Agricultural Research Organization
Volcani Center

State of Israel / Ministry of Agriculture and Rural Development

Agriculture in Israel

Where R & D meet's Nation Needs

Yoram Kapulnik May 4, 2013

ARO - since 1921

Ministry of Agriculture and & Rural Development

Israel in the Middle East

Area: 22,000 Km²

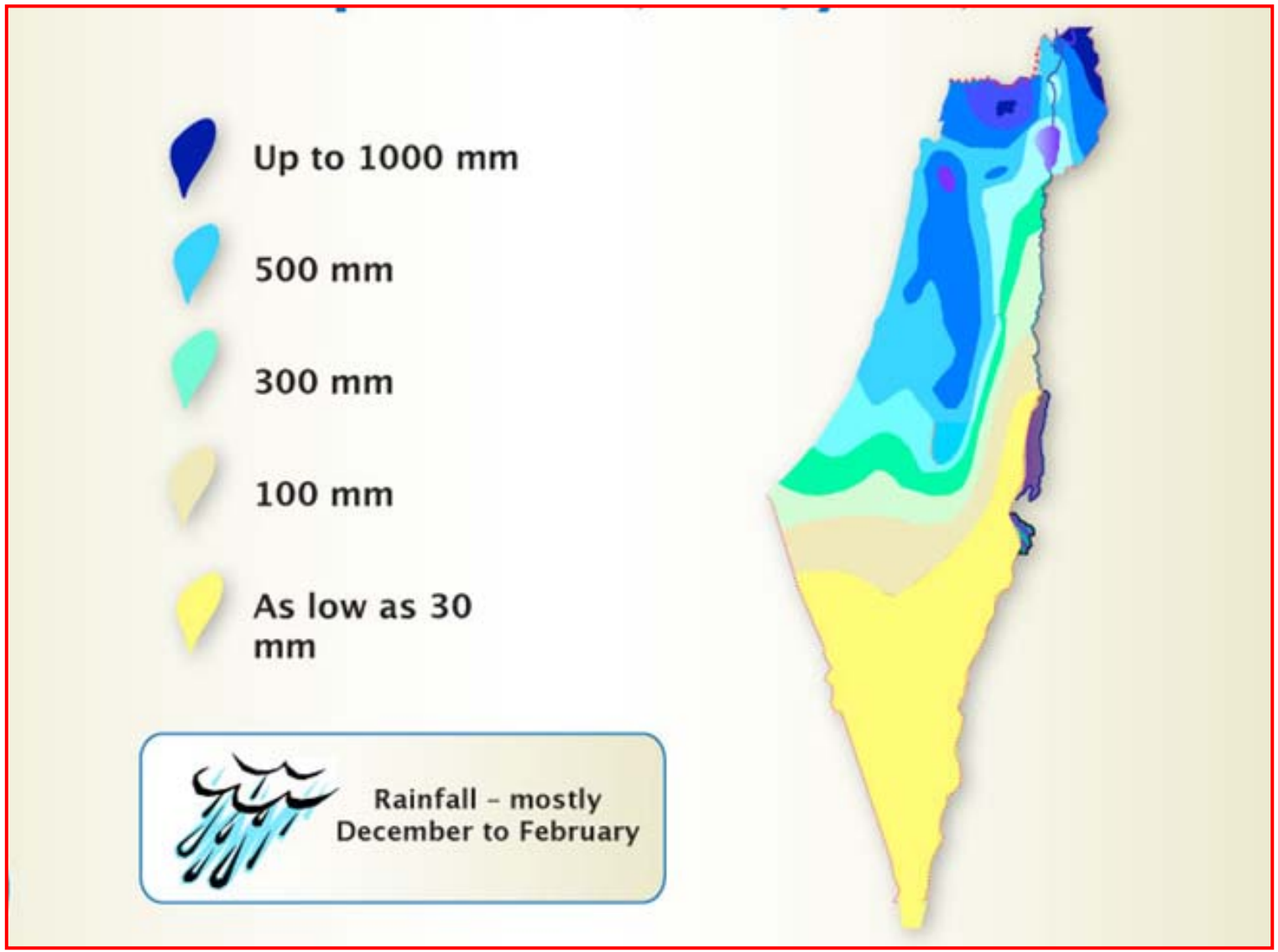
Arable land:
420,000 ha

Irrigated:
158,000 ha

Non irrigated:
134,400 ha

Pasture:
130,000 ha

Precipitation (mm/year)



