REGIONE BASILICATA

nereus
network of european regions using space technologies

TeRN

copa cogeca
european farmers european agri-cooperatives

ERIAFF Network
European Regions for Innovation in Agriculture, Food and Forestry

WHEN SPACE MEETS AGRICULTURE

Fostering interregional collaborations, investments and definition of user requirements

UNIVERSITÀ DEGLI STUDI DELLA BASILICATA 1982

ARCHITETTURA, AMBIENTE PATRIMONI CULTURALI
Dipartimento delle Culture Europee e del Mediterraneo

REGIONE BASILICATA

Dichio B., Montanaro G., Mininni A., Amato M., Perniola M

Sustainable irrigation management strategy in semi-arid climate conditions in South Italy

Bartolomeo Dichio

bartolomeo.dichio@unibas.it

Report Intergovernmental Panel for Climate Change (Ipcc)

September 2013 – Stockolm Approved Berlin,

Germany (7-11 April 2014)

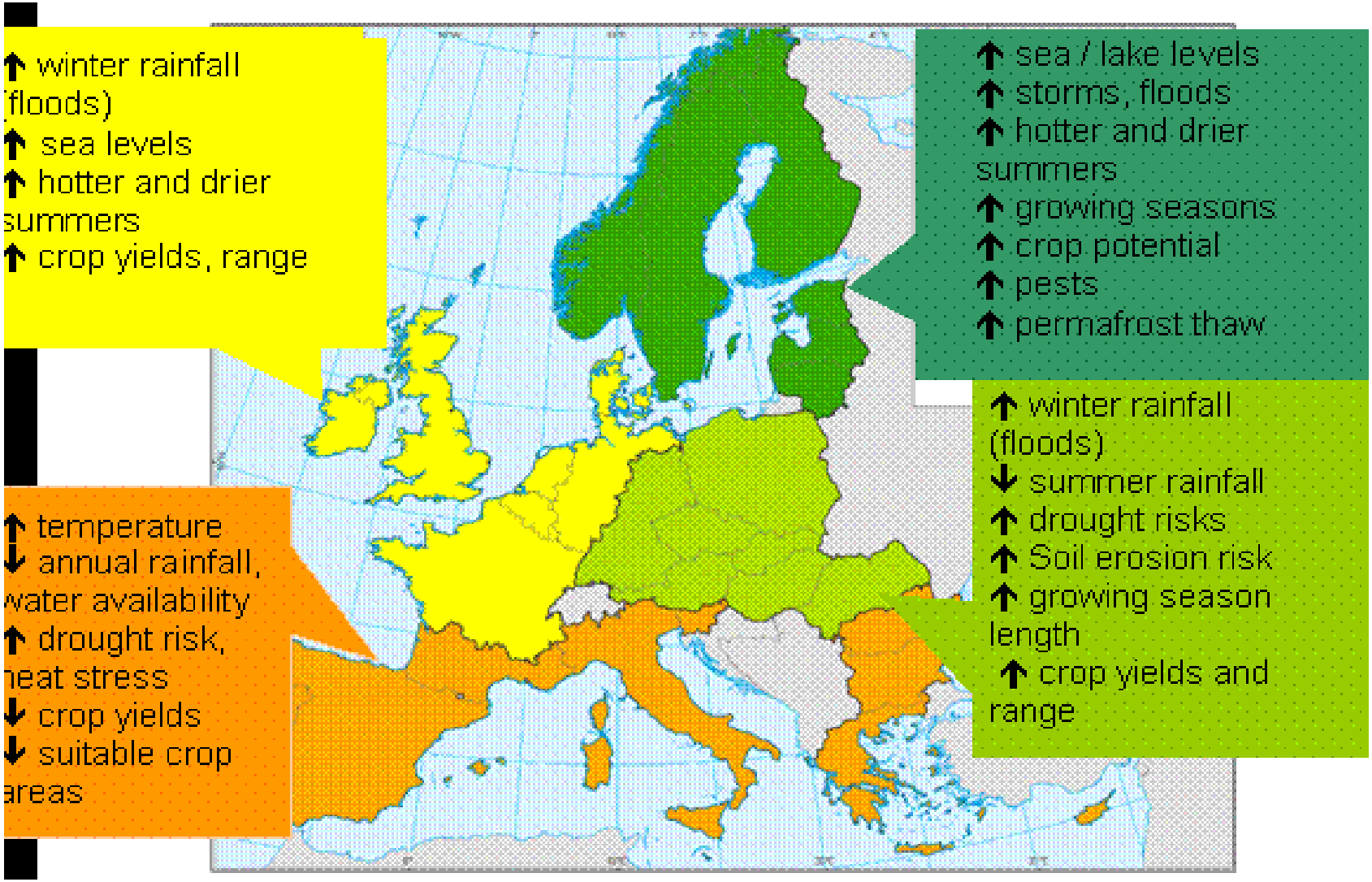
There are not significant effects on mitigation of Climate Change

- ***GLOBAL TEMPERATURES ARE LIKELY TO RISE BY 0.3 TO 5 °C BY THE END OF THE CENTURY.***

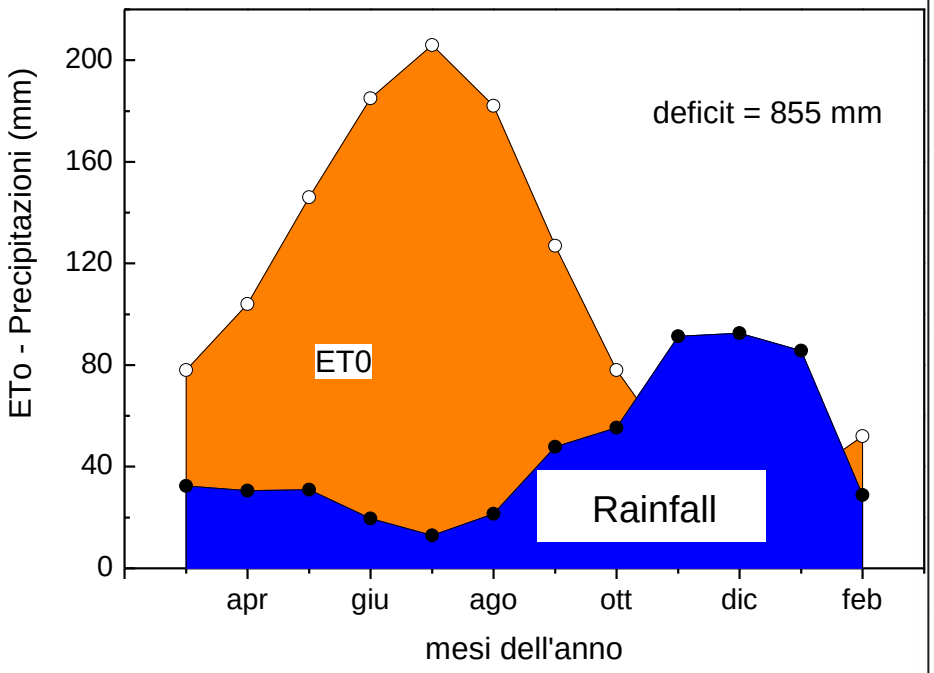
Parties to the U.N. Framework Convention on Climate Change (UNFCCC) reached a landmark agreement on December 12 in Paris

