Instituto Nacional de Investigação Agrária e Veterinária, I.P.

AGROECOLOGY PARTNERSHIP

Summer School

Wellcome & introduction to the summer school

Mod. CI-005/1 (04.2020)

Organiser: INIAV

Location: Portugal/Elvas

Date: 27-29 April 2026

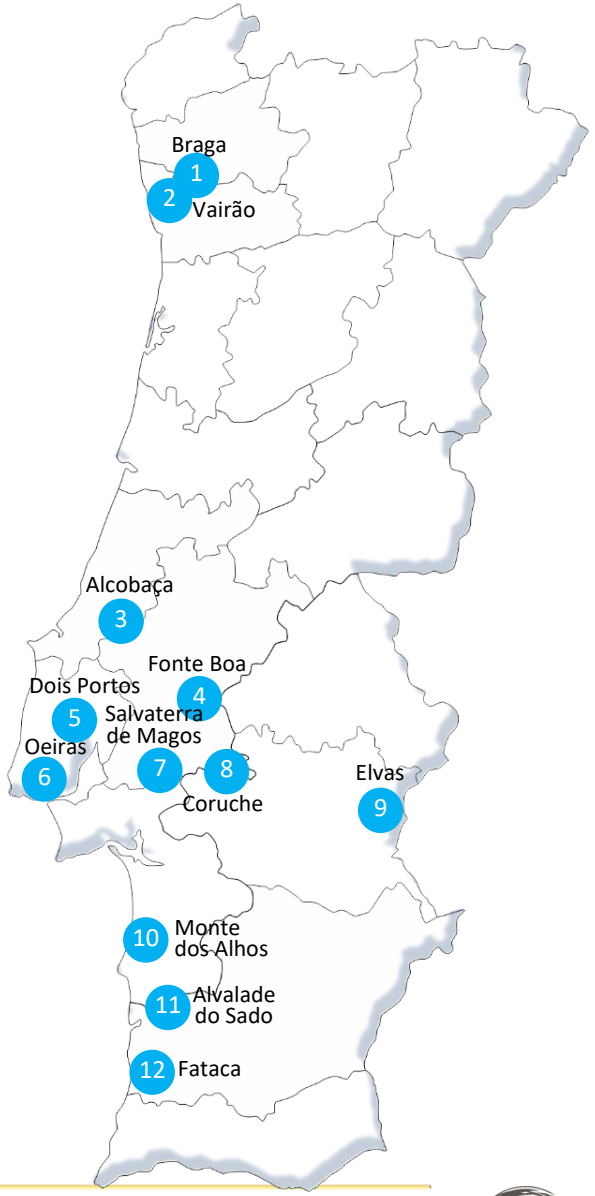
António Cordeiro
Diretor da UEISBRG

National Institute for Agrarian and Veterinarian Research

- This is a National Laboratory of the Ministry of Agriculture and Maritime Affairs.
- With several centers in Portugal (Innovation Hubs) and the headquarters are located in Oeiras, near of Lisbon.
- At the Elvas Innovation Hub, the main activity is plant breeding, with research programs focused on forage species, pastures, cereals and olive trees.

National Institute for Agrarian and Veterinarian Research

1. Innovation Pole Braga
   Portuguese Plant Gene Bank (BPGV)
2. Innovation Pole Vairão (Vila do Conde)
3. Innovation Pole Alcobaça
   Fruit Growing Hub
4. Innovation Pole Fonte Boa
   Portuguese Animal Gene Bank (BPGA)
5. Innovation Pole Dois Portos
   Viticulture and Enology Hub
6. Innovation Pole Oeiras (**Headquarters**)
7. Innovation Pole Salvaterra de Magos
8. Innovation Pole Coruche
9. Innovation Pole Elvas
   Plant Breeding Station
10. Innovation Pole Monte dos Alhos
11. Innovation Pole Alvalade do Sado
12. Innovation Pole Fataca



WHAT WE DO...
RESEARCH & INNOVATION

MAIN RESEARCH AREAS:

- Environment and Natural Resources
- Genetic resources
- Plant and Animal Genetics and Breeding
- Agrarian Systems: Production and Sustainability
- Forestry
- Animal Production
- Plant Pathology
- Animal Health
- Food and Feed Safety
- Food and Forestry Technology

INIAV'S MISSION

- Applied Research and knowledge transfer
- Scientific and Technical Support to public policies
- Laboratorial Services

- Public Mission (mandatory):
  - National Reference Laboratories (NRLs)
  - Conservation of Genetic Resources
    - Portuguese Plant Germplasm Bank (BPGV)
    - Portuguese Animal Gene Bank (BPGA)
    - National Collections of Reference

