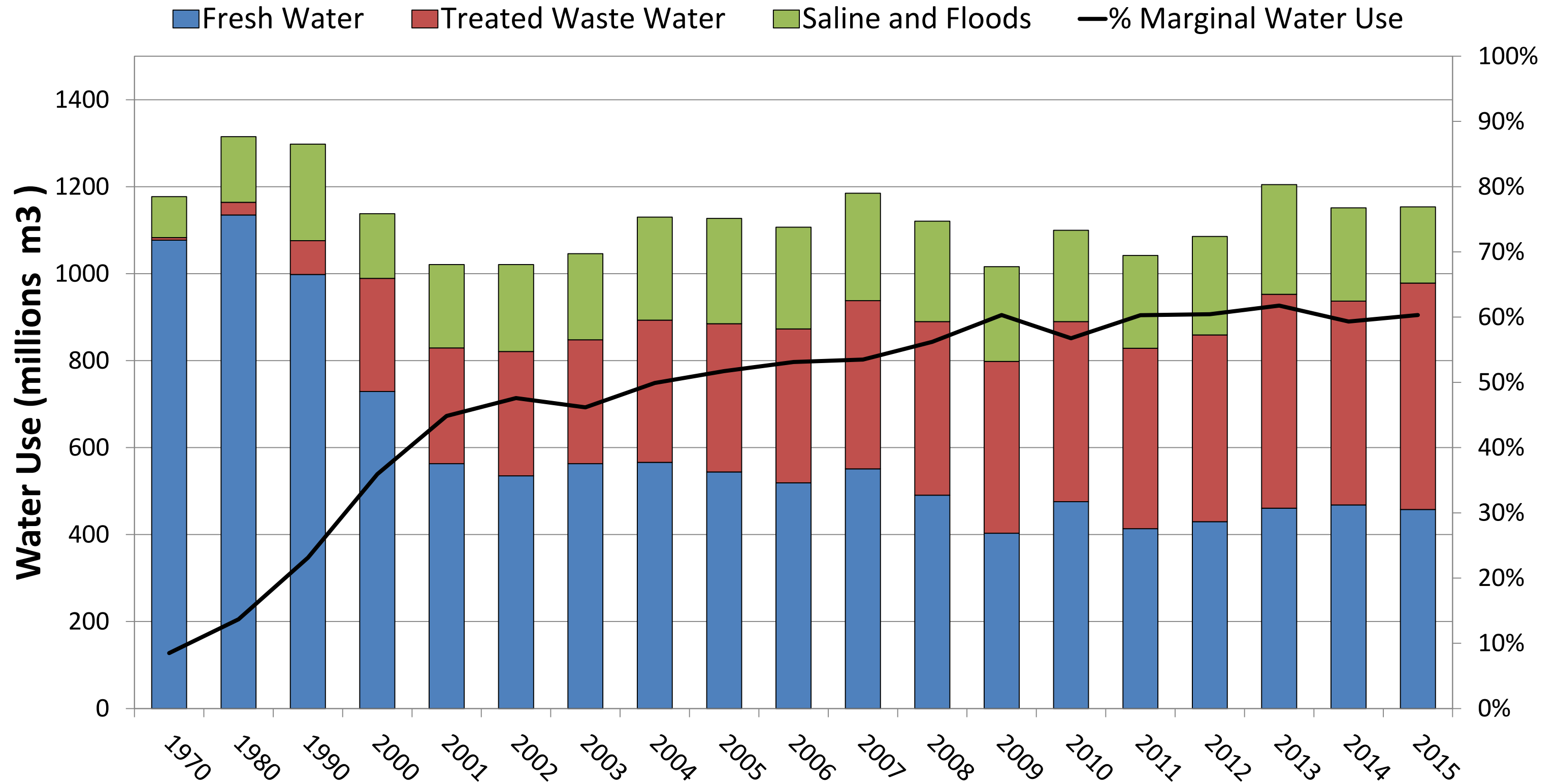
Drip Irrigation





# Water for Agriculture

(1970-2015)







# Agriculture Irrigation Water

- Israel produces 530MCM of treated water every year
- More than 80% of the water is used for irrigation
- Placing Israel 1st in the world in water recycling

**Education!**  
The key for sustainability future

Israel	Spain	Australia	Italy	Greece	Europe/USA
87%	17%	15%	8%	5%	5%

R&D - The effect of micro-pollutants in recycled water on human health and the environment  
The environmental impact of surfactants, pharmaceuticals, hormones and cosmetics