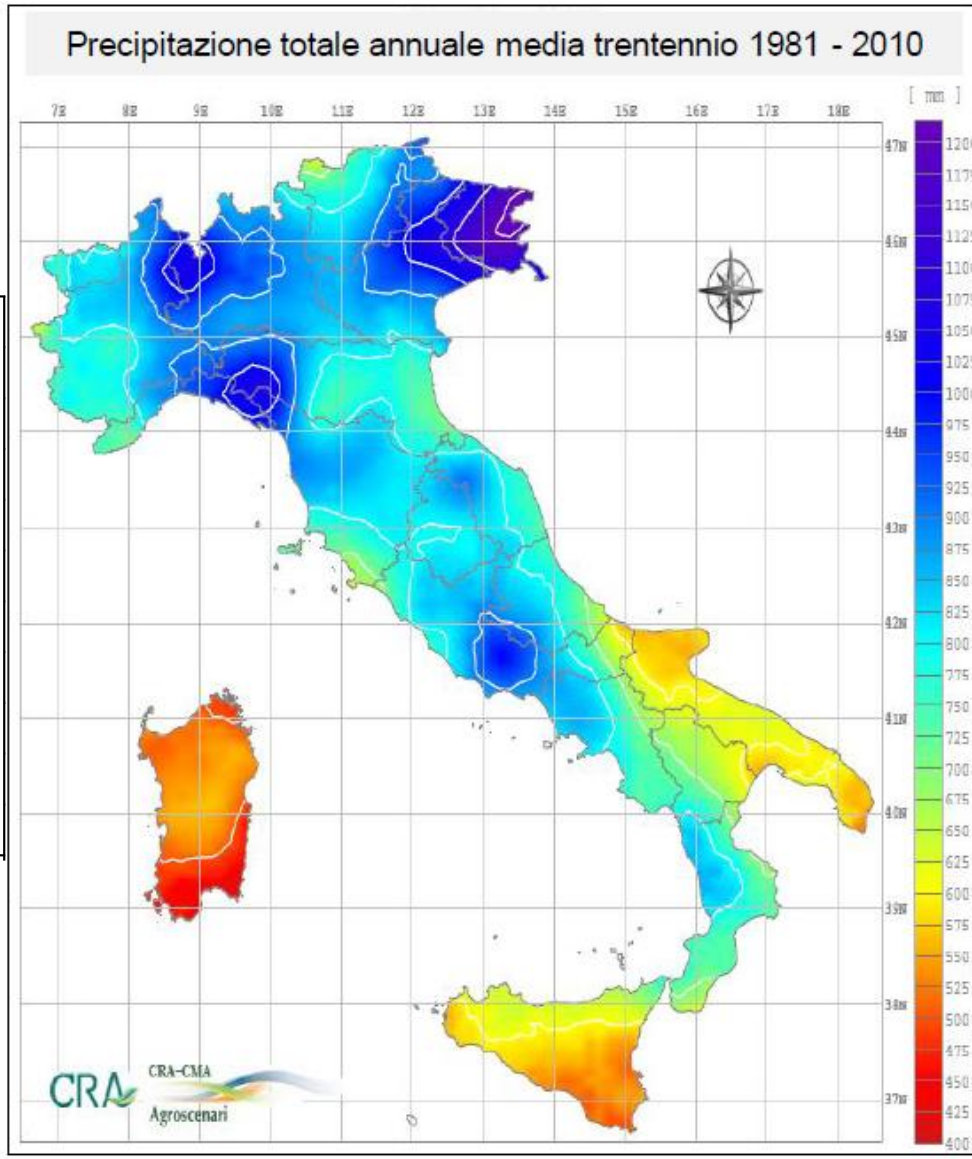
Reaffirm the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees

Climate change in Europa



http://ec.europa.eu



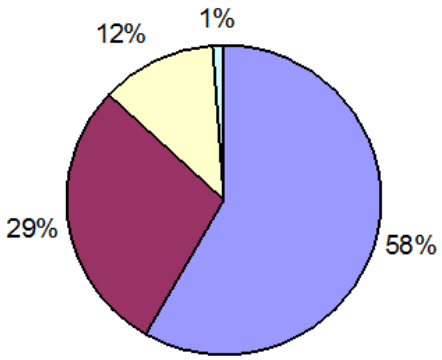


Esposito S. et al. 2014 Atti convegno Progetto Agroscenari

Basilicata – ITALY

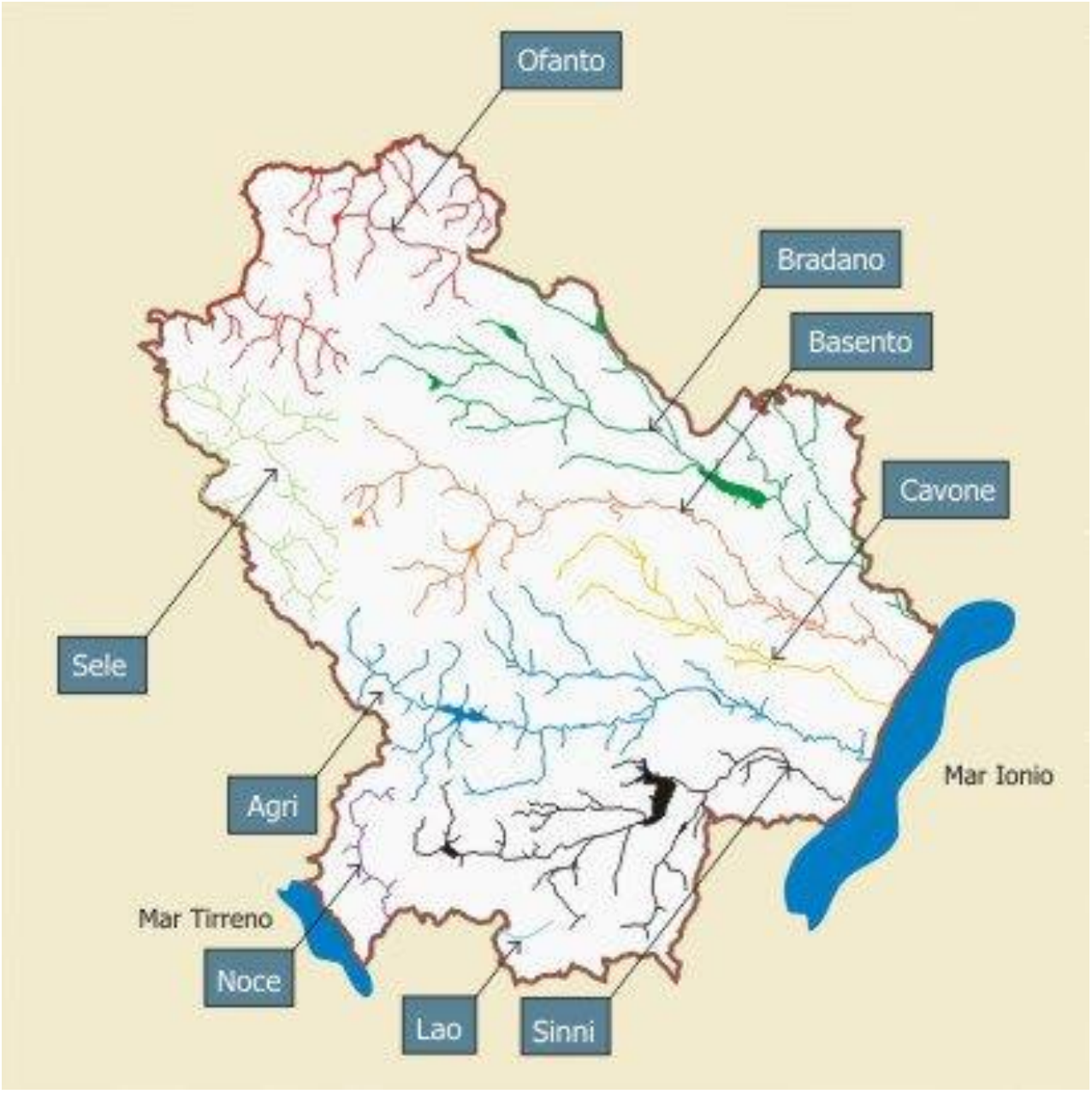
agriculture

Land use of the whole territory



Agricultural land
Forests
Natural areas
Artificial areas

BASILICATA: hydrographical system



5 main rivers

BASILICATA Region: WATER

Acerenza

Maximum capacity of dams:

