



Nuevos modelos en el cultivo del avellano: una mirada científica pensando en la eficiencia



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CONTENIDO

- 1.- Hacia el futuro: SES avellano*
- 2.-El contexto global*
- 3.- La evolución de costes e inputs*
- 4.- Sistemas en alta densidad: desarrollo y el porqué*
- 5.- Perspectivas y desafíos para una producción eficiente*



AGROMILLORA
It's in our nature

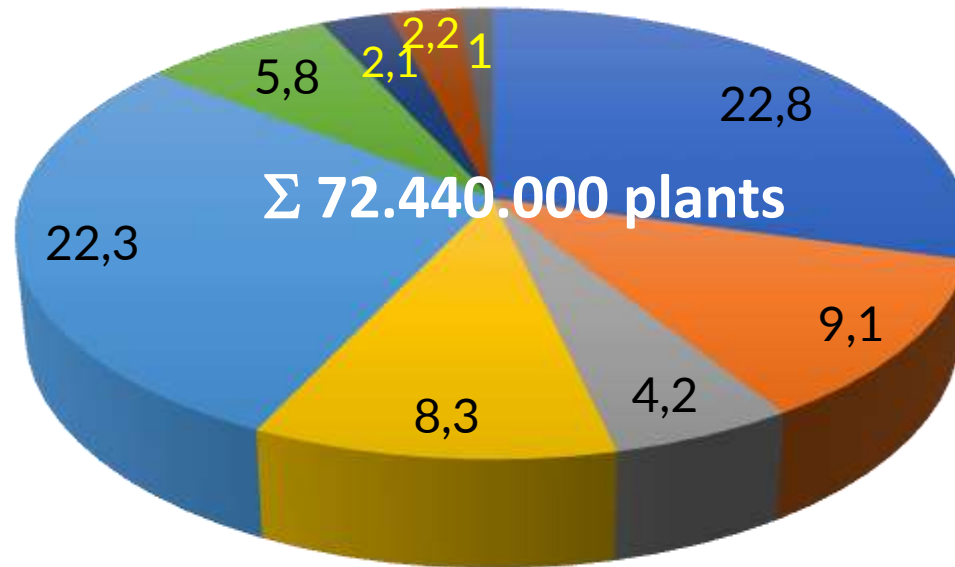
MULTINACIONAL única en el sector viverístico



AGROMILLORA

GLOBAL PRESENCE

MORE THAN
70M PLANTS
SOLD*



- | | |
|---------------------|----------------|
| ■ STONE FRUIT TREES | ■ ALMOND TREES |
| ■ APPLE TREES | ■ VINES |
| ■ OLIVE TREES | ■ BERRIES |
| ■ NUT TREES | ■ CITRUS |