Constraints of Israeli Agriculture

- Shortage of water resources

- Scarcity of precipitation
- Two thirds of the land area defined as semi-arid or arid

- Shortage in “On farm labor”
- Complex geopolitical environment
- Distance from the export markets

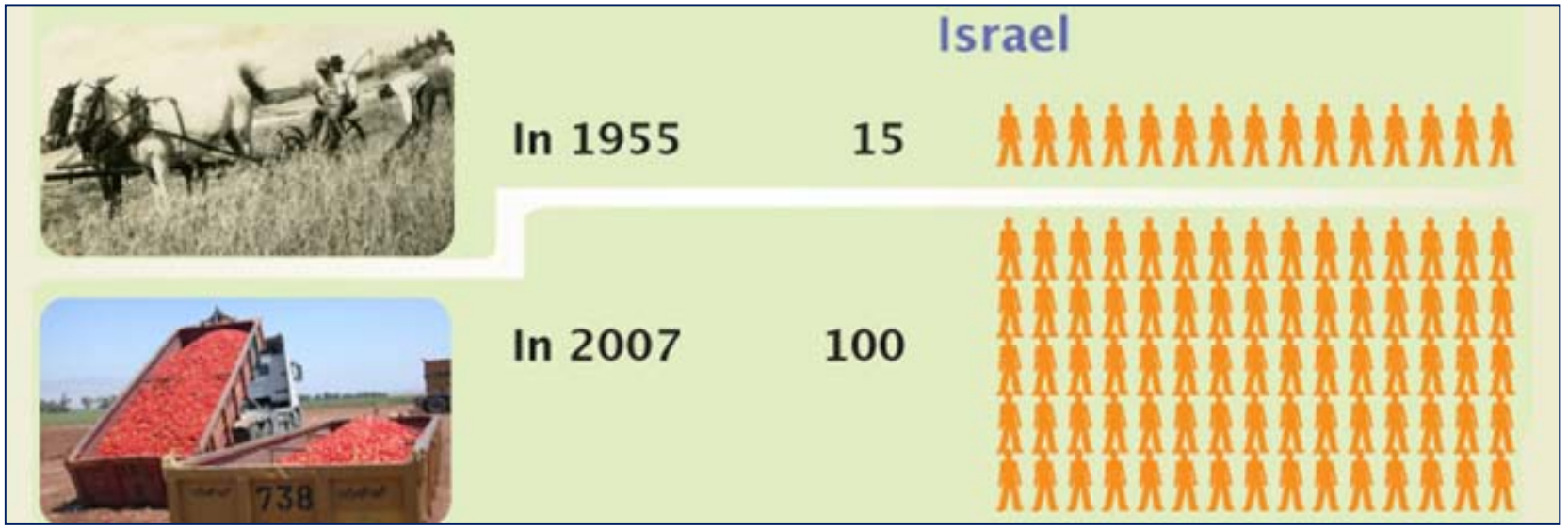
These constraints compel Israeli agriculture to:

- Ensure a high degree of self supply
- Protect domestic produce with special means
- Develop and improve intensive production technology, which meets economic profitability criteria
- Maintain peripheral areas, especially along the borders