950 Mm3

Genzano

Basentello

Camastra

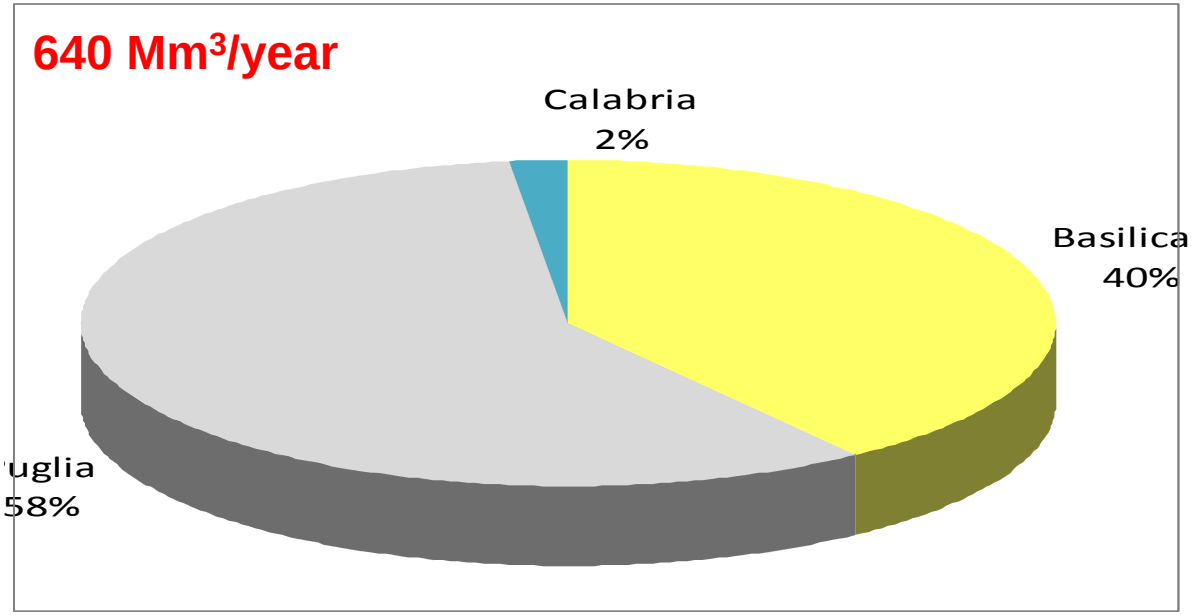
Pertusillo

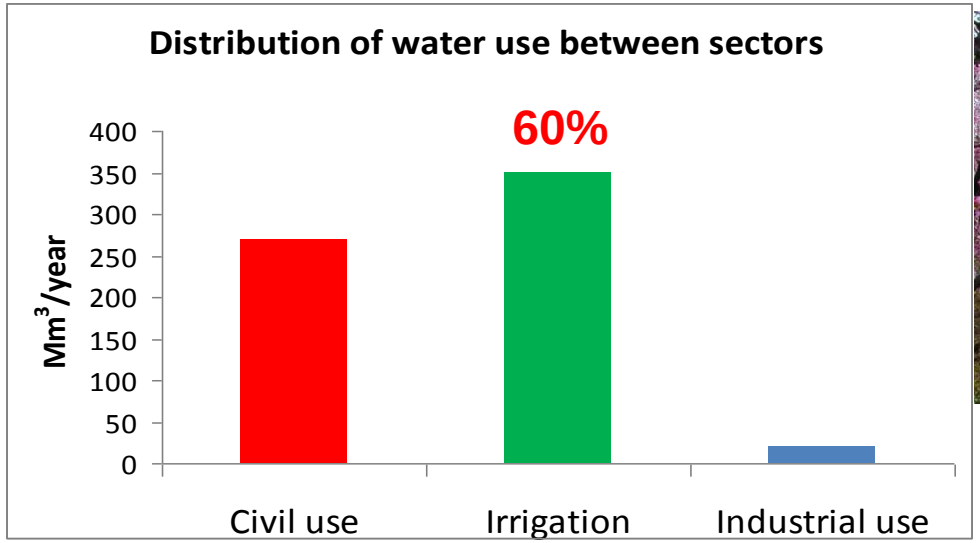
Montecotugno

San Giuliano

BASILICATA Region

Sharing of water resources with adjacent regions





Irrigated fruit crops in Basilicata: 72 %

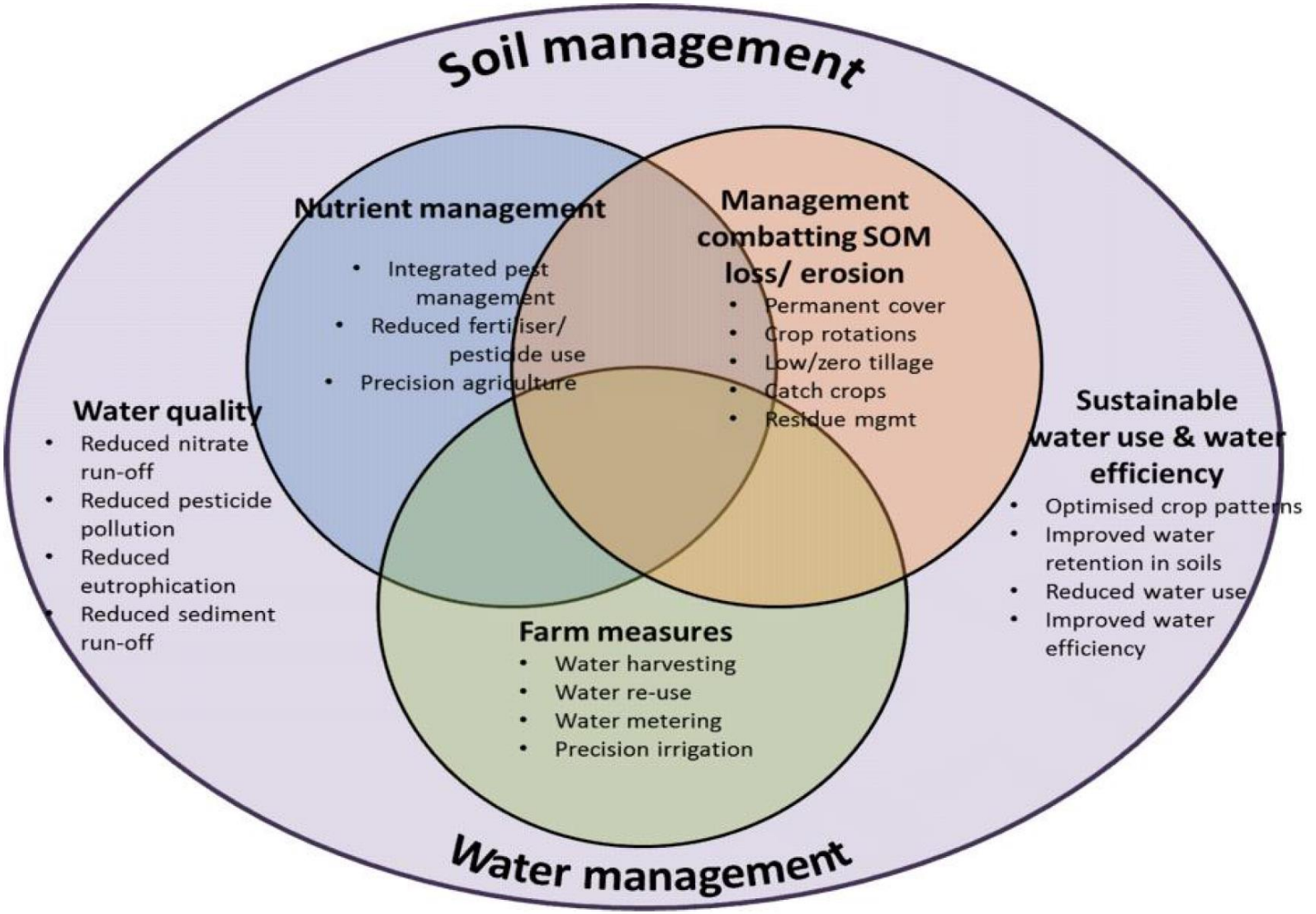
Climate-Smart Agriculture (sustainable) is needed