*Sales per species 2020

Innovative Training Systems

OLIVE



ALMOND



APPLE



CITRUS



FRUIT TREES



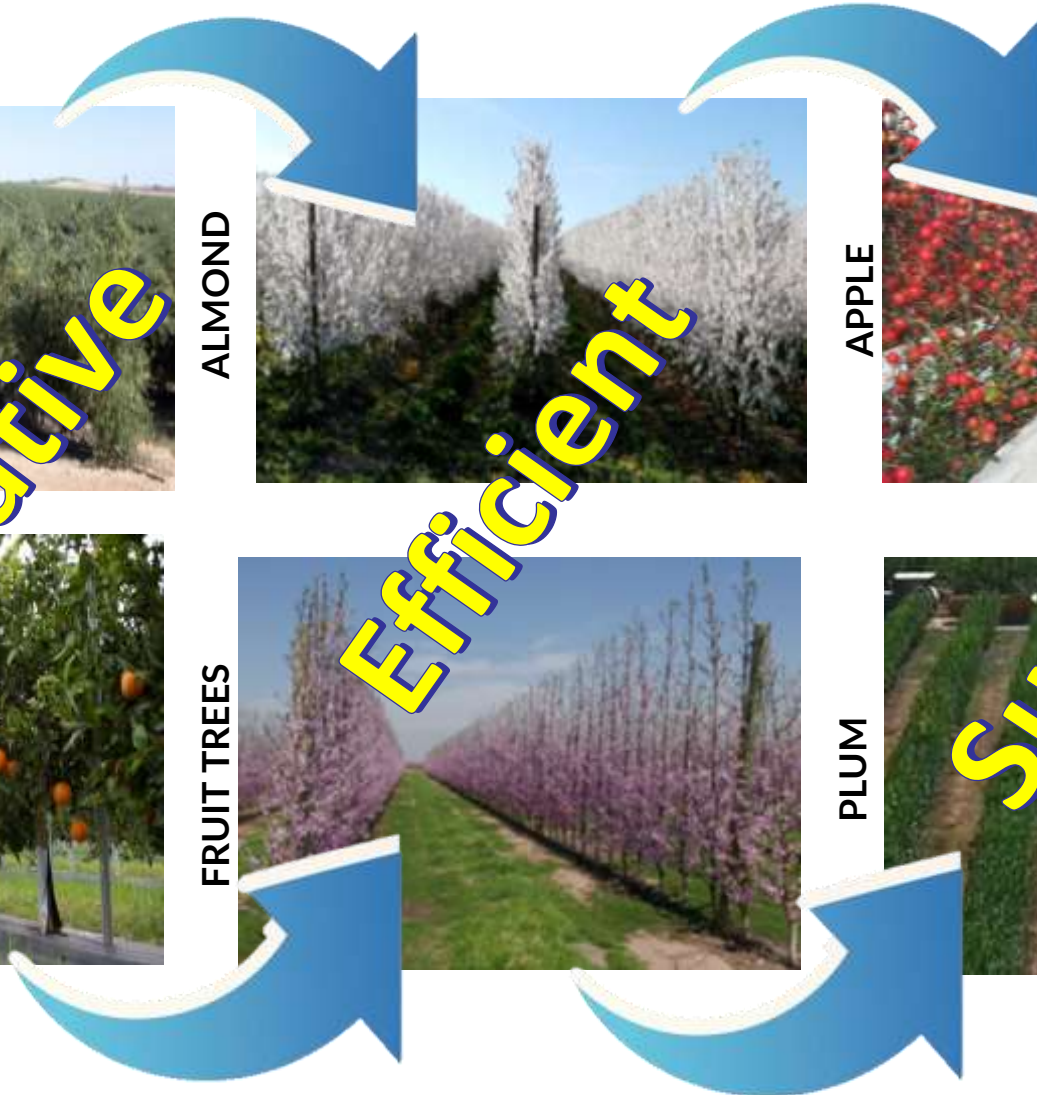
PLUM



Innovative

Efficient

Sustainable





Altissima densità o altissima sostenibilità?

Di **Salvatore Camposeo**

13 Gennaio 2020

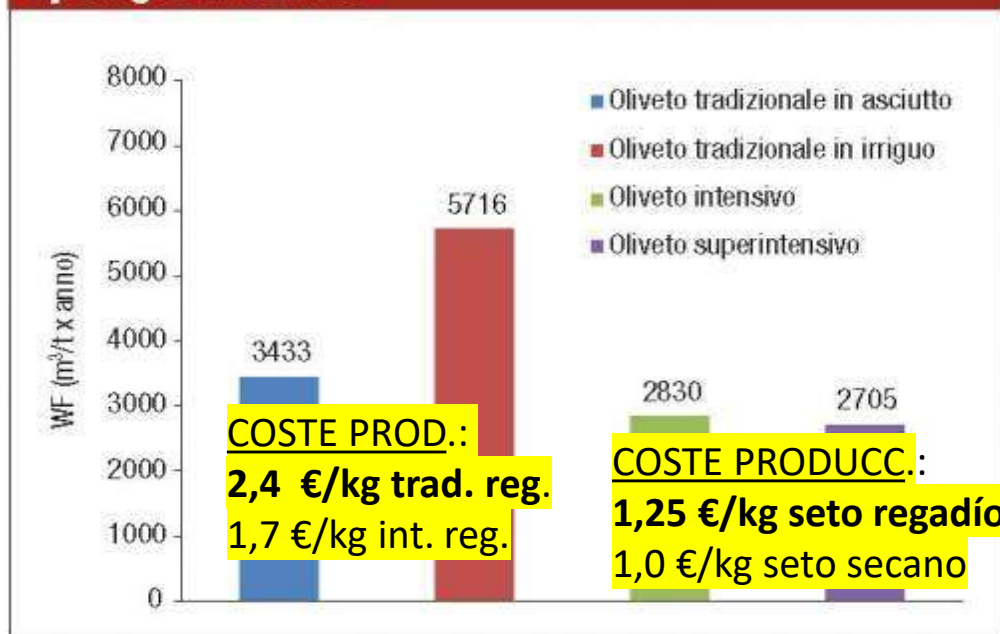
Dipartimento di Scienze Agro-Ambientali e Territoriali
Università degli Studi di Bari Aldo Moro

Olivo e Olio n. 1/2020



Prof. S. Camposeo

Grafico 1 - Impronta dell'acqua (WF) per diverse tipologie di oliveto (per ton. d'olio)