# Water Technologies



## Sector Highlights

- 💧 **Israeli systems account for 50% of the world's low-pressure irrigation systems, reducing agricultural water consumption by 30%**
- 💧 **Israeli companies have installed more than 350 desalination plants in nearly 40 countries**
- 💧 **Among world's lowest-cost producers of desalinated water: ~ \$0.55/m<sup>3</sup> vs \$1.00/m<sup>3</sup> world average**
- 💧 **Global opportunity – only 12% of the world irrigation is through drip irrigation**

Water Management

Water Desalination

Irrigation

Urban Water  
Solutions



# Other selected aspects of High-tech in Israeli Ag. sector







# Precision Agriculture

## Thermal imaging for water status mapping

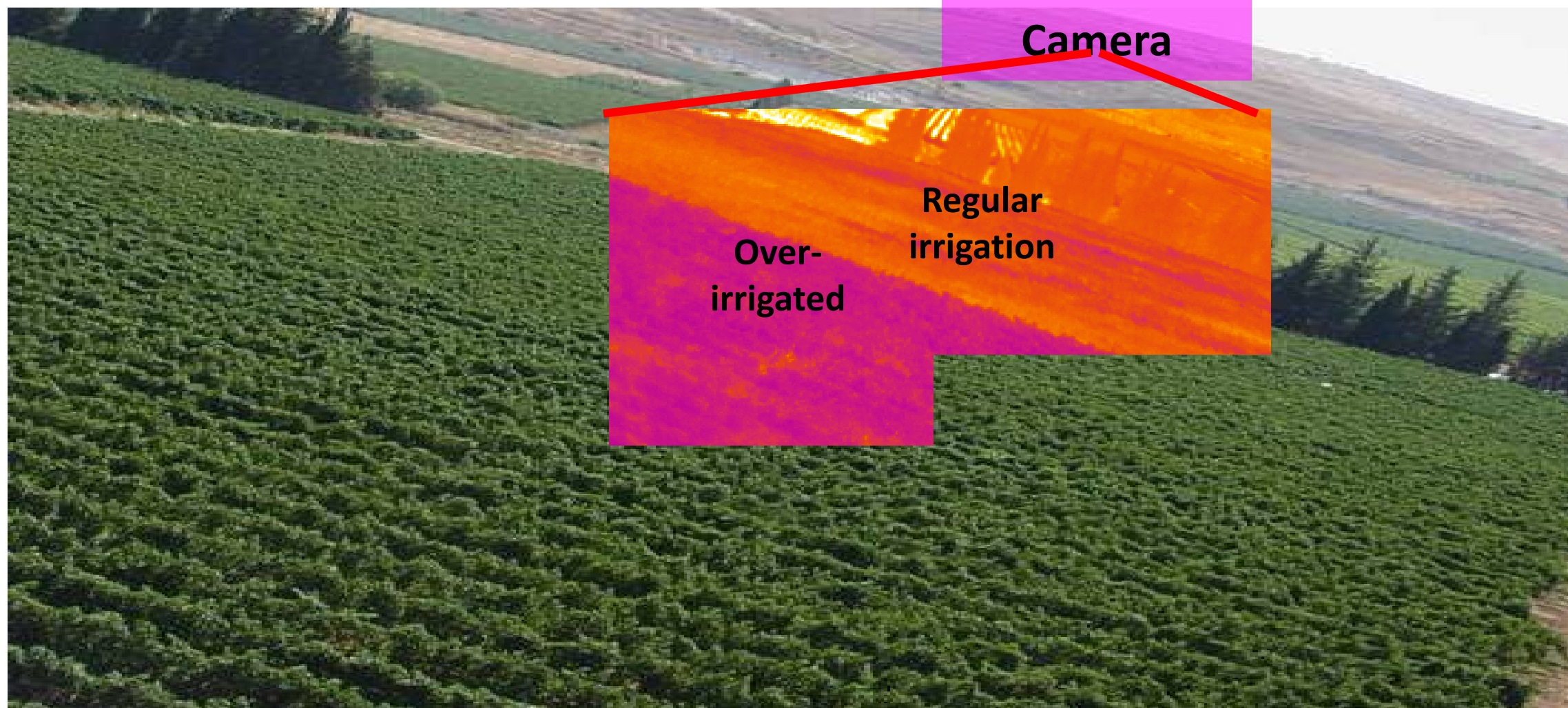
Thermal imaging exposes differences in water status of plants which cannot be detected by our eyes