NATIONAL REFERENCE LABORATORIES

Internacional Reference Laboratory

- Reference Centre for Contagious Bovine Pleuropneumonia

National Reference Laboratories

- Animal Health
- Food Safety
- Fertilizer Conformity
- Plant Pathology
- Genetically Modified Organisms (GMO)

Other Laboratory Services

- Molecular biology
- Molecular genetics
- Soil Analisis
- Support for agro-food industry

GENETIC RESOURCES

INIAV has a central role in the preservation of national genetic resources, particularly in the food sector where in some items constitute world heritage

INIAV has under its responsability:

- the **Portuguese Animal Gene Bank** (together with DGAV), located in Santarém
  ensures the collection and maintenance of germplasm including semen, embryos, somatic cells and DNA from all domestic animal landraces

- the **Portuguese Plant Germplasm Bank** (BPGV), located in Braga
  Representative collections of germplasm of the more important agricultural species of mainland Portugal and the Islands

- **National Reference Collections** (some unique in the country and of considerable scientific value)
  - *Ampelographic collection of grape vines; olive trees and fruit trees*
  - *Collection of industrial microbiologyical cultures (CCMI)*
  - *Herbaria, Index Seminum, collection of cork slabs; collection of wood slabs; Index xylariorum (seed collection) and collection of fungi*

Thank you

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AGROECOLOGY PARTNERSHIP

Summer School

Mediterranean agricultural systems

Organiser: INIAV

Location: Portugal/Elvas

Date: 27-29 April 2026

António Cordeiro
Researcher UEISBRG

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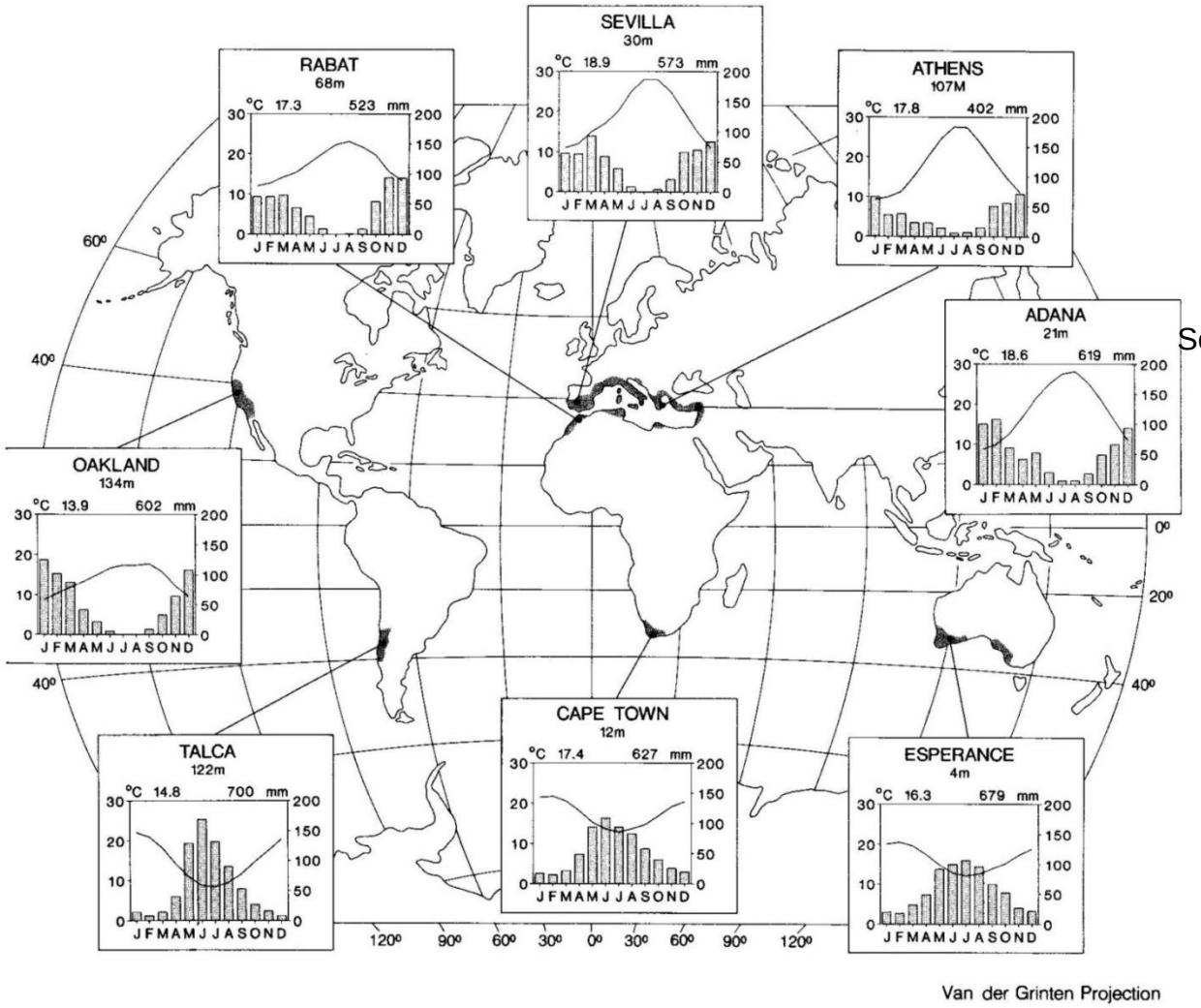
Distribution of Mediterranean environments in the world

