

IRRIGATION



QUELLES STRATÉGIES POUR ÉCONOMISER L'EAU ? WHAT STRATEGIES FOR WATER SAVINGS ?

REGARDS CROISÉS EUROPÉENS
SHARING EUROPEAN VIEWS



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PROJET COFINANCÉ PAR LE FONDS EUROPÉEN AGRICOLE POUR LE DÉVELOPPEMENT RURAL
L'EUROPE INVESTIT DANS LES ZONES RURALES



Irrigation in Italy



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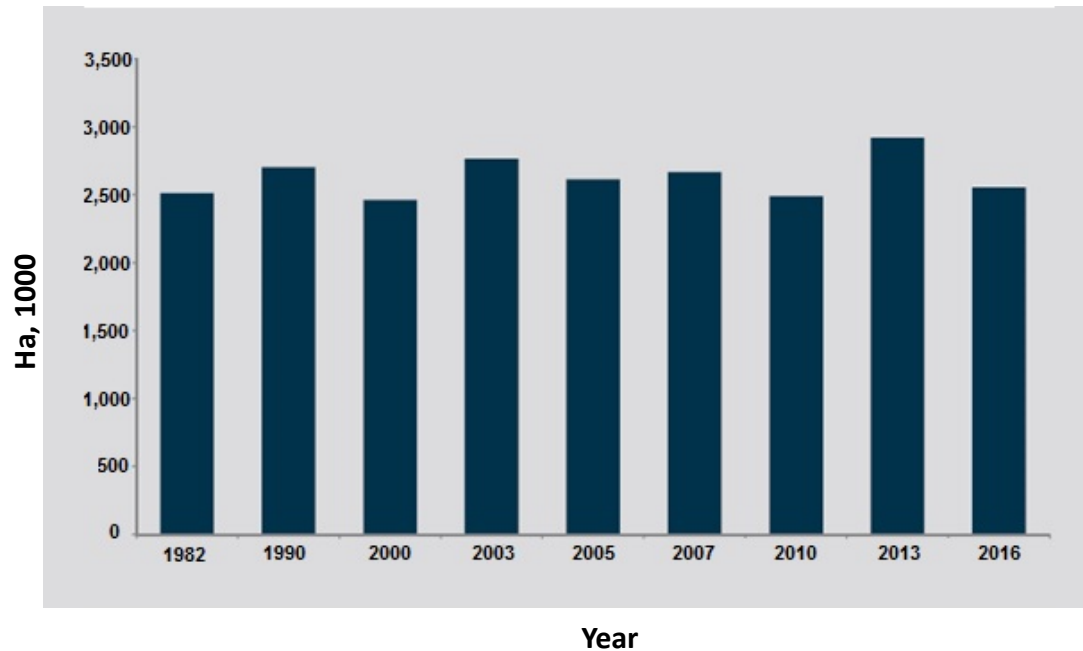
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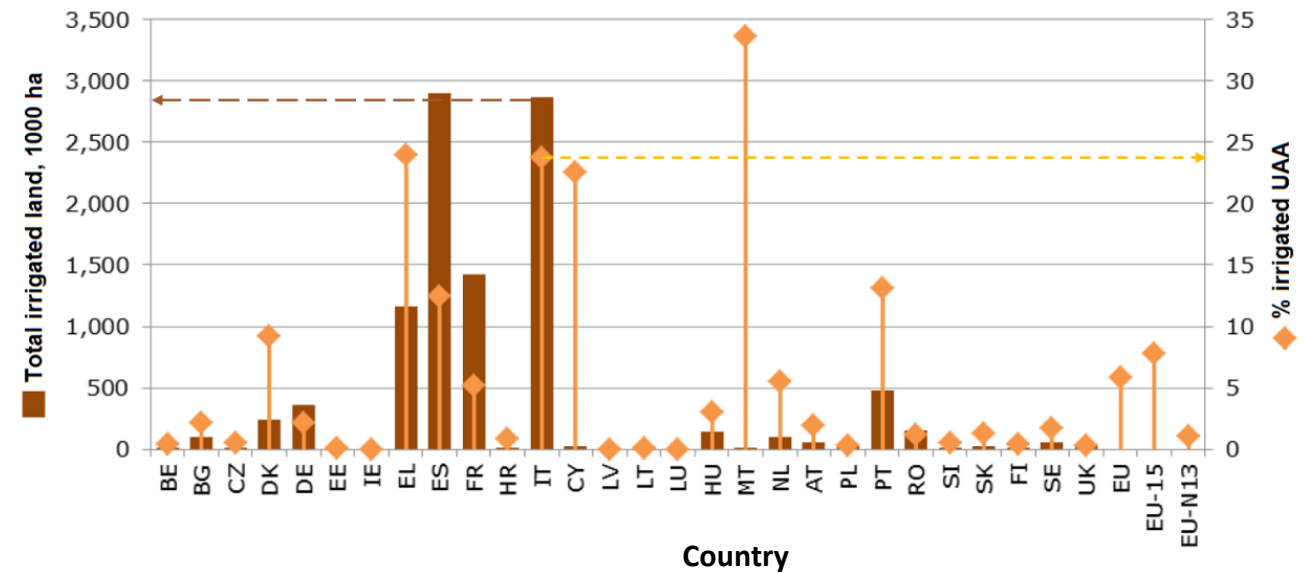
Irrigation in Italy during time and within EU28