Regular Camera



Thermal Camera



Over-irrigated

Regular irrigation



20 meters crane above a vineyard



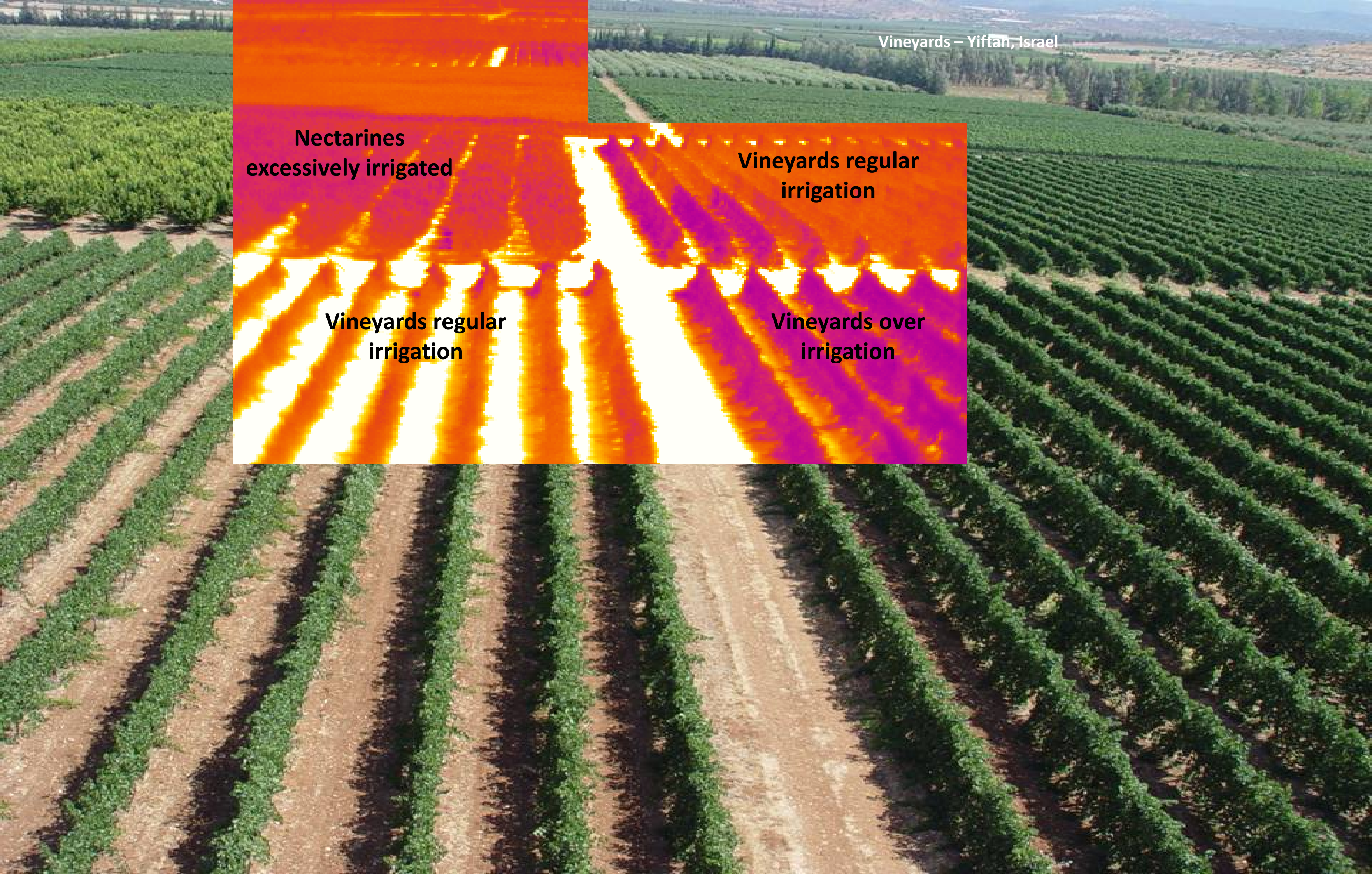
Vineyards – Yiftah, Israel

**Nectarines  
excessively irrigated**

**Vineyards regular  
irrigation**

**Vineyards regular  
irrigation**

**Vineyards over  
irrigation**





# Innovation / Sophistication in Postharvest Practices in Israel



**New technology**



**New storage technology**



**Sophisticated produce**



**NO MORE FOOD  
TO WASTE**  
16 - 19 JUNE  
**2015**  
GLOBAL ACTION TO STOP FOOD LOSSES AND FOOD WASTE

**FAO estimates that each year approximately  
**one-third** of all food produced for human  
consumption in the world is either lost or wasted**