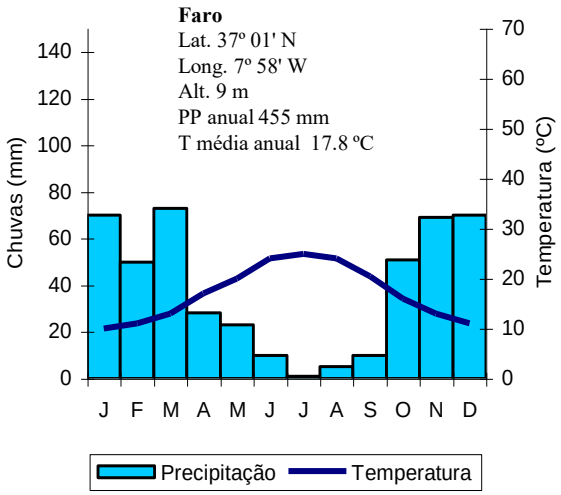


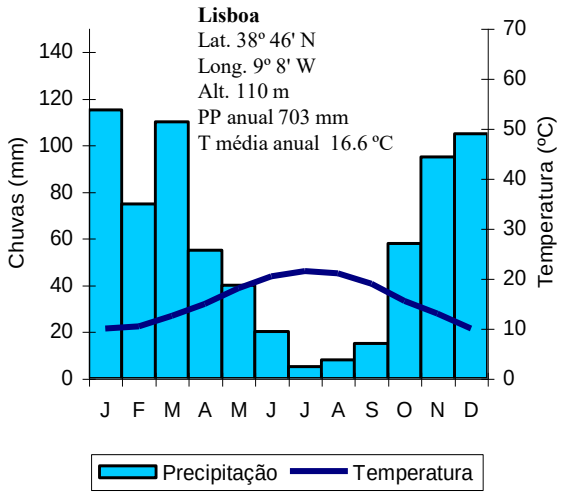
Southeastern Turkey

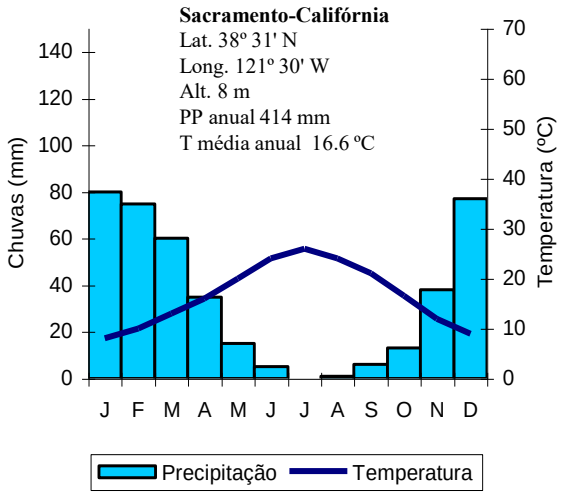
(Loss e Siddique, 1994)

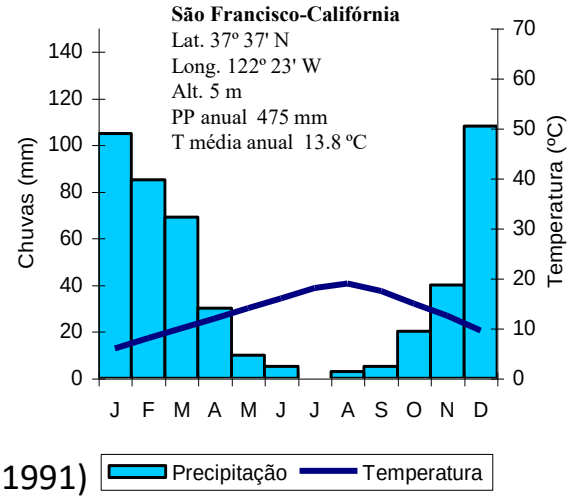
Ecological Characterization of Mediterranean Regions