During the last 35 years, irrigated land ranged between 2,5 to 2,9 Mha. On annual basis, irrigated land is affected by both climatic variations and cultivated crops



Source: Istat, 2019

After Spain, Italy is the EU Country with the largest irrigated area, corresponding to more than 20% the utilized agricultural area (UAA)

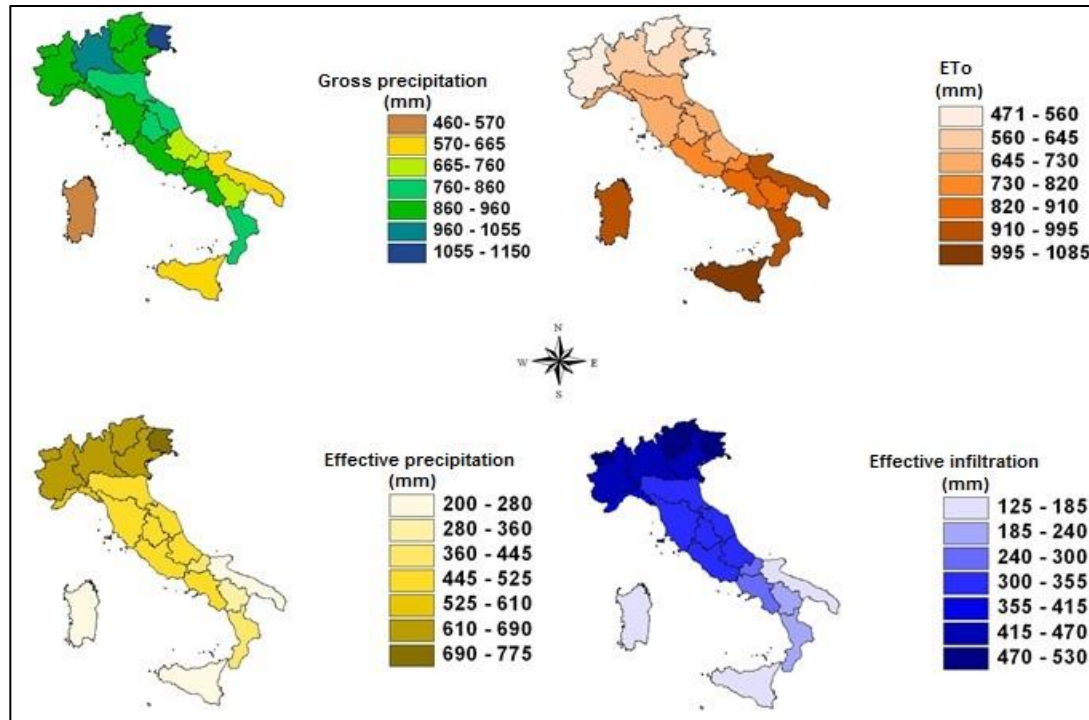


Source: https://ec.europa.eu/agriculture/cap-indicators/context/2017/c20_en.pdf, modif.