CSA is agriculture that

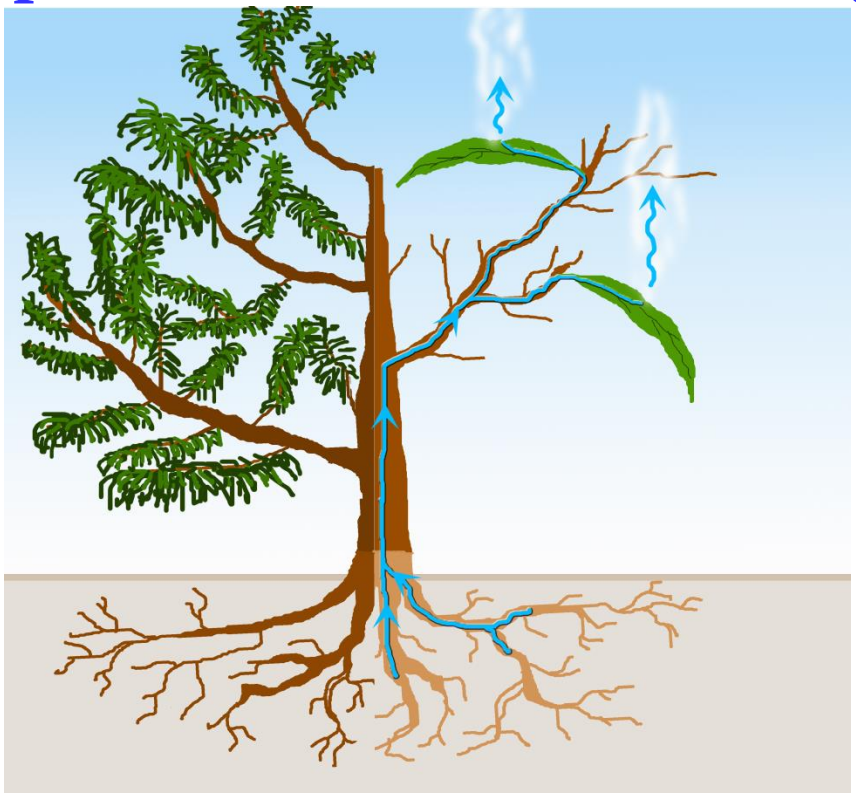
- **increases yields (poverty reduction & food security),**
- **makes yields more resilient in the face of worsening weather conditions (adaptation), and**
- **transforms the farm into a solution to the climate change problem (mitigation).**

(World Bank , 2012)

Potential win-wins for Sustainable soil and Water Outcomes



Optimization water use in Agroecosystem



$$WUE = \frac{\text{Biomass (Kg)}}{\text{Transpired Water } (m^3)}$$

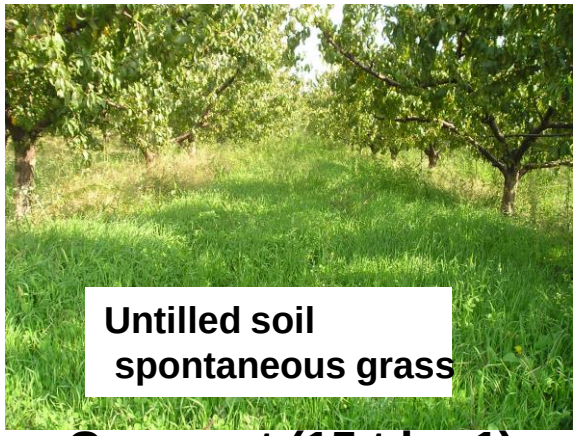
$$WP = \frac{\text{Marketable Yield value}}{\text{Irrigation water}}$$

WP = Water Productivity

Sustainable

Peach orchard
cv.Super Crimson/GF667
500 tree/ha

conventiona



Untilled soil
spontaneous grass

Soil management

Compost (15 t ha-1)
Mineral N if necessary

Fertilization

Mineral
fertilizers

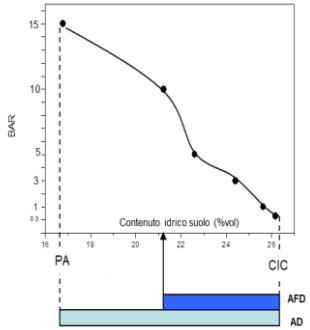
Pruning material

Cipping pruning residues into
the soil

Guided drip irrigation
Crop evapotraspiration and
Soil Water Balance

Water balance implementation

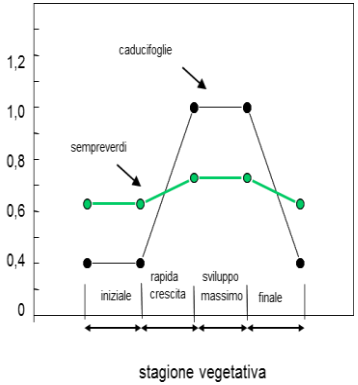
Weather Parameters (ET_0)