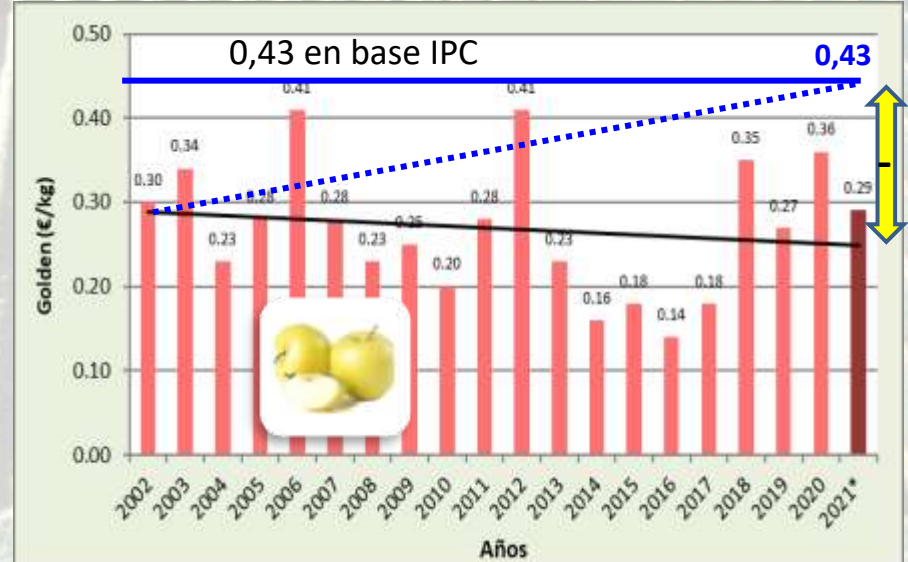
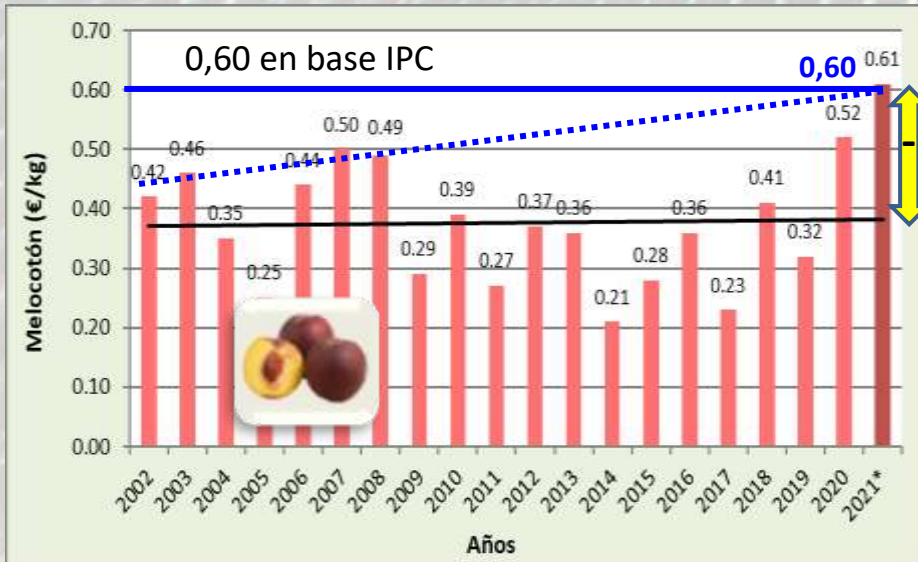
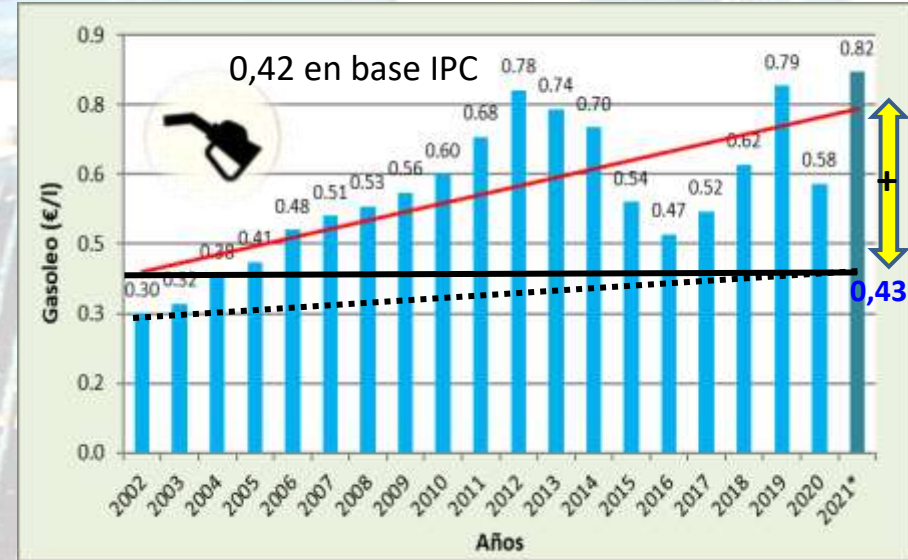
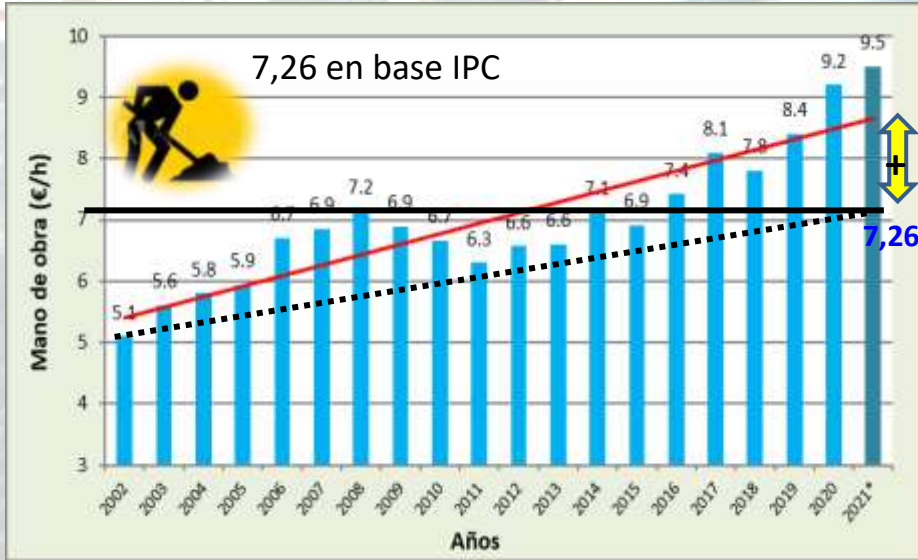
<https://olivoelio.edagricole.it/oliveto-e-frantoio/oliveto-superintensivo-altissima-densita-sostenibilita/>