Water resources and irrigation statistics

Higher precipitation and lower climatic demand in the North. Prone to water scarcity the South



Source: ICID, 2006

Some recent statistics on irrigation

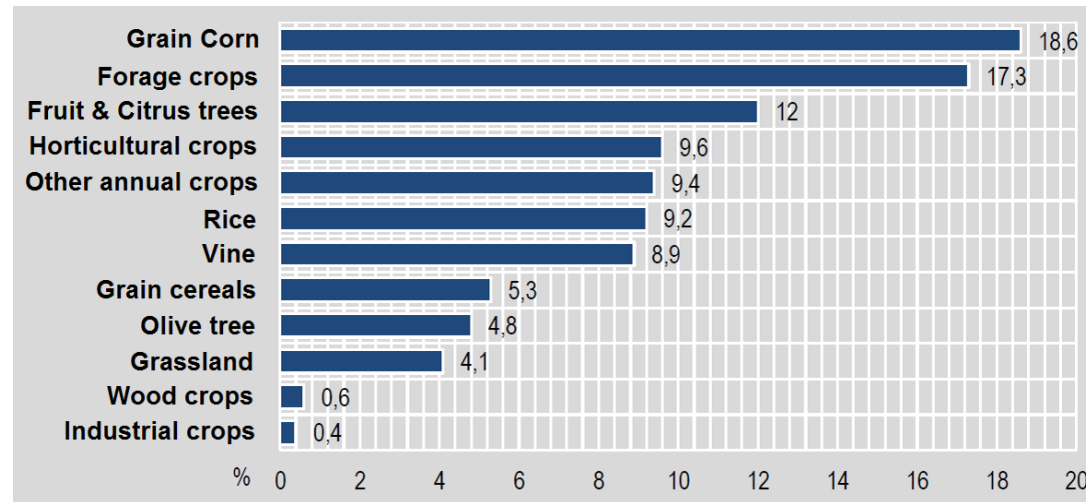
- Average Utilized Agricultural Area (UAA) is 11 ha/farm, more than doubled in the last 35 years due to total number of farms more than halved, and utilized land reduced by 21%
- During the same period, Irrigable Agricultural Area (IAA) increased by 4.2%
- Irrigation methods (% , m³/ha):
 - border+furrow: 30.9; 5,500 (2012)
 - basin: 9.1; 15,000 (2012)
 - sprinkler: 39.6; 3,500 (2012)
 - micro: 17.5; 3,000 (2012)
- Total applied volume: 11.6 BCM/yr (2012)
- Average applied volume: ~4,700 m³/ha (2012)
- Water allocated to Agriculture : ~50% the total withdrawal (2012)