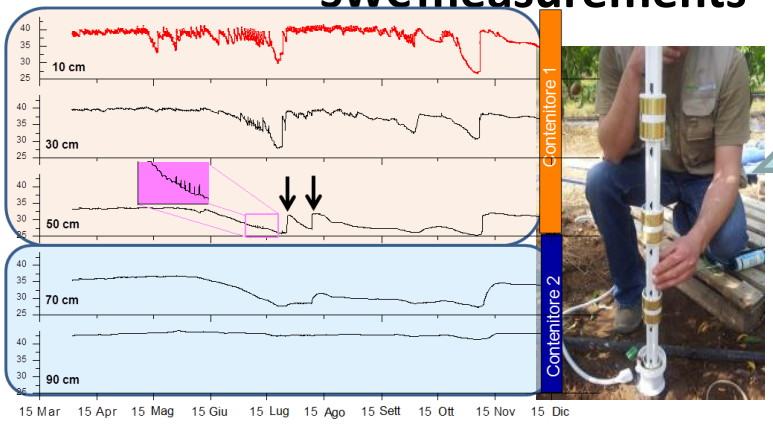
Soil data

Soil water balance

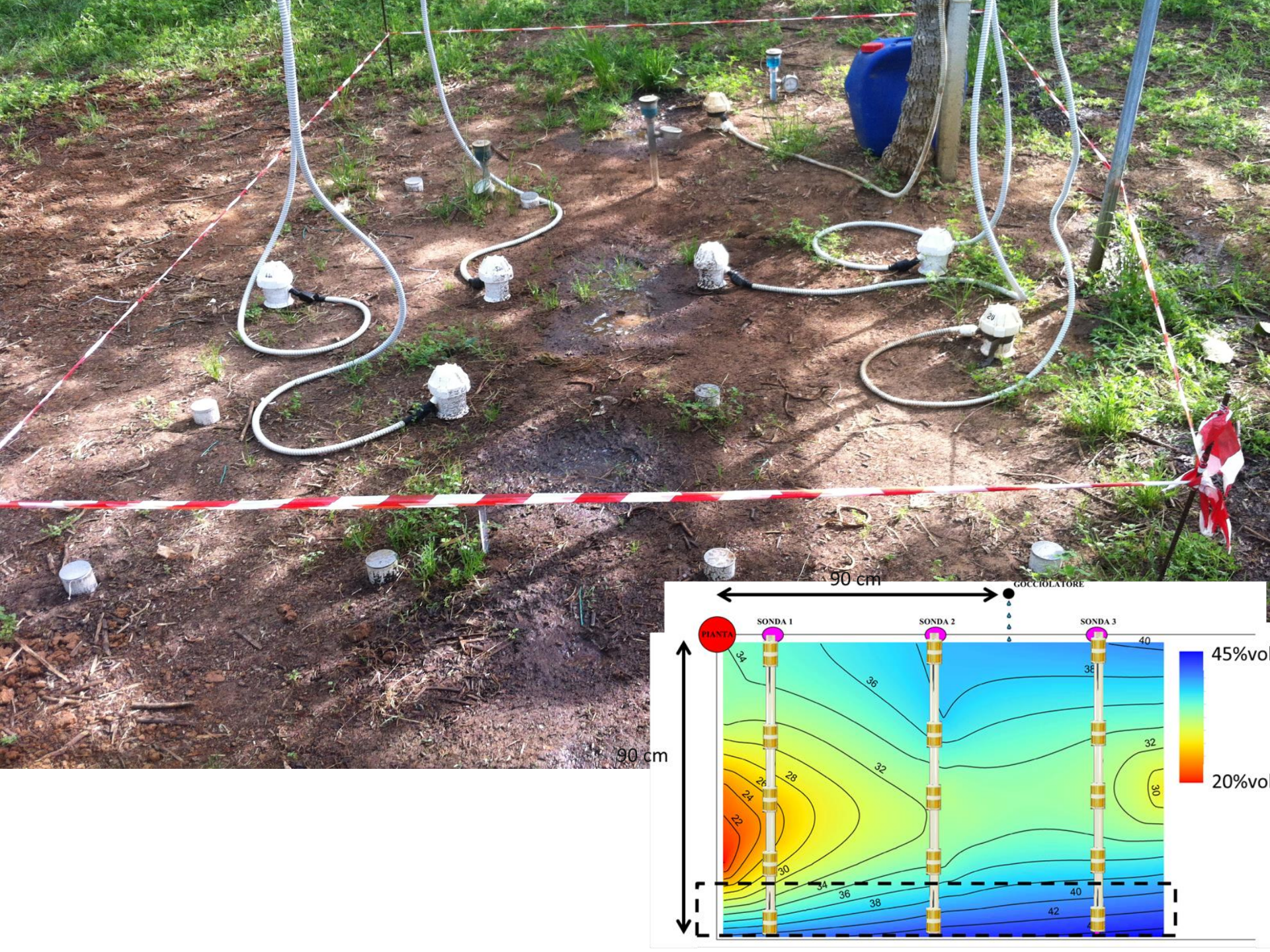
Crop data

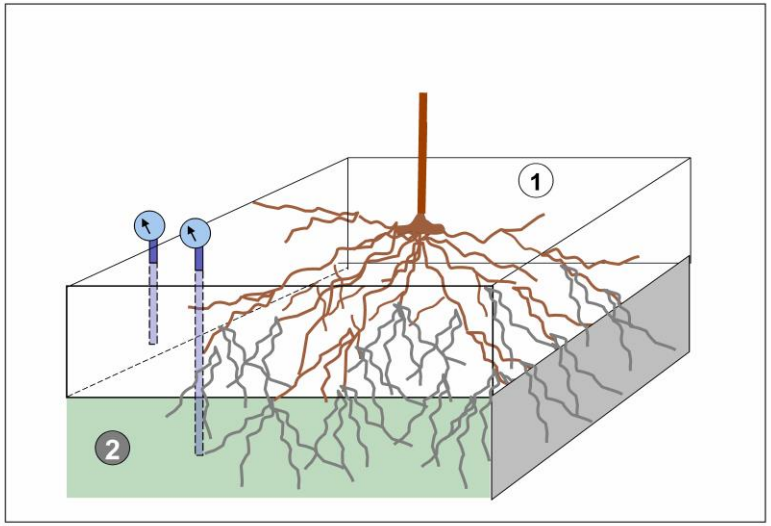


SWC measurements

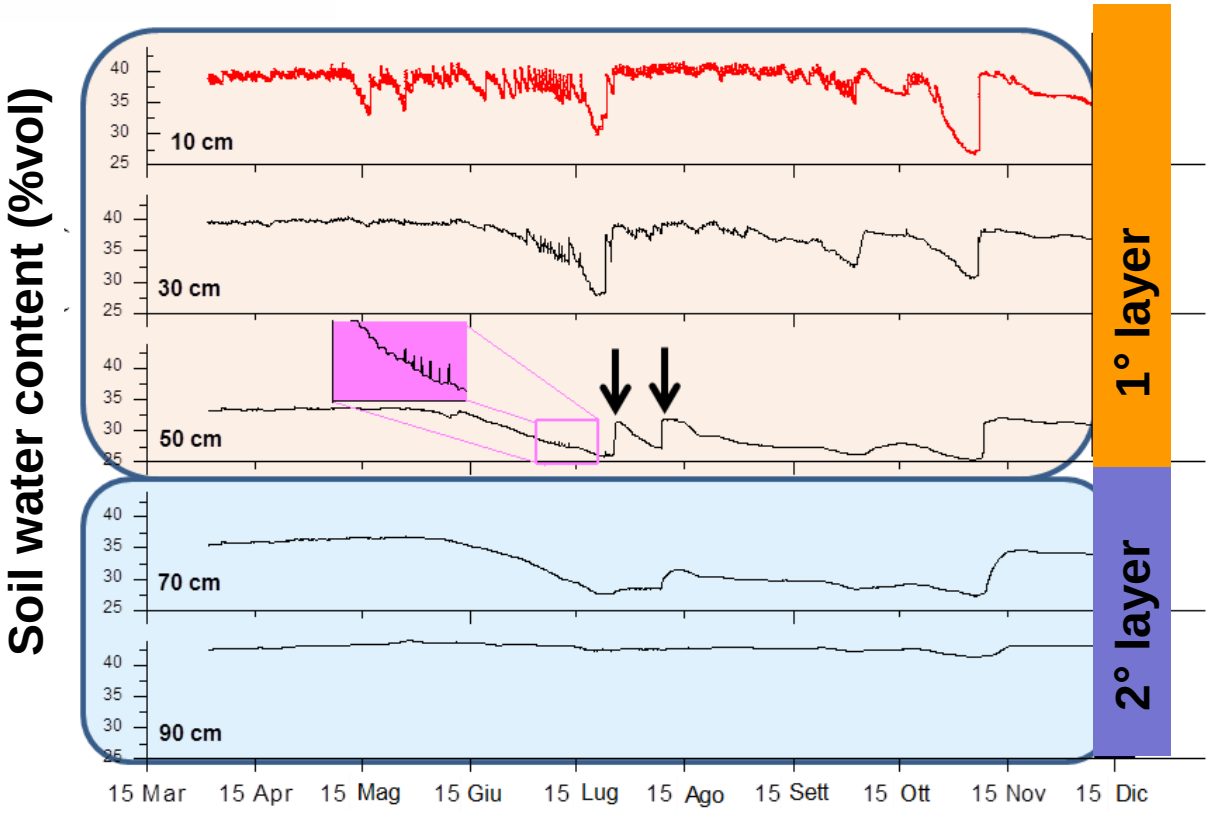


Water balance Optimased


90 cm
GOCCIOLATORE
PIANTA
SONDA 1
SONDA 2
SONDA 3
90 cm
45%vol
20%vol
34
36
38
40
32
28
26
24
22
30
42