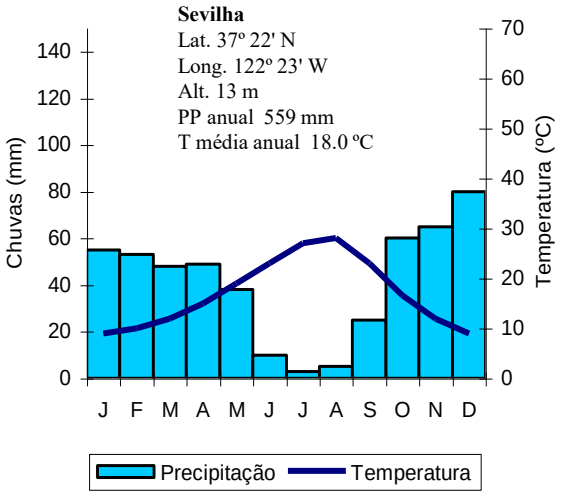
- **dry summer**
- **High irregularity in rainfall**
- **Frequent succession of dry years and rainy years**











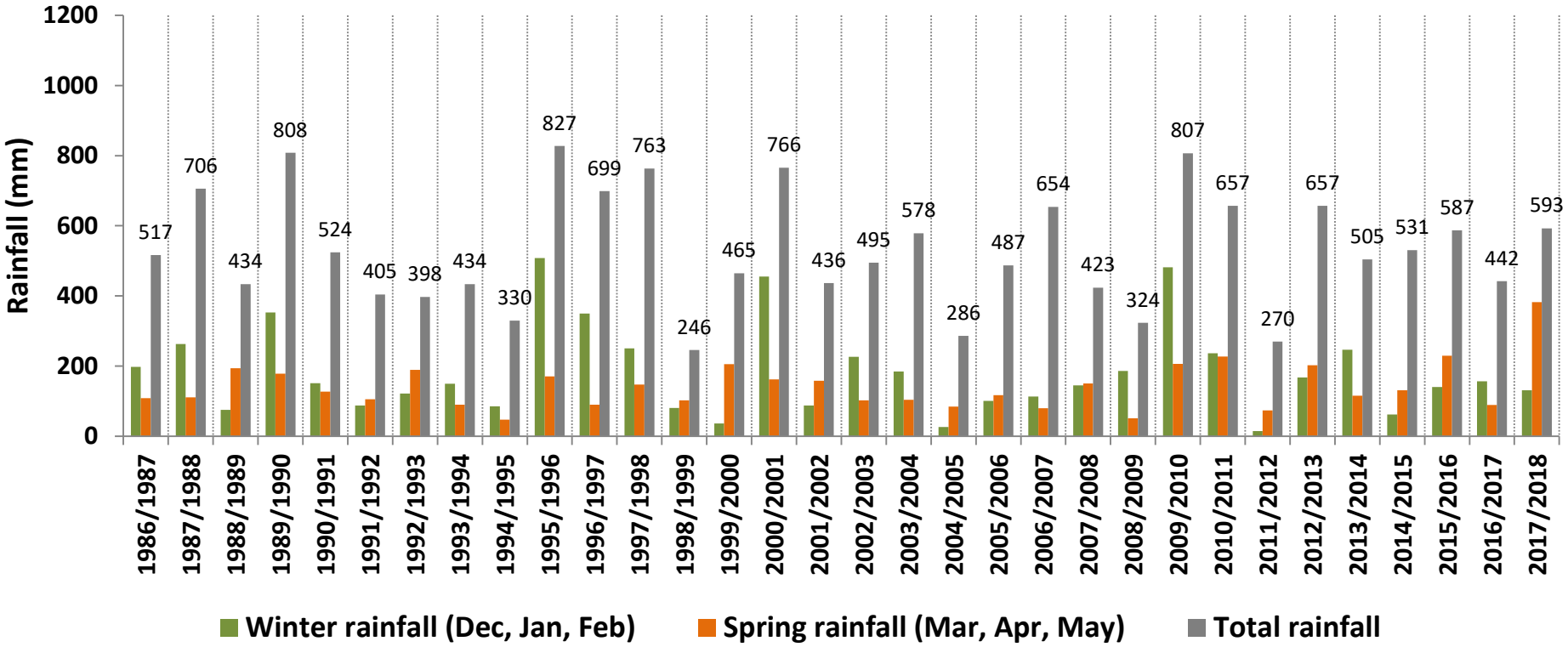
(Adapted from Feio, M., 1991)