Source: Istat

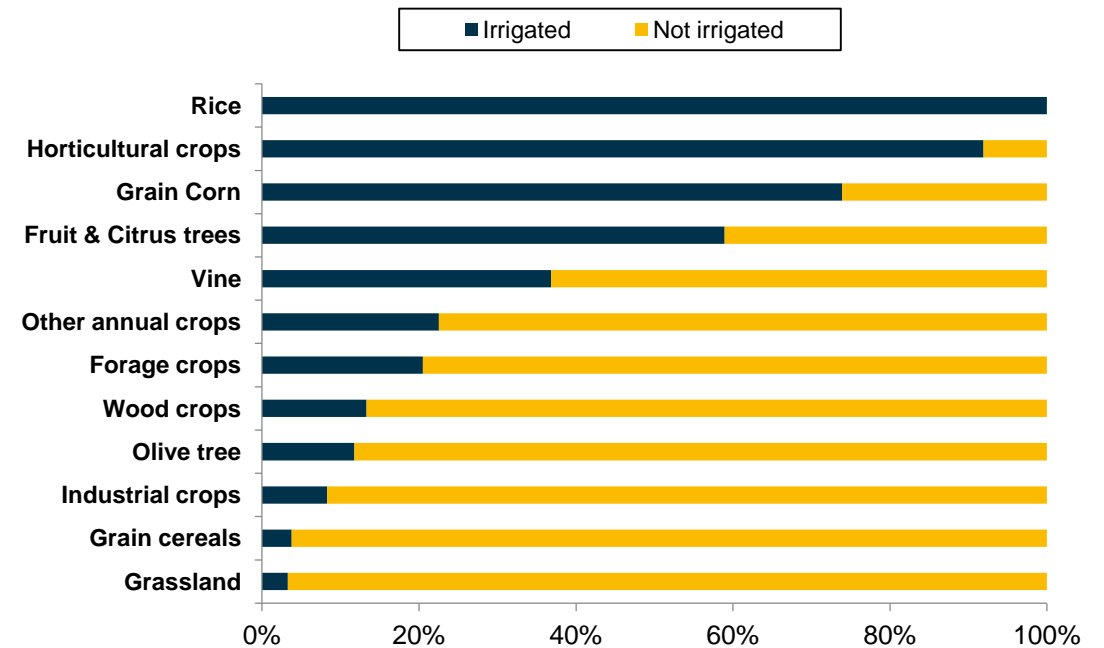


Crop type and irrigation

Share of total national irrigated area by crop type. Irrigated area of vine and orchards increased by more than 10% in the last 20 years (2016)



Share of cultivated area under irrigation by crop type. Only rice cultivated land is totally irrigated (2016)