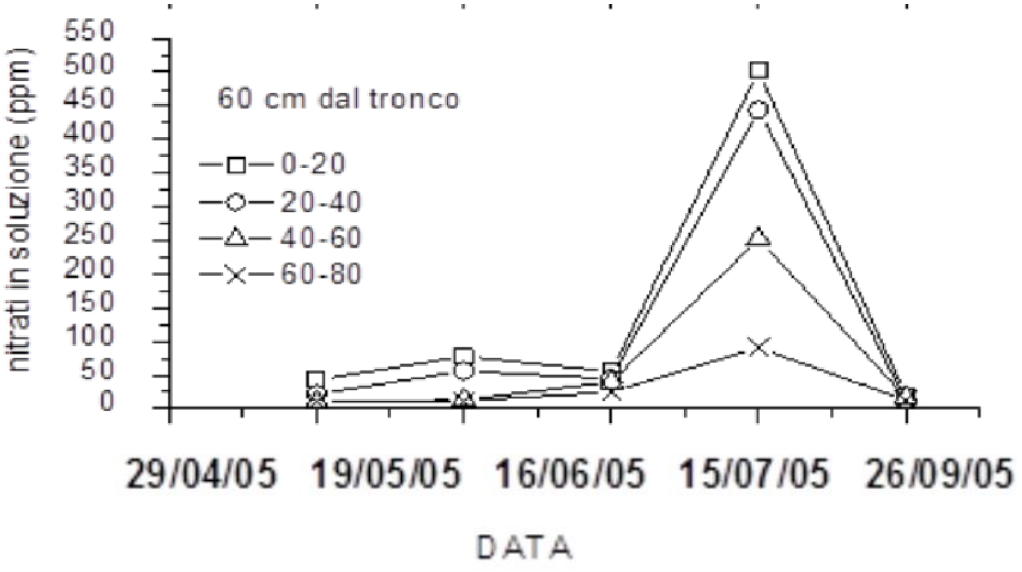


the continuous monitoring of soil water content along the soil profile give us information to correct the irrigation scheduling



Wetted soil by irrigation 90 cm

Water Table 120 cm



Optimization and Application of Regulated deficit irrigation

From bud break

To Harvest 100% ETc

Post - harvest

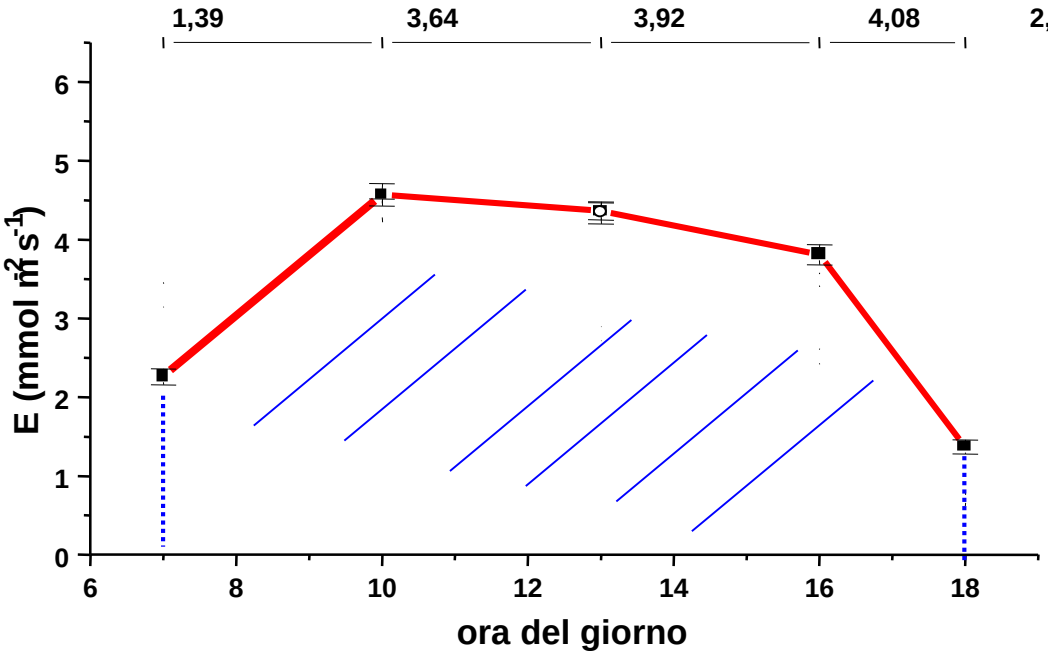
Deficit application
50% ETc

march/July.

At the end of september

B. DICHIO, C. XILOYANNIS, A. SOFO, G. MONTANARO (2007). Effects of post-harvest regulated deficit irrigation on carbohydrate and nitrogen partitioning, yield quality and vegetative growth of peach trees. PLANT AND SOIL (ISSN:0032-079X). 127- 137. 290;

How much water can be saved with summer pruning?