Environmental sustainability by LCA analysis of different soil managements in a high-density olive orchard

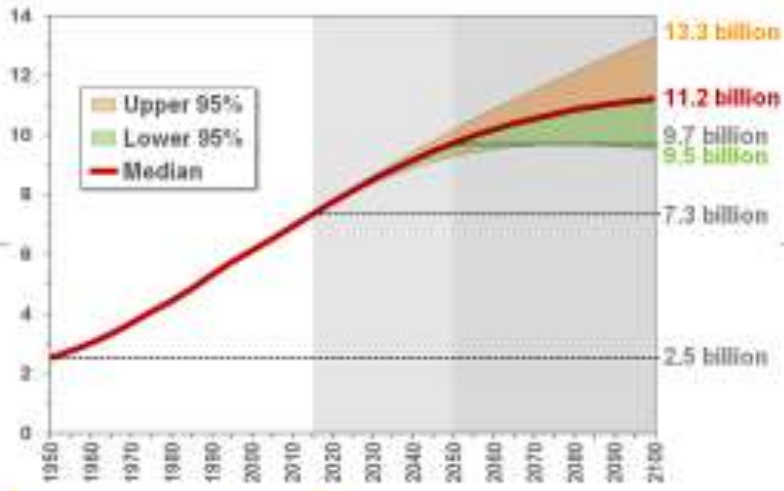
Giovanni Russo*, Gaetano A. Vivaldi, Bernardo C. De Gennaro, Salvatore Camposeo

Giovanni R*, Vivaldi, G.A., DE GENNARO, B.C., Camposeo, S. 2015. Environmental sustainability of different soil management techniques in a high-density olive orchard. DOI:10.1016/j.jclepro.2014.06.064. pp.498-508. In JOURNAL OF CLEANER PRODUCTION - ISSN:0959-6526 vol. 107

Evolution of prices of inputs, outputs and CPI* (IPC) in the period 2002-2021



WORLD POPULATION-2050



FOOD PRODUCTION



ENVIRONMENTAL SUSTAINABILITY



GROWERS PROFIT SUSTAINABILITY