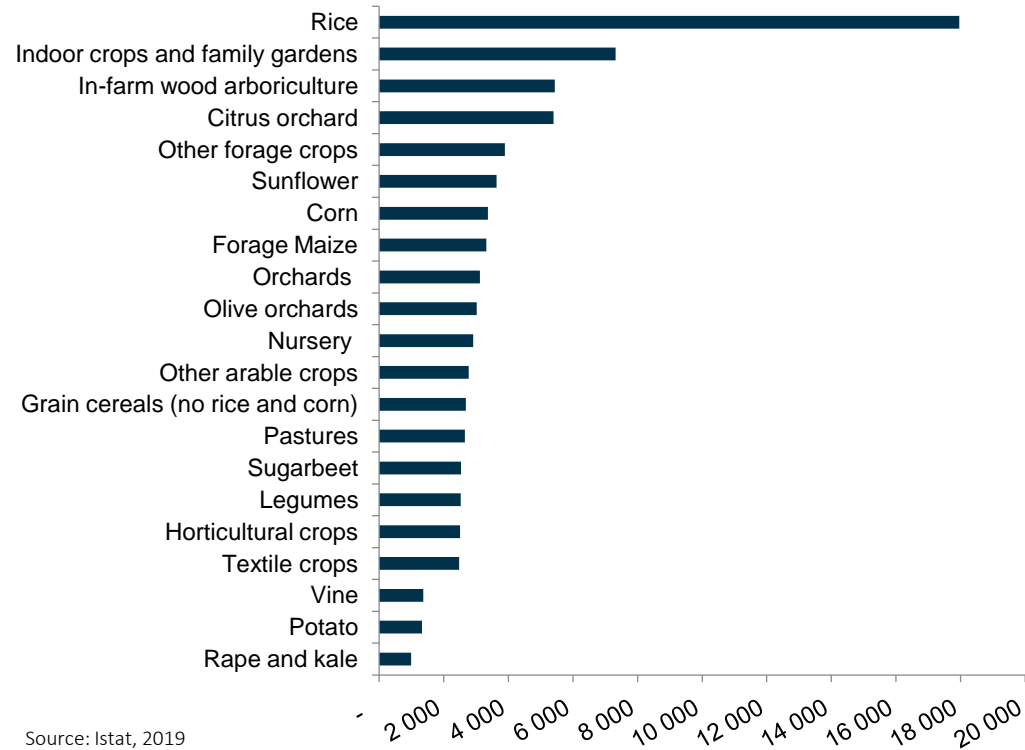


Source: Istat, 2019



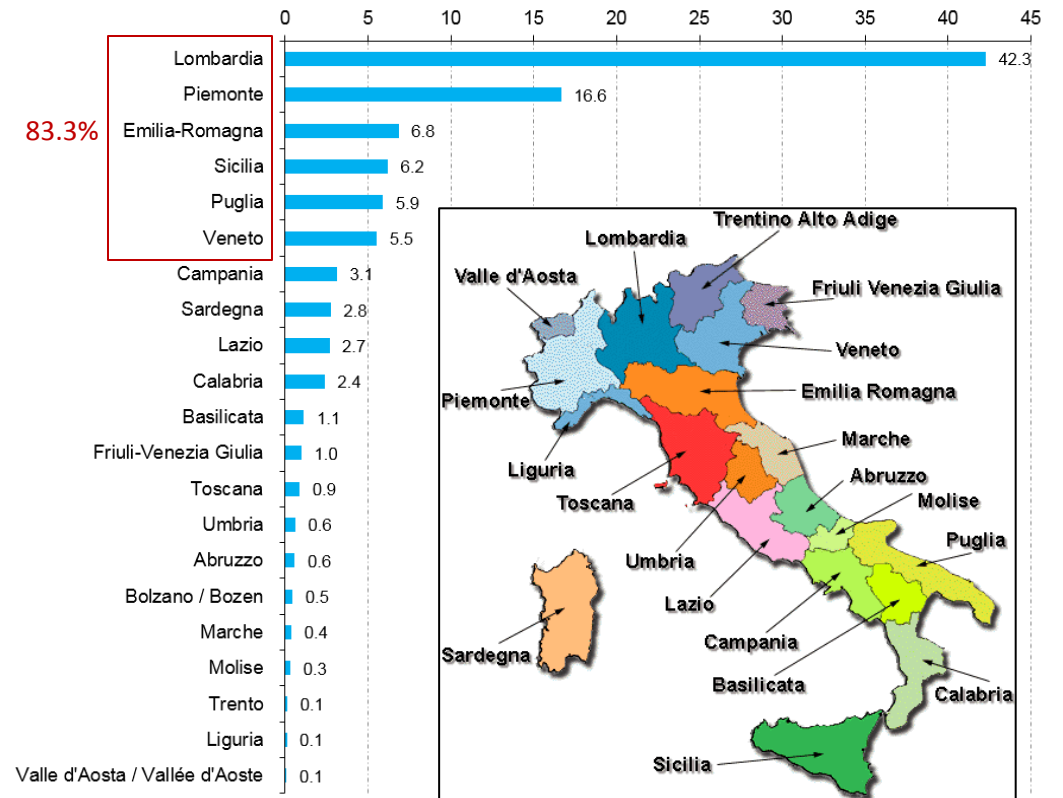
Applied irrigation water by crop type & Region

Average applied irrigation water (m³/ha) by crop type. Rice is by far the most exigent, and is typically cultivated in the North (2010)