2,3 litri H_20 x m^2 of leaves

Daily w. transpired 66 lt/tree

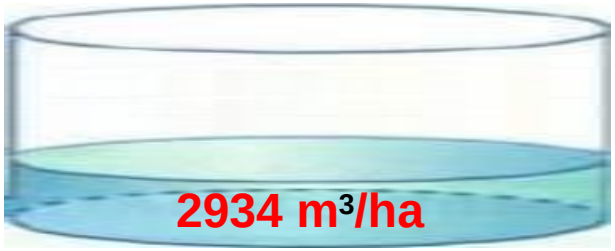
Summer pruning 10 m^2 p^{-1}

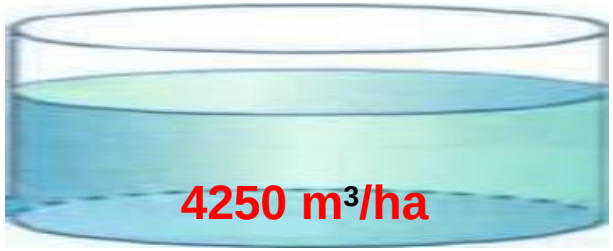
24 L $d^{-1}p^{-1}$ → **60-80 g**

about **750 m^3/ha**

About **1000 m^3/ha**

Increase soil water holding capacity



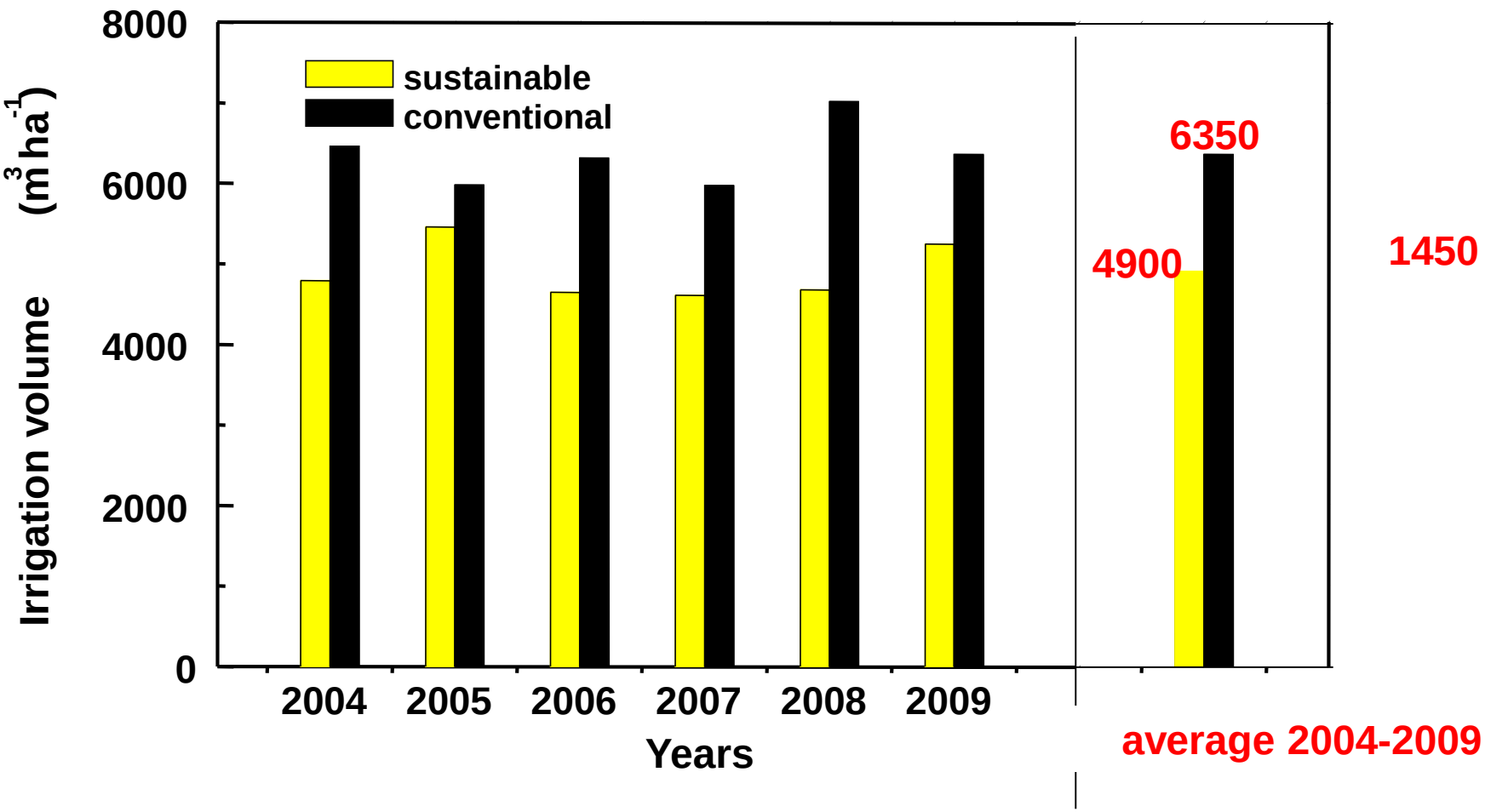


Mechanical tillage reduces water infiltration causing runoff and erosion processes

Sustainable management practices increase infiltration rate and water storage in soil

>1.300 m3/ha

Irrigation volume (m^3 ha^{-1})



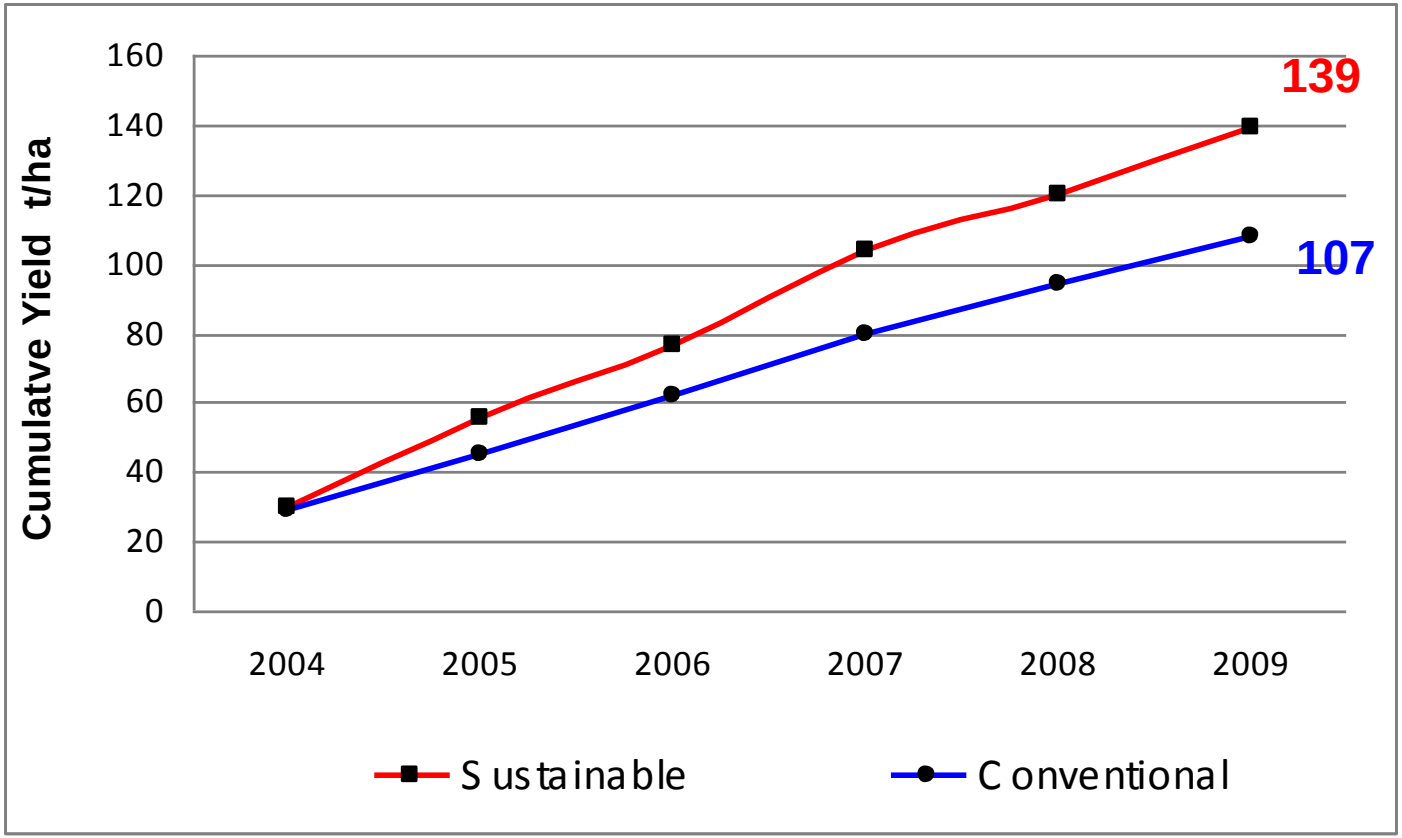
Dichio et al. 2011

$$W.P. = \frac{\text{Marketable Yield value (€)}}{\text{Irrigation water (m}^3\text{)}}$$