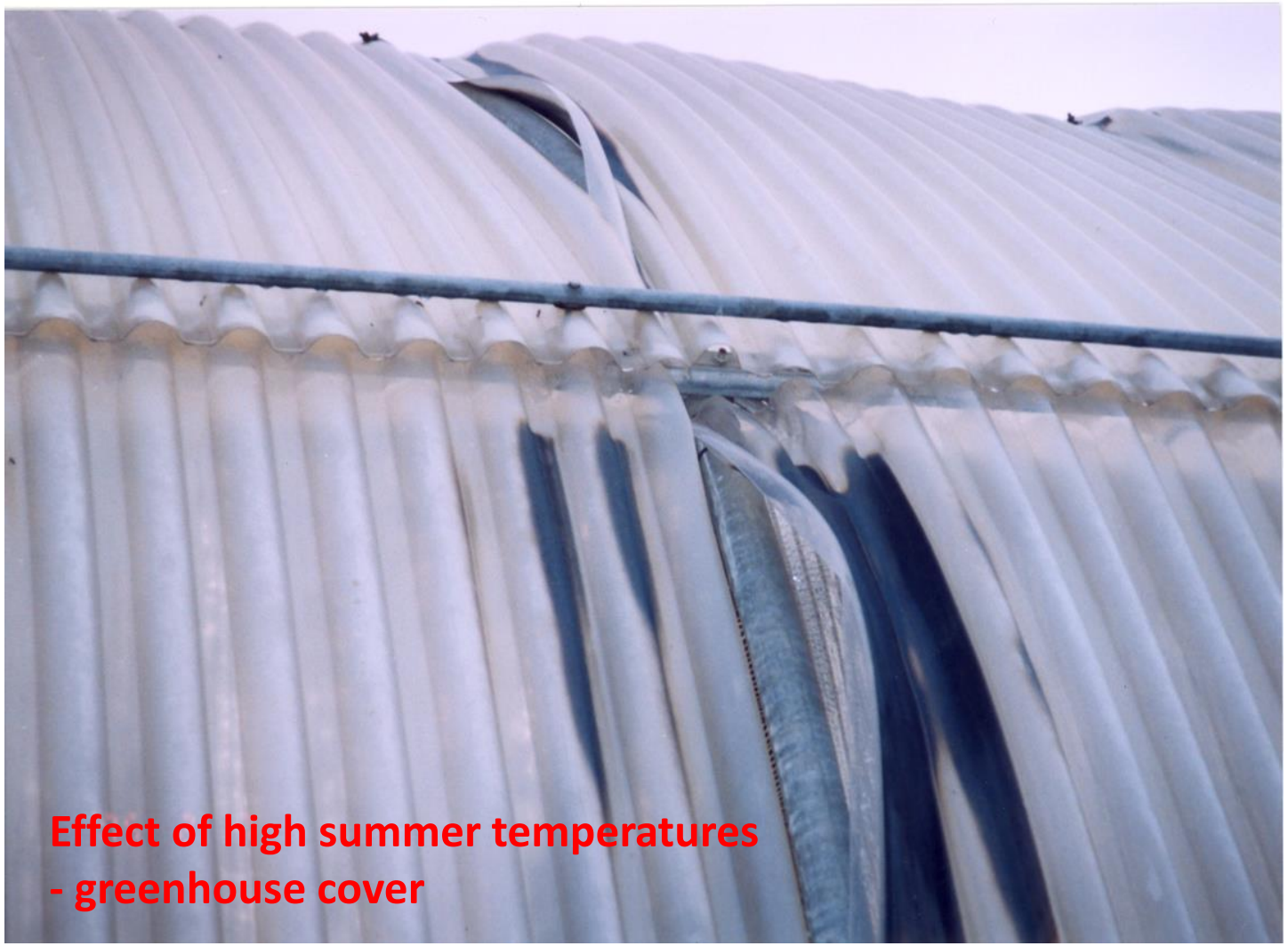
Portugal: Heavy rainfall, January 2026

Portugal: reservoir of a dam, year 2024
(severe drought)