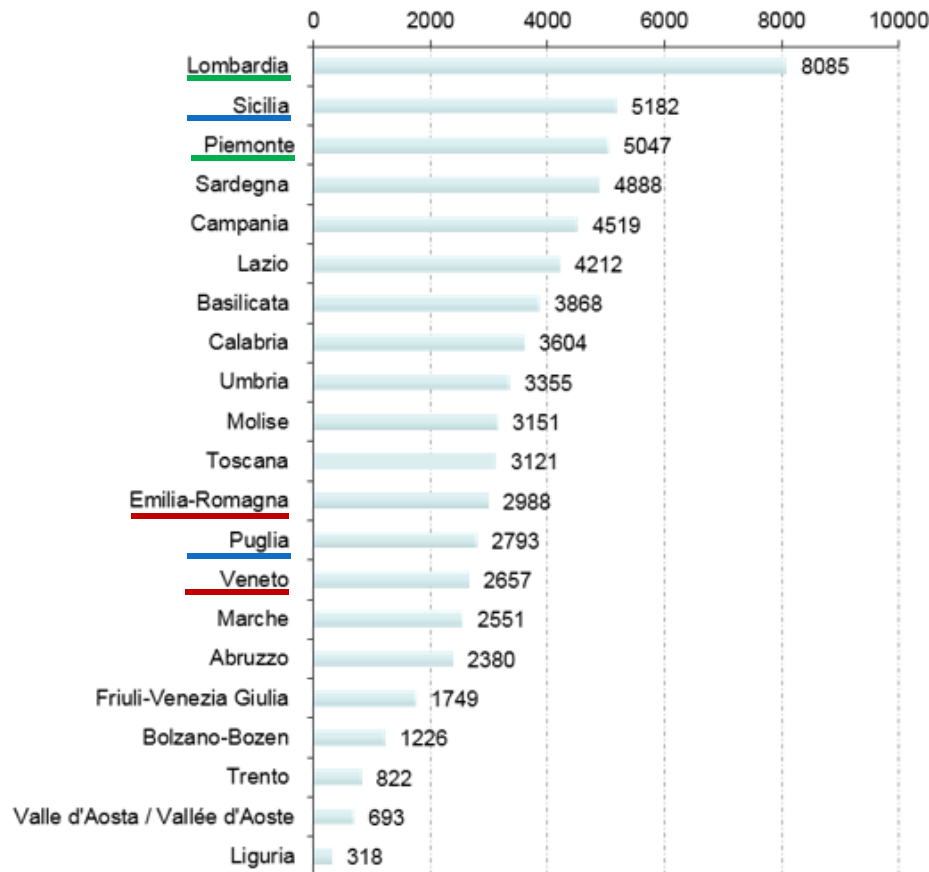
Source: Istat, 2019

Applied water by Region (% of the total national). Lombardia has also the largest irrigated land (20.0% of the national total)



Applied water by Region and share of methods in the 6 most irrigated Regions

Average applied water by Region (m³/ha)



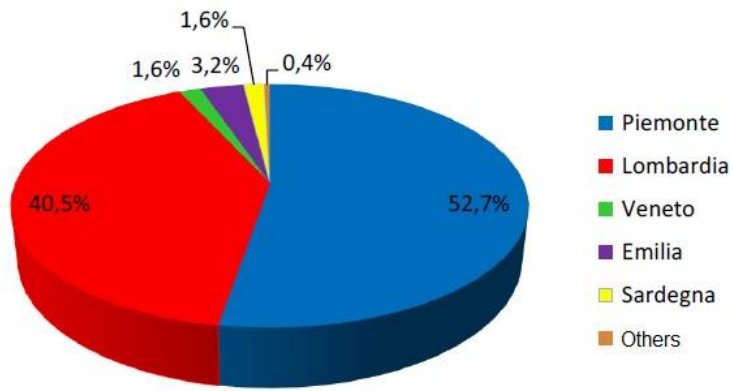
Share of irrigation methods in the top 6 irrigated Regions

Region	Irrigation method (% of regional irrigated area)		
	Surface	Sprinkler	Micro
Lombardia	80.4	18.2	1.4
Piemonte	93.3	4.9	1.8
Veneto	26.0	68.4	5.6
Emilia Romagna	18.9	61.5	19.7
Puglia	7.0	14.4	78.6
Sicilia	6.3	28.3	65.5



About efficiency at the field level

Basin-Rice cultivation



- Research on strategies to reduce the depth of water table at the beginning of the irrigation season (i.e., winter flooding).
- Agrarian landscape of rice cultivation is definitely modelled and characterized in Northern Italy, assigning that territory a cultural role within the context of national heritage.

Some value on pressurized methods

Irrigation type	Crop	Range (%)	Avg (%)	Publication
Micro	Annual & Perennial	44÷87	69.7	2006, ARSIA
Micro	Annual	50÷90	75.7	2012, ICID
Micro	Perennial	40÷93	74.6	2012, ICID
Sprinkler	Annual & Perennial	35÷71	58.1	2009, AIIA
Sprinkler	Annual	59÷88	78.4	2013, WIT
Micro	Annual	39÷81	63.2	2013, WIT



Towards water savings?

- Italian Government approved guidelines to quantify the irrigation volumes used, according to European directives (Decree of July 31, 2015). Implementation is in charge of individual Regions.
- Activity of Land Reclamation and Irrigation Consortia on the National territory can support the implementation of the Decree.
- At the time of the 6th General Census of Agriculture (Istat, 2012) estimated water saving allowed by irrigation advisory services (IAS) was about 10%.

Among available IAS today:

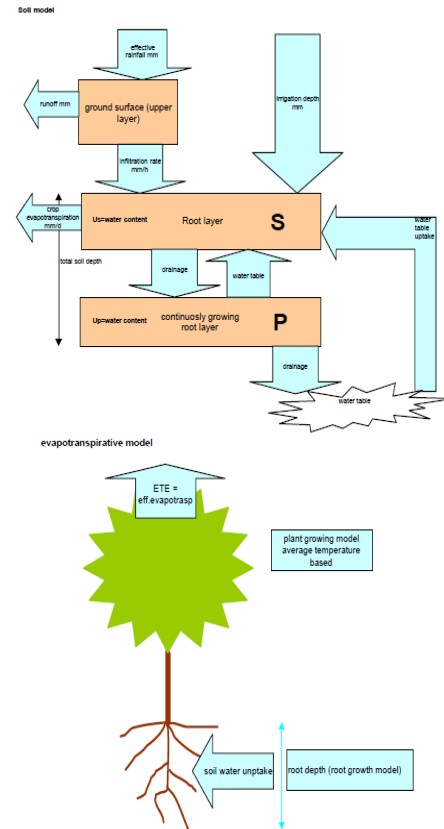


Towards water savings?