Manage available resources

Improved efficiency

Number of people fed by one farmer

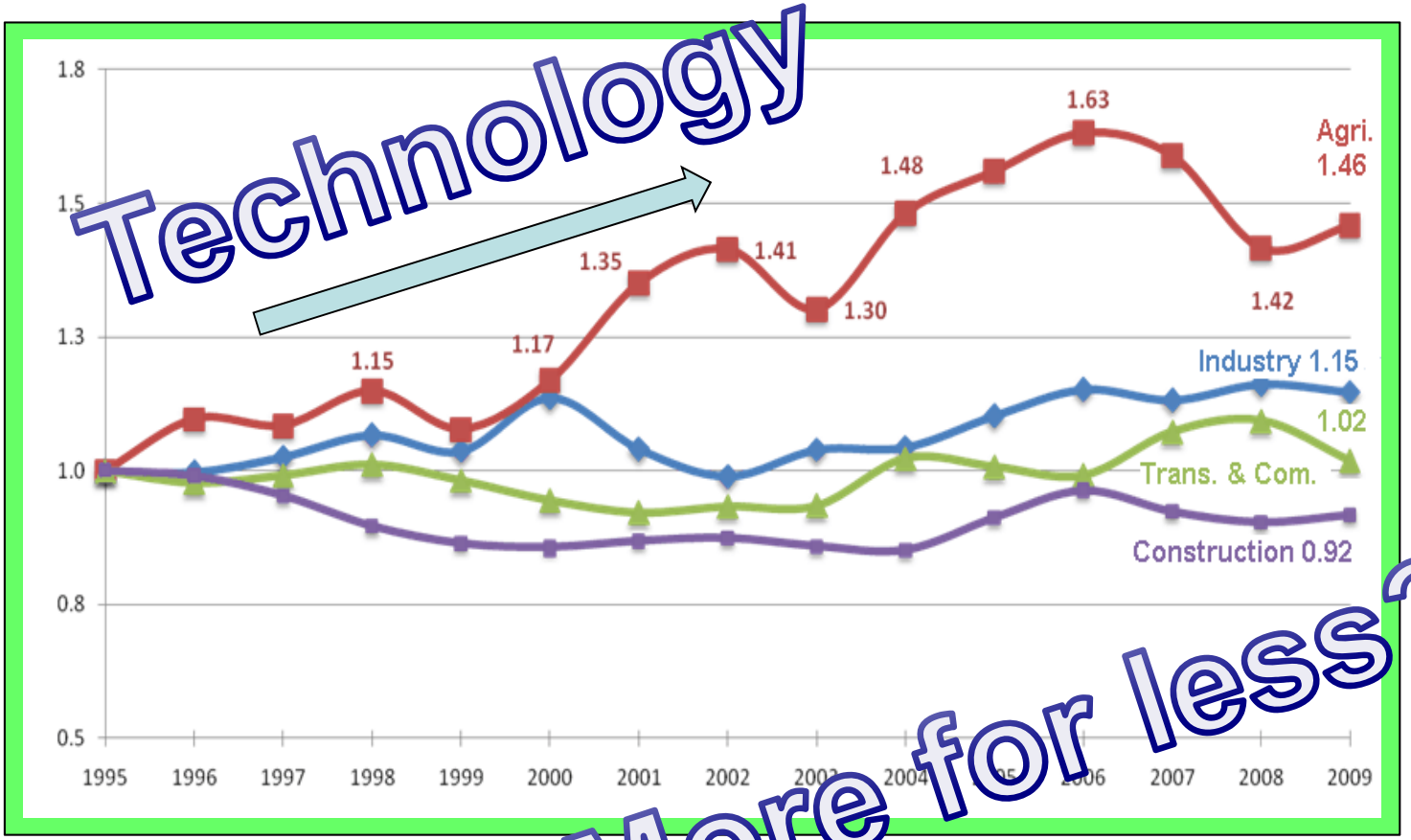


Worldwide

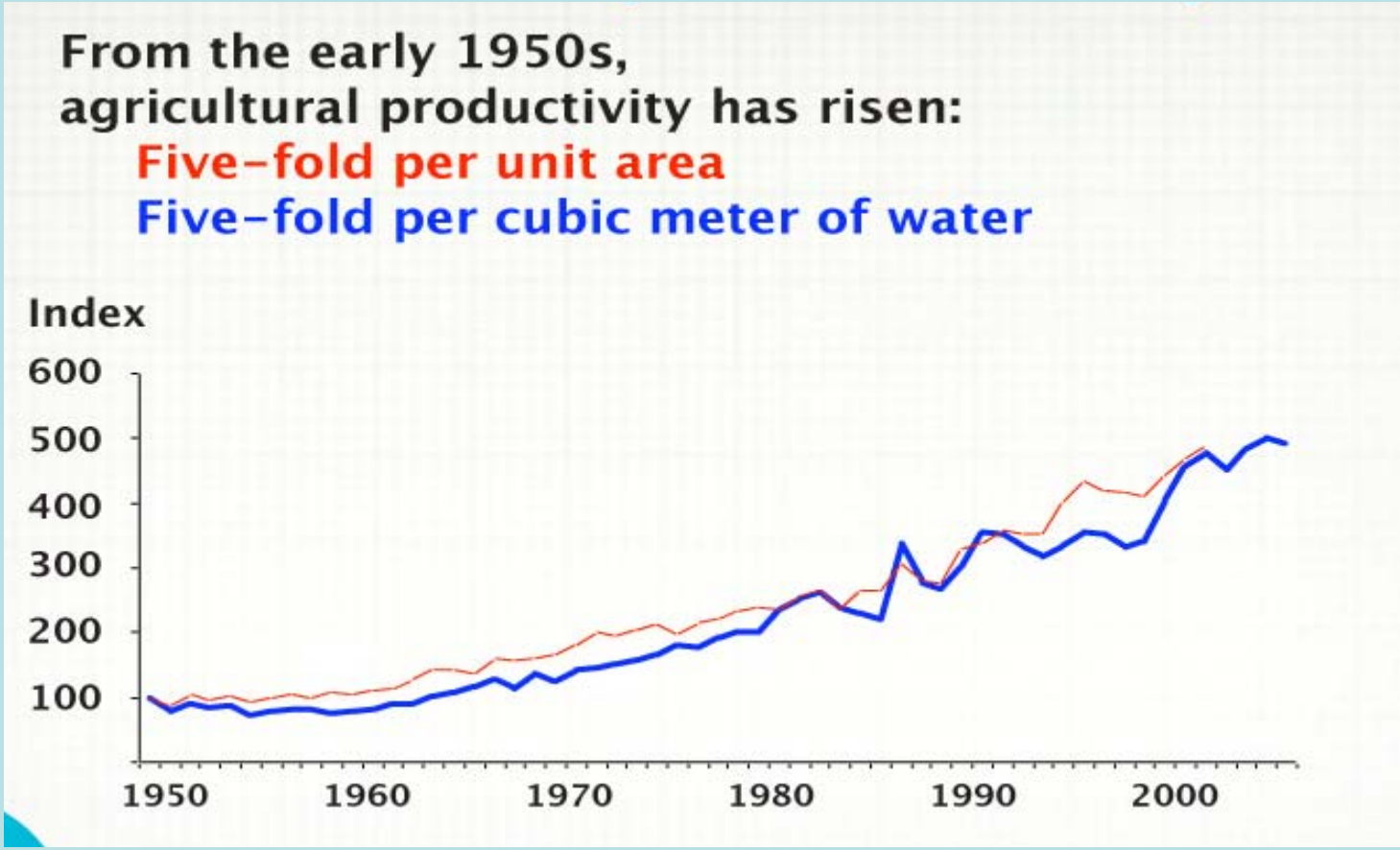
In 2007

Developing countries:	2–20
Developed countries:	90–120

Evolution of Productivity in Agriculture and Other Sectors



Productivity and efficiency



Potential irrigation water sources

- Existing potable water reservoirs (lakes, aquifers, streams)
- Marginal water (saline water, treated sewage effluents)
- Rainfall enhancement
- Desalination