## Postharvest Technologies

- ❖ Prolonged storage and extended shelf life
- ❖ Modified atmosphere packaging (biodegradable materials)
- ❖ Environment-friendly technologies (non-chemical): hot water rinsing and brushing
- ❖ Biocontrol agents against pathogens
- ❖ Long vase life of ornamentals





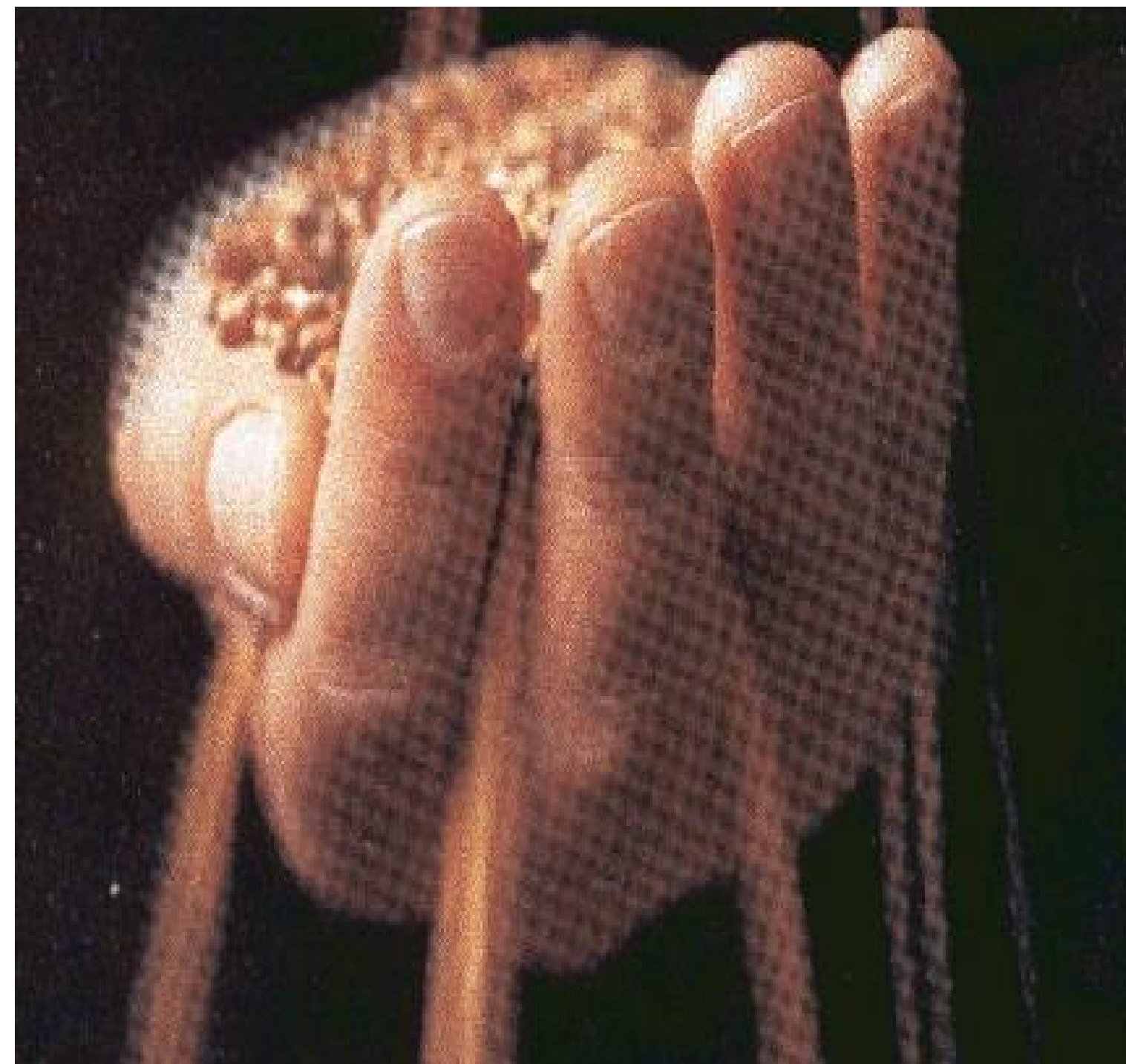


# Grain Storage Aim

**To prevent quantity and quality loss of stored grain**

**As a result of efficient monitoring, intensive R&D of innovative methodologies and technologies, grain losses in Israel do not reach levels higher than 0.5%.**