IRRINET by IRRIFRAME

IRRISAT

Is a software developed by the CER, based on a water balance model to assist farmers by providing real time irrigation scheduling. According to data provided by the National Association of Drainage and Irrigation Consortia (ANBI), allowed water saving is between 15 and 25%



Is based on high resolution satellite monitoring of canopy development. Provides farmers and water managers with real-time irrigation water needs from field and irrigation unit to district and river basin scale. According to data collected since 2007, allowed water saving is up to 30%



Source: https://www.irriframe.it/irriframe/Content/Irrinet_testo_documentazione_english_version.pdf

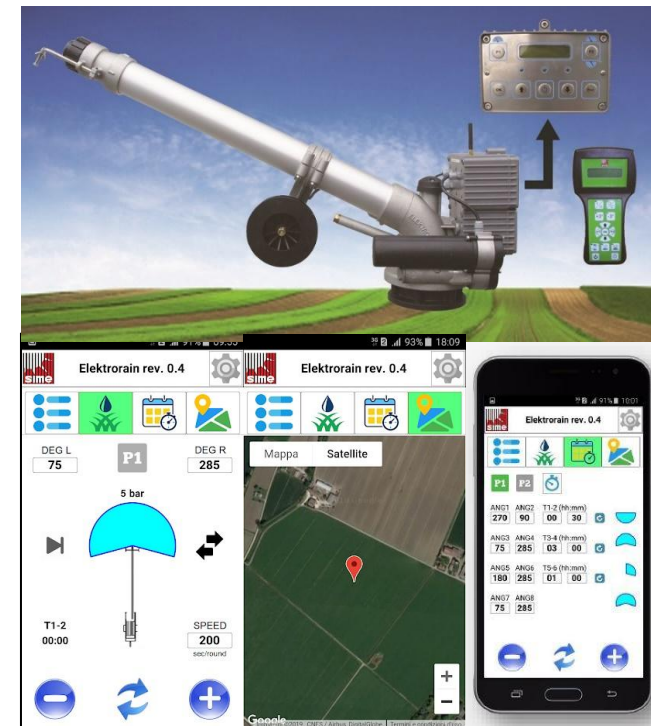
Source: <https://www.irrisat.com/en/farmer/>

Towards water savings?

Irrigation machines and equipment produced by national manufacturers make use of latest technology to increase overall irrigation performance



Integrated systems supported by monitored water balance and remote control of field operations, according to the so called *Digital Irrigation*



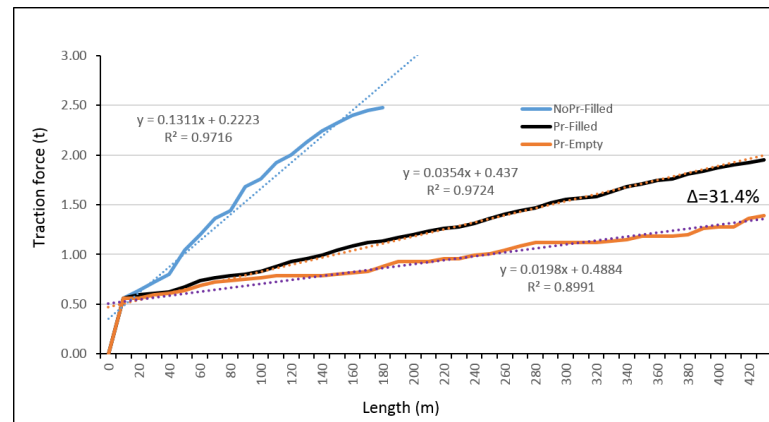
Gun sprinkler with remote control of operations and positioning in the field via GPS. Energy is self-produced



Towards water savings?