Portugal: Effects of high-intensity and highly concentrated rainfall - floods, March 2026

Evolution of rainfall in Elvas - 32 years (1996/97 to 2017/18)

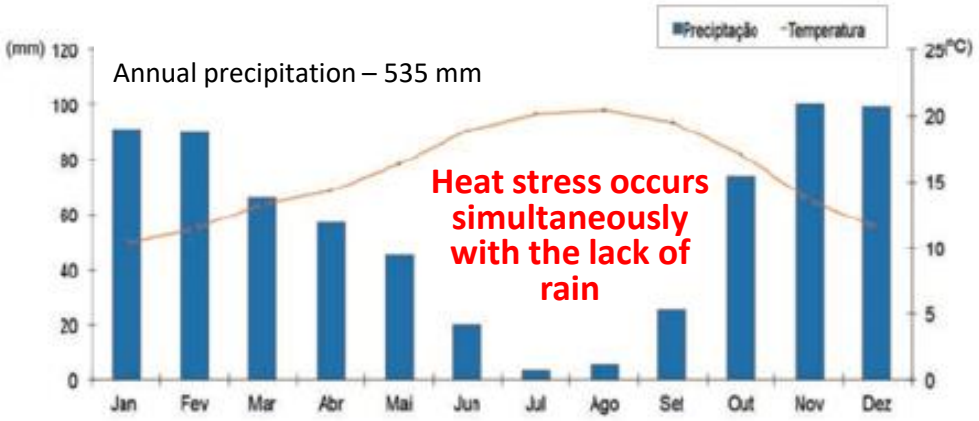



Effect of high summer temperatures
- greenhouse cover

The frosts that form in early spring can be quite intense - pivot irrigation system

How do you characterize an average year? (average of 30 years)