**Such levels are regarded as a notable international achievement**







# Israeli Dairy Farming







# Facts about the Israeli Dairy Herd

- ❖ **124,000 dairy cows**
- ❖ **90% are herd book registered (monthly recorded)**
- ❖ **Breed: Israeli Holstein; 100% AI**
- ❖ **100% mechanically milked; Milk equipment is mostly locally made (SAE Afikim; SCR)**
- ❖ **2 types of farms:**
  - **Big farms, 300-900 cows, (Kibbutz farms); 3X**
  - **Smaller family farms, 40-200 cows (Moshav farms); 2-3X**
- ❖ **Annual production: 12,000 liter/cow.**
- ❖ **3,75% Fat**
- ❖ **3,37% Protein**





# Key factors for the success of the Israeli Dairy sector



**Genetics**

**Management**

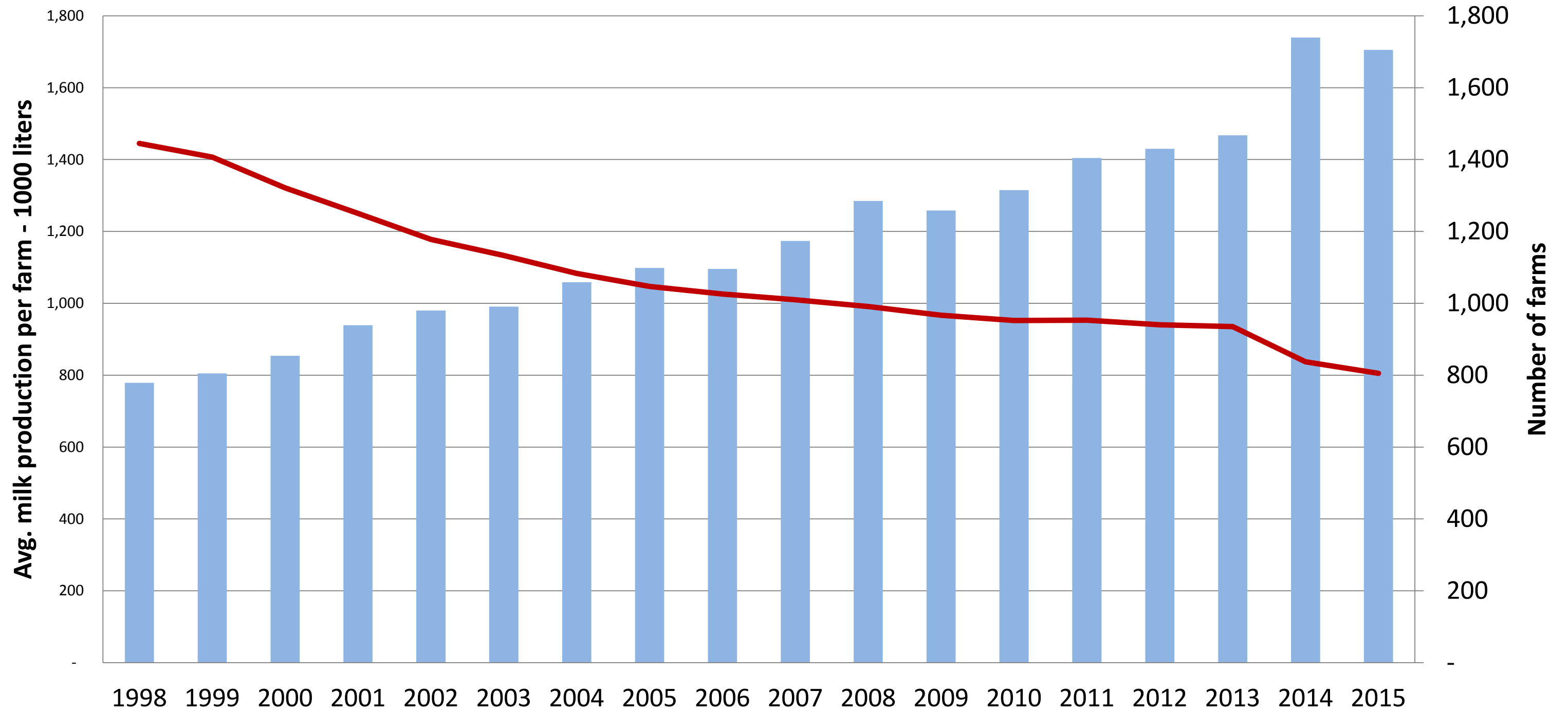
**Nutrition**





# Number of dairy farms and production per farm

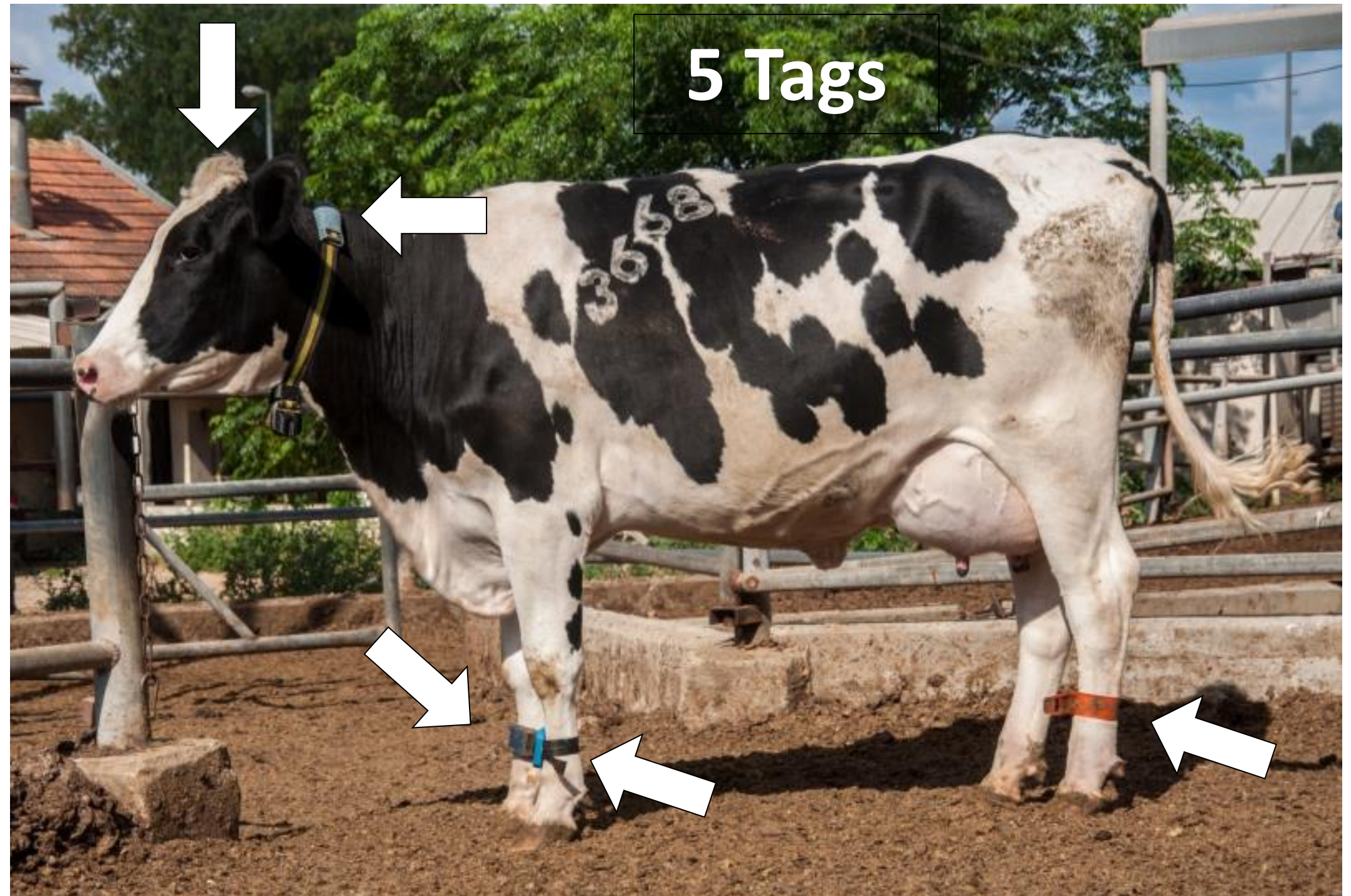
Average per farm Farms





# The Israeli “High-tech” cow

- ❖ Milk yields
- ❖ Fat, protein and lactose percentages
- ❖ Body weight
- ❖ Feed intake
- ❖ Activity
- ❖ Lying time
- ❖ Rumination time