Device named *Protector* conceived to reduce energy consumption



Example of field test comparison on applied traction force using *Protector* (crop: Sugarbeet)

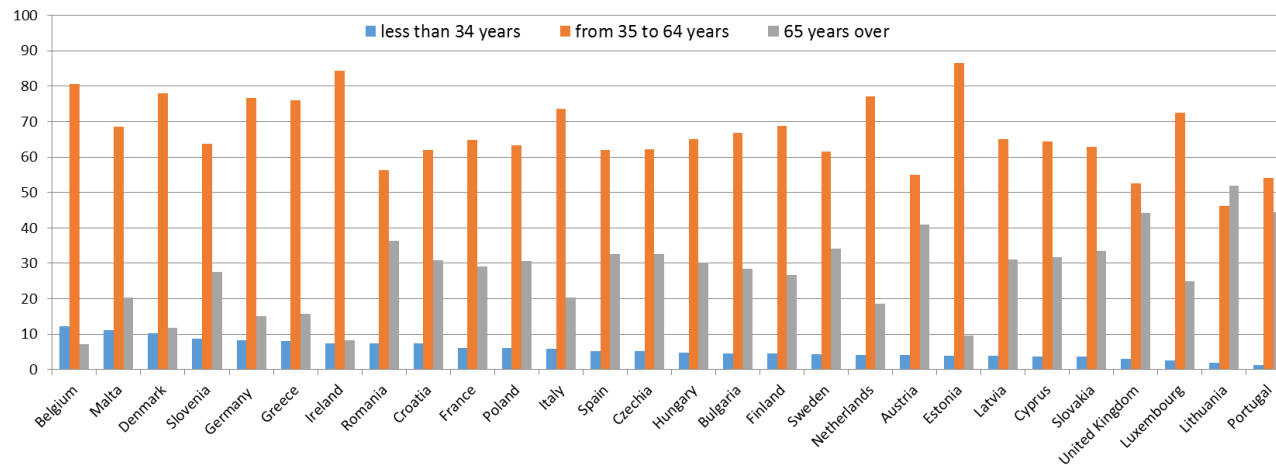
Actual and potential advantages

- ✓ applied traction force reduced;
- ✓ use of thinner hoses (same outer diameter given);
- ✓ duration of the hose;
- ✓ reduced stress on mechanical components;
- ✓ constant rewind speed;
- ✓ reduced GHG emission during both production and use phase up to 30%;
- ✓ lower expenses for water lifting;
- ✓ distribution uniformity not affected by irregular rewind.

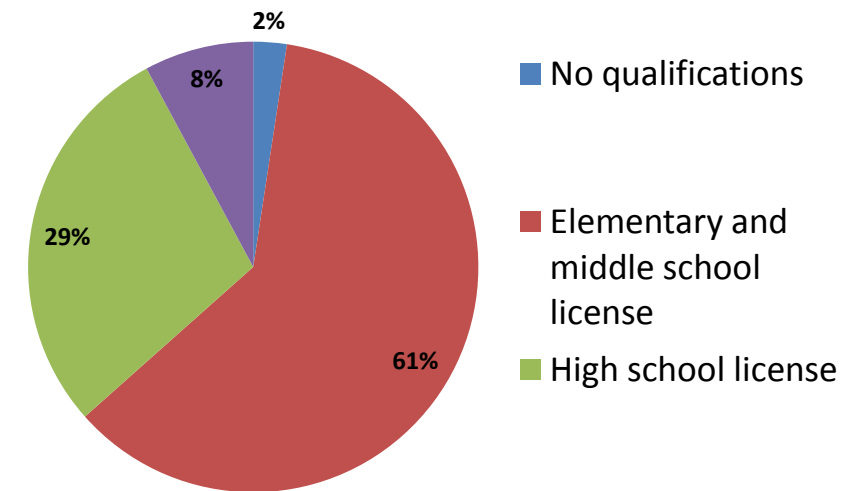


About farm management

Age of the farm manager, UE28 (2016)



Qualification of farm manager in Italy (2016)



In Italy, every 100 farms conducted by managers with 65 years or more, 10 farms are managed by farmers with less than 34 years

The education degree is growing over time



Conclusions

- A rather complete farm reorganization to optimize some agronomical practices, including irrigation, is in progress;
- Improving performance of irrigation equipment, as well as the support of irrigation advisory services, can led to significant savings of resources;
- Other conditions, such as increased farm size and the educational level of farm managers, can profitably support future challenges and get benefit from incoming opportunities.