- Water saving: improved irrigation practices and irrigation technology (optimal supply of plant needs, drip irrigation, leak prevention, etc.)

Ein Yahav: past and present

1959

1979

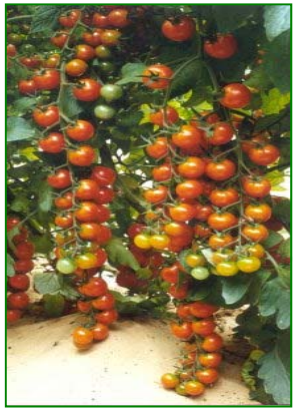
1999

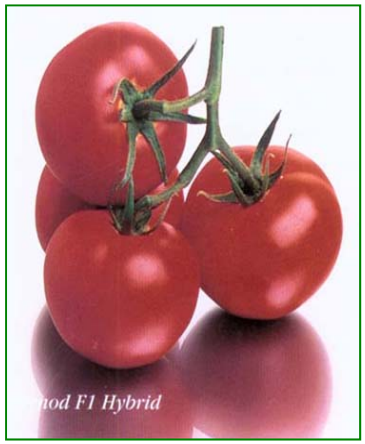
High yielding verities

Diversity of tomato varieties

Meeting marketing desires

Meeting customer goals





Yield

Shelf life

Taste, Texture, Shape

Nutritional Quality

1970 → 1980 → 1990 → 2000 →

Prevention of soil erosion

Forestation
(JNF)