Portugal

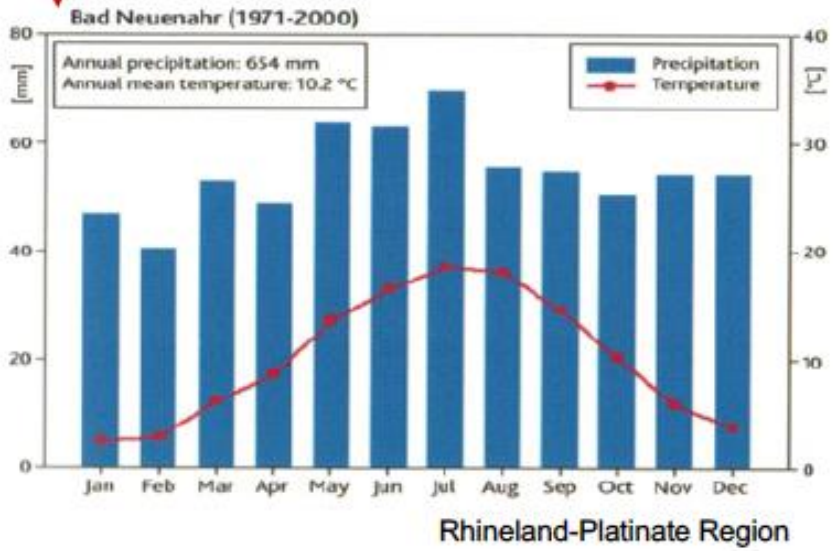


Annual precipitation – 535 mm

Heat stress occurs simultaneously with the lack of rain

Elvas-Portugal

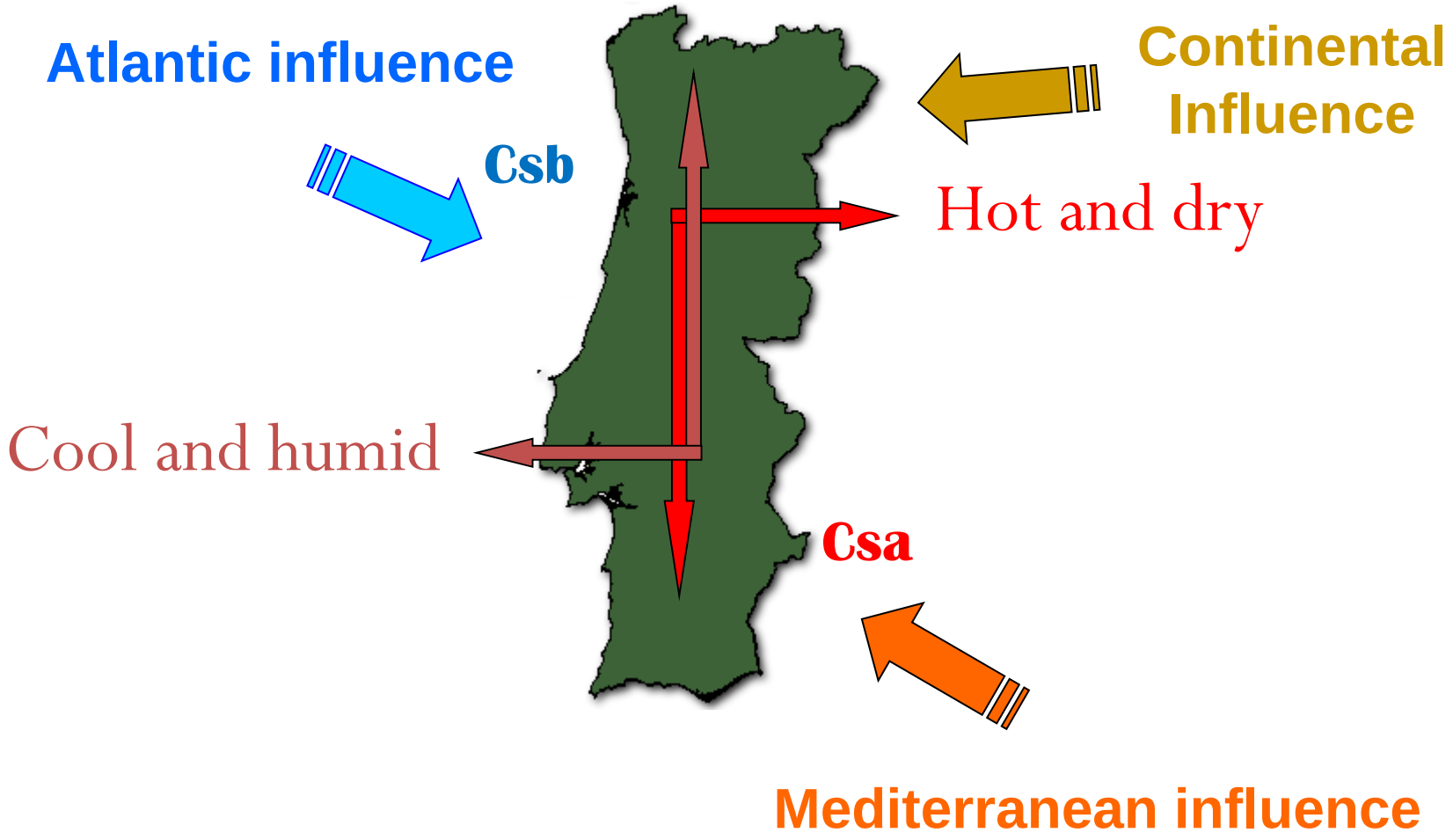
Germany



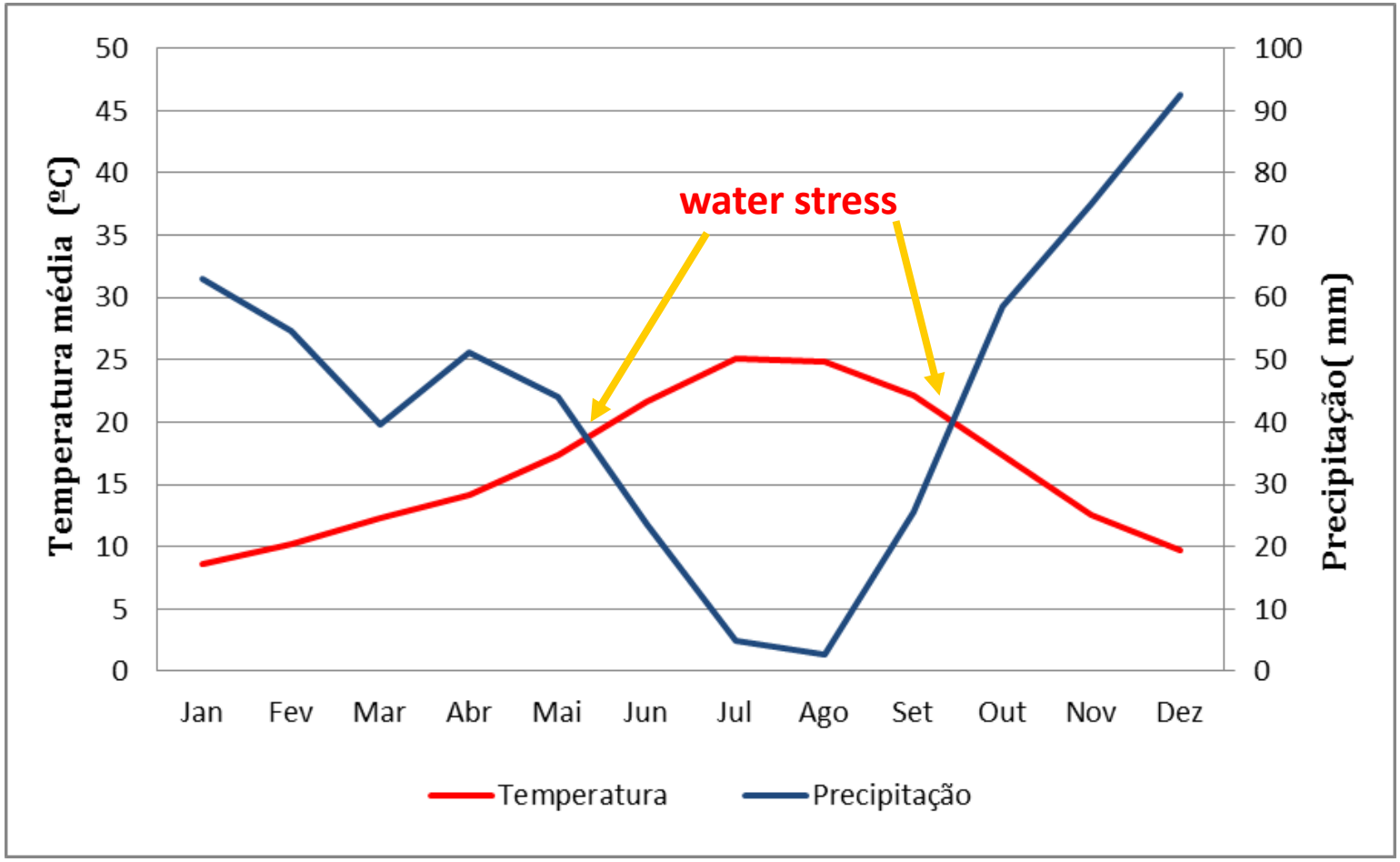
Rhineland-Platinate Region

Dados: DGADR 2016, Cultivar n.º 5 e Ministry for Economic Affairs 2015, Vineyard Soils of Rhineland-Platinate

Weather patterns



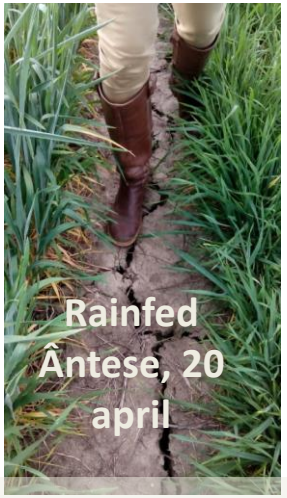
Gaussen ombrothermic diagram with the 30-year average (1970-2000 period) for the Elvas meteorological station.



Annual precipitation= 535mm

MEDITERRANEAN CLIMATE

Heat and water stress



rain filling, may 17th
Irrigated vs rainfed

Rainfed
Anthesis, april 20th
Early senescence and tiller death

Impact of Climate Change on Agriculture (and food production)

- **It is estimated that there are approx. 250.000 plant species**
- **About 50000 plant species are edible**
- **250 plant species are used**
- **15 crops provide about 90% of the calories in the human diet**
- **3 crops (wheat, rice and maize) provide 60% of these calories**

The most widely grown varieties of the these 3 crops are genetically uniform

– Small number of varieties → GENETIC VULNERABILITY

EXAMPLES OF PRAGMATIC AGROECOLOGICAL PRACTICES:

- **Diversification** – Planting different crops, vegetables and livestock can improve resilience, reduce pest and disease problems, and enhance biodiversity
- **Soil Health Management** – Conservation Agriculture using cover crops, no till practices, with the objective to improve soil fertility, structure and water retention…
- **Integrated Pest Management** in order to minimize pesticide use and protect beneficial insects
- **Water Management** promoting practices of WUE (Water Usage Effectiveness is a sustainability metric calculated as the annual site water usage (liters) divided by the IT equipment energy usage (kWh))
- **Community Engagement** supported on local communities to establish farmer-led initiatives

As in the past, genetic resources and breeding will be one of the most important keys to promote ADAPTATION.

Portuguese Plant Breeding Station
INIAV, IP
Elvas

Cowpeas

Ornithopus compressus

Ornithopus sativus

Olive breeding

Thank you for
your attention.

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