# Feeding centers





# Advantages of the Feeding centers

- ❖ Few and efficient machinery.
- ❖ Cooperation between centers.
- ❖ Extensive use of byproducts and others additives.
- ❖ Computation and exact control.
- ❖ Size advantages while buying foodstuff.
- ❖ High variety of energy and protein sources.
- ❖ Different treatments of whole grains.
- ❖ Long range storage (cottonseeds, silage, hay).
- ❖ TMR
- ❖ Low depreciation and waste (proper storage equipment).
- ❖ Distance between stores to avoid fire.





# Fishery



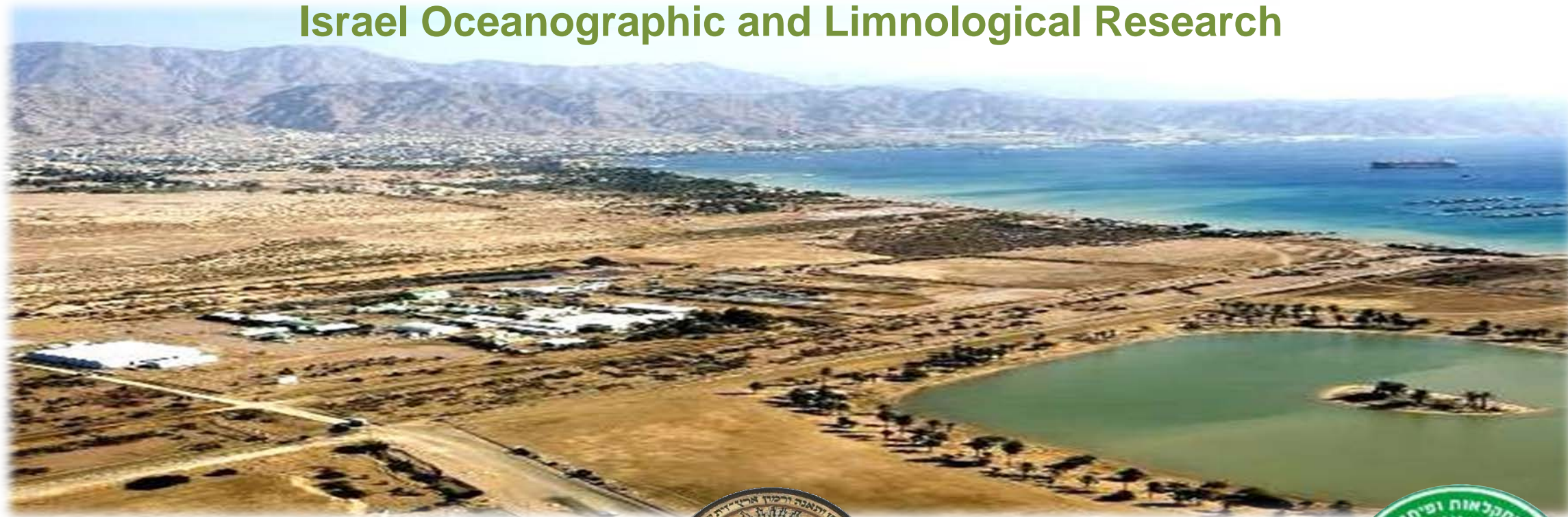
20 meters crane  
above a vineyard





# Current Challenges and Future Perspectives in Mariculture Research

Dr. Hanna Rosenfeld  
National Center for Mariculture  
Israel Oceanographic and Limnological Research



מכון המחקר הלאומי למריקולטורה  
National Center for Mariculture







# The National Center for Mari culture (NCM), Eilat

## Mandate:

To develop a branch of agriculture that utilizes seawater & brackish water for culture of high quality marine organisms & establish an associated biotechnology