General demand for future Agriculture R&D organizations

- To ensure continuous supply of fresh agricultural products for the local markets at cost-effective prices for both consumers & farmers
- To act for preservation of the open areas and build up a more ecologically effective agriculture practices

One way to go:

Technology development

Netting technology

- Protection from environmental hazards
- Water-saving
- Netting of different colors for plant growth control
- Shadowing for climate and growth control

Fresh water scarcity will be replaced by desalinization programs

Improving irrigation systems

Precision in agriculture

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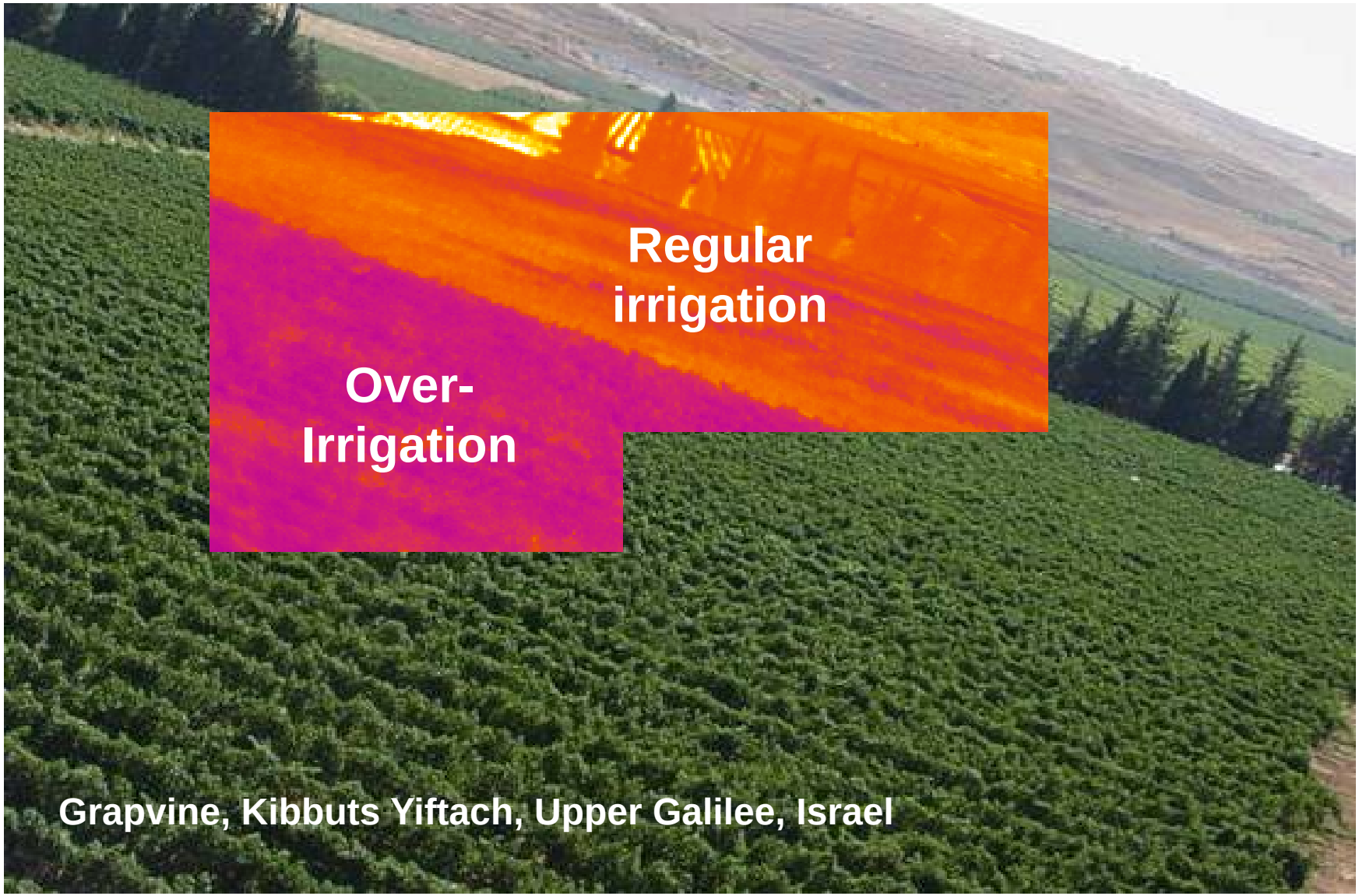
Thermal Imaging: Water status variability