Water footprint (L) /Kg of fruit

Sustainable	**220**
Conventional	**380**

Sustainable	**€ 2,11**
Conventional	**€ 1,34**



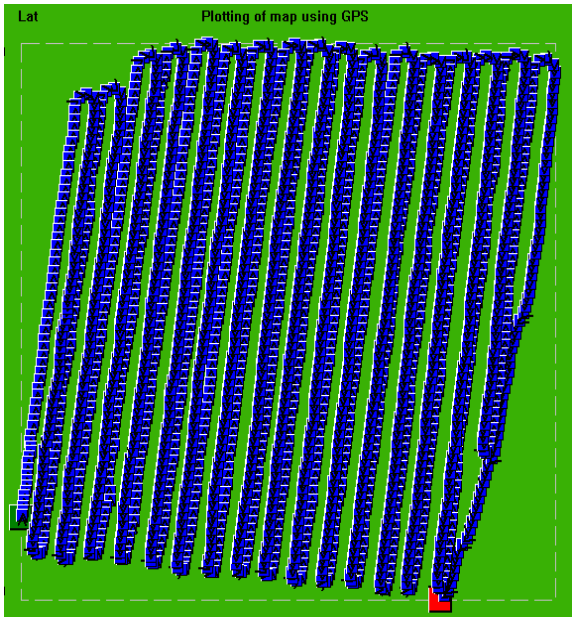
New Technologies in agriculture

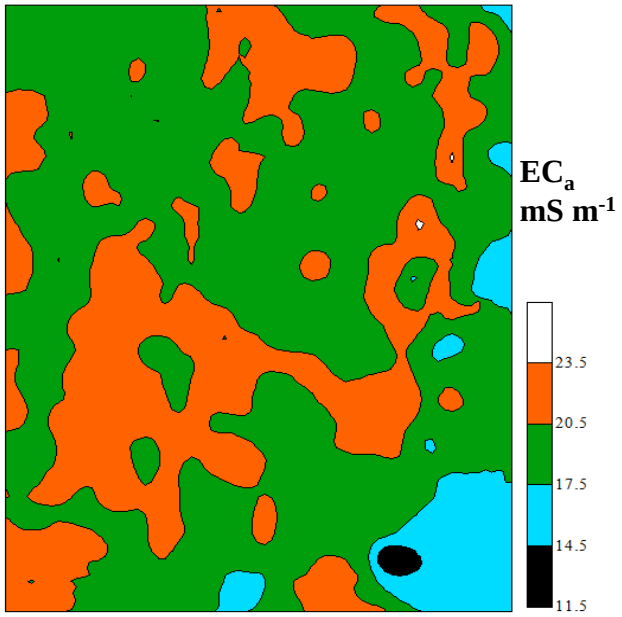
Profiler GSSI EMP-400
5000 values EC_a for site (1 hectar)

Elaboration & validation data (-8%)

To obtein soil variability maps (soil EC_a)
(data interpolation: kriging)

Orchard management support (nursery, establishment, irrigation, nutrition, etc)



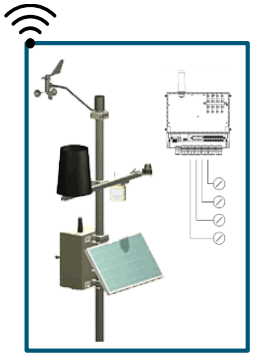


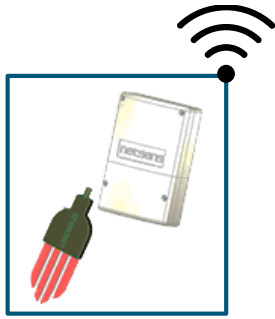
Validation and implementation of the innovations at field level (testing, scaling up, demonstration, training)

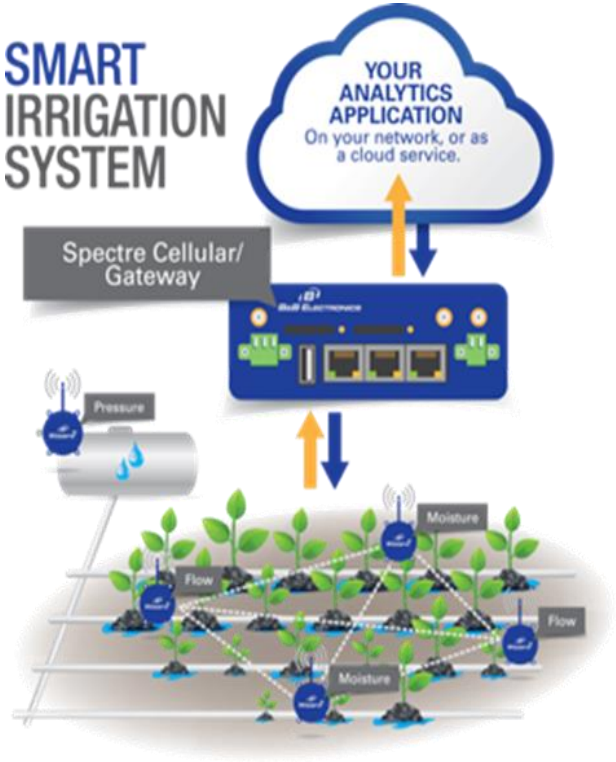
FIGARO
PRECISION IRRIGATION TECHNOLOGIES

Irriframe
IL PORTALE DELL'IRRIGAZIONE

Bluleaf
Agricoltura Consapevole
www.bluleaf.it







ERIAFF Network
European Regions for Innovation in Agriculture, Food and Forestry

A JOINT
ERIAFF – WIRE WORKSHOP

WIRE
Water & Irrigated agriculture Resilient Europe
EIP Water Action Group
Pooling resources – Innovating water

REGIONE BASILICATA

Inform – Prioritize - Collaborate

Regional Innovation Partnership on Water

Department Agriculture

Arpab
Alsia
Con. Bonifica
A. Bacino
Acq. Lucano
Unibas, TERN

Department Environment

Basilicata Innovation Partnership on Water

Definition of Priority Action: Operational Group

G.O. Water Irrigation

G.O. Water-Reuse

Other

European innovation Partnership

EIP Water

EIP AGRI

ERIAFF

European Commission

ISHS
International Society for Horticultural Science

MATERA 2019
EUROPEAN CAPITAL OF CULTURE

VENUE FOR

IX ISHS INTERNATIONAL SYMPOSIUM
ON IRRIGATION OF HORTICULTURAL CROPS.

Conveners

Prof. Bartolomeo Dichio — **Prof. Cristos Xiloyannis**

Unit of Fruit Science

LIFE 14 CCA/GR/00389 - AgroClimaWater

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B. Dichio
V. Nuzzo
G. Celano
G. Montanaro
D. Palese
A. Sofo
A. Tuzio
E. Lardo
A. Mininni
A. Fiore
E. Xylogiannis

Thank you

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European Water Stewardship EWS

LIFE 14 CCA/GR/00389 - AgroClimaWater

Promoting water efficiency and supporting the shift towards a climate resilient agriculture in Mediterranean countries

Project Beneficiaries:

SPYRIDIS A. - KOUTALOU V. G.P. YYETOS (Coordinator) www.yetos.gr

Hellenic Agricultural Organization "Demeter" Directorate General of Agricultural Research • Institute for Olive Tree, Subtropical Plant and Viticulture, www.nagref-sha.gr • Soil and Water Resources Institute www.lei.gr

Rodazakgro Ltd Environment & Quality www.rodazagro.gr

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Κ.Ε.Δ.Η.Π. Platanias Municipality Development Enterprise www.platanias.gr

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INFORMATION

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