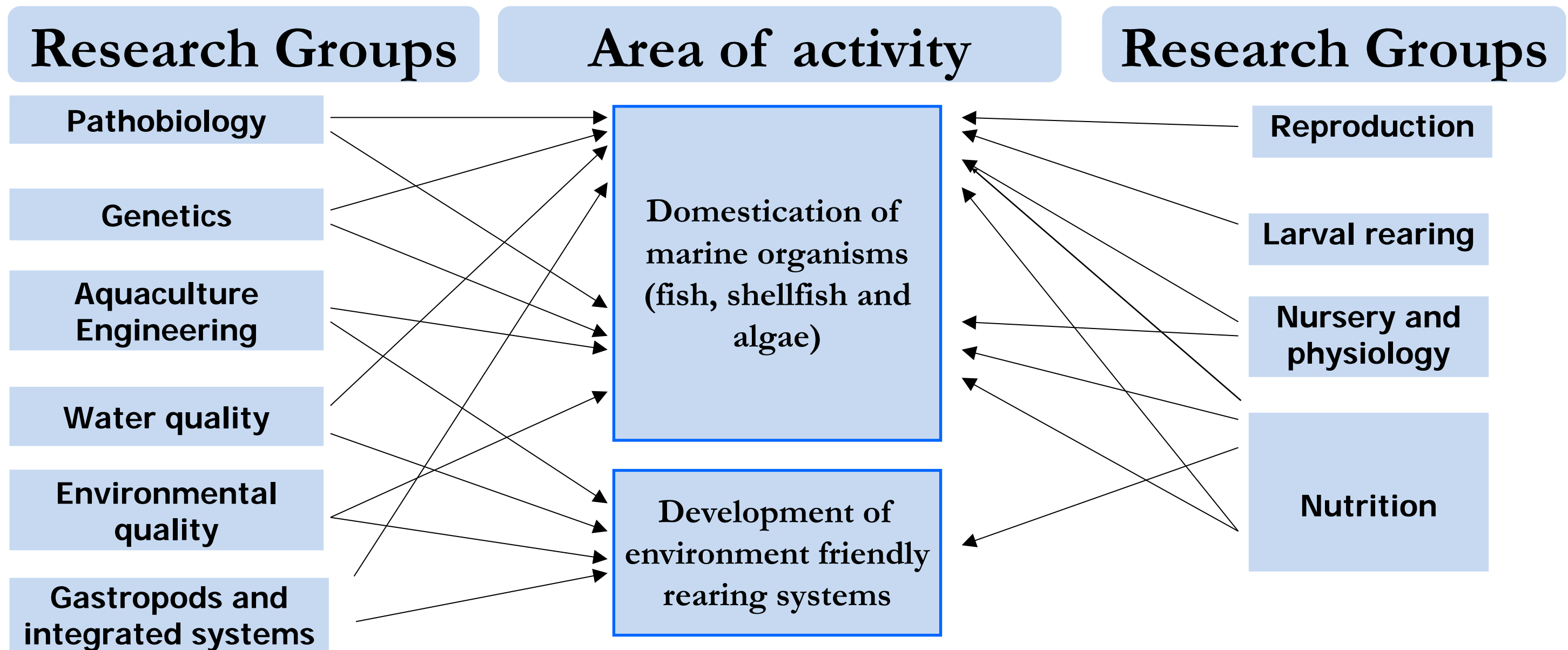






# The National Center for Mariculture (NCM), Eilat

## Mode of activity





# Mari culture R&D



## Mari culture production

**Off-shore cage farming**  
12 km offshore, 12m wave height



## Domestication of high value species

White grouper



Blue fin Tuna



Mullet (Mugil Cepalus)







# Extensive & Intensive Aquaculture



Tilapia



Card



Koi



**Recirculating Aquaculture Systems (80-100 kg/m<sup>3</sup>) also for marine species**







# WATEC Israel 2017

September 12-14, 2017 Water Technology and Environment Control  
Exhibition & Conference







May 8 – 10, 2018, Tel-Aviv, Israel  
International Agro Technology Exhibition & Conference

HOME GENERAL INFORMATION EXHIBITION & SPONSORSHIP CONFERENCE & FIELD TOURS VISITOR INFORMATION REGISTRATION ARCHIVE



# Agritech 2018

The 20th International Agricultural Exhibition & Conference  
May 8 – 10, 2018, Tel-Aviv, Israel





# Agri is our Culture

## From Biblical Times to Nowadays



42





**Thank  
You**

*Mahalo*

**Kiitos**

*Tack*

**Toda**

**Grazie**

*Obrigado*

**Thanks**

**Takk**

**Merci**

**Gracias**