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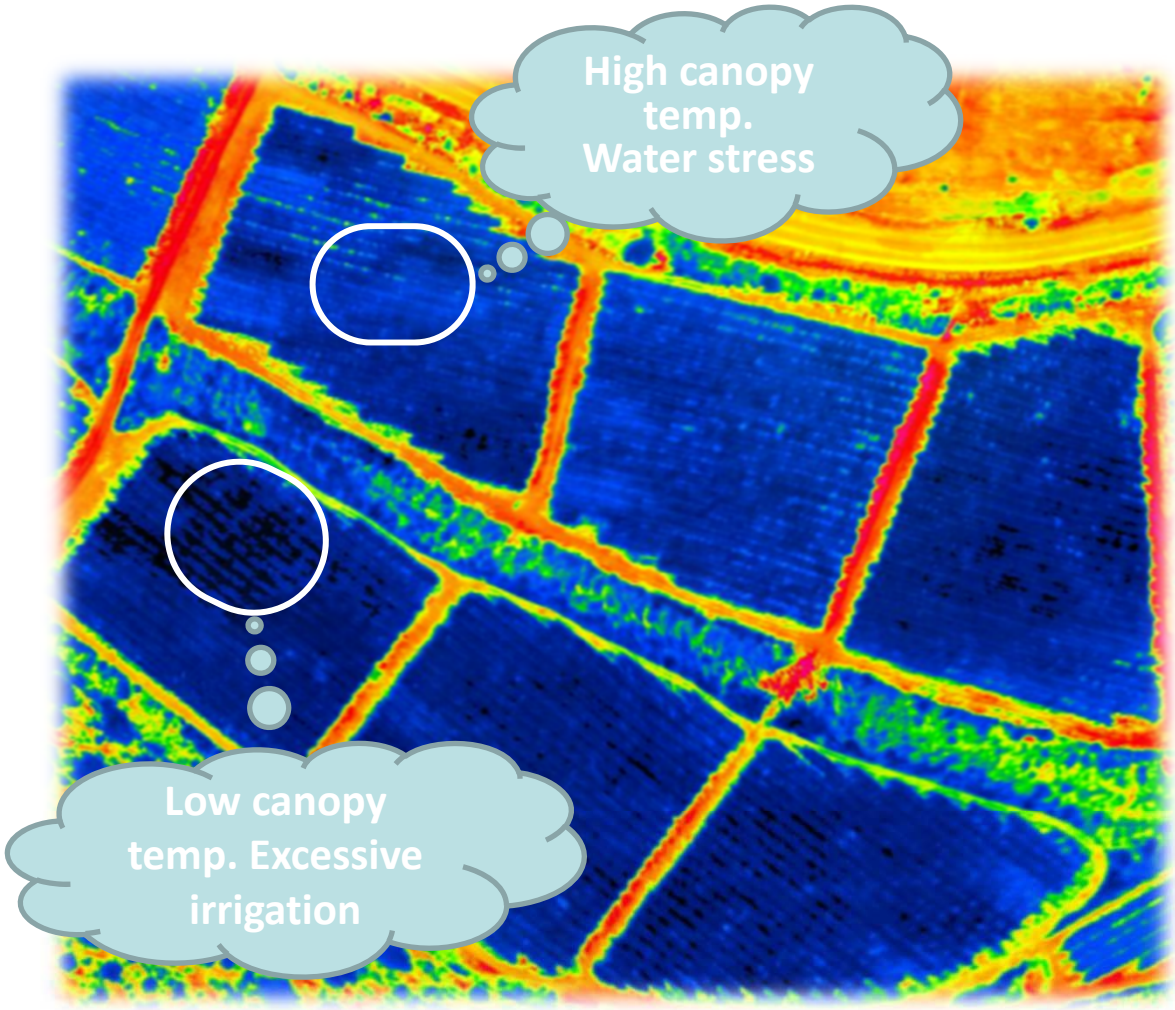
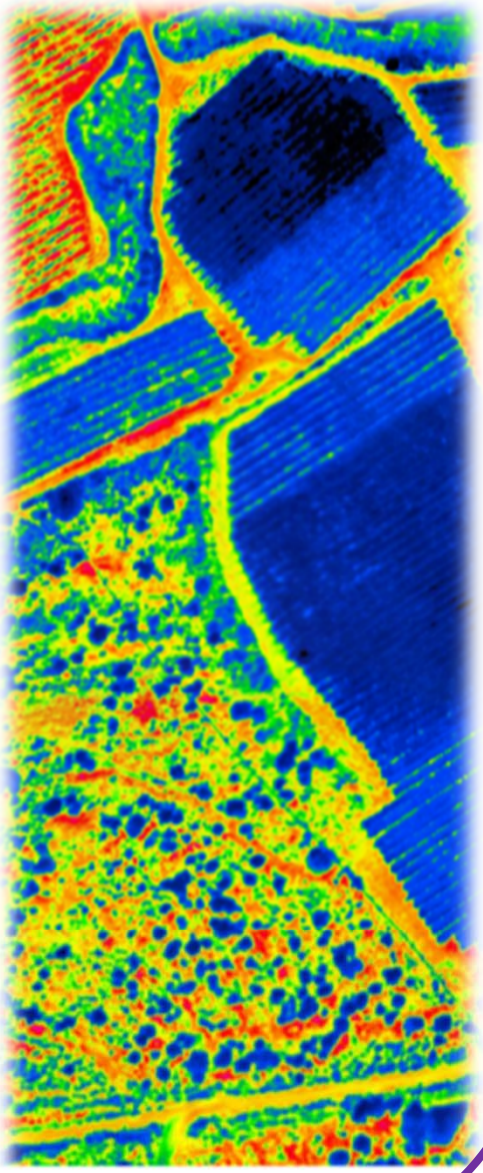
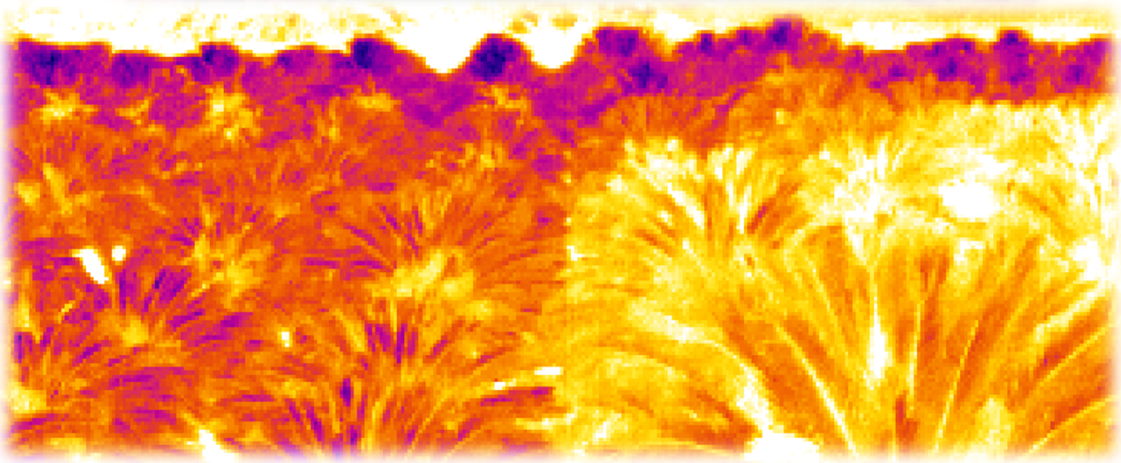
Aerial thermal image above vineyards





Detection of irrigation malfunctions

Thermal image above palm trees



The temperature difference between the two differentially irrigated plots is approximately 2°C.

More missions to come….

- Producing and maintaining ecological advantages and equilibrium, open spaces, water and natural resources for present and coming generations.
- Protecting the landscape, conserving the soil, using marginal water.

Agriculture, Forestry & Conservation:

A lesson from a small country

Ecological corridors

Future Research Priorities

- **Amplify productivity & sustainability criteria**
- **Adapt to extreme environ. growth conditions:**
  - **-new varieties** (Use of genetic diversity, computational genomics and modern breeding skills)
  - **-improved Ag technology** (precision applications of any input)
- **Reduce losses** (From harvest to the consumer dish)
- **Distribute "Know how"** (Developing markets)

Thank you for your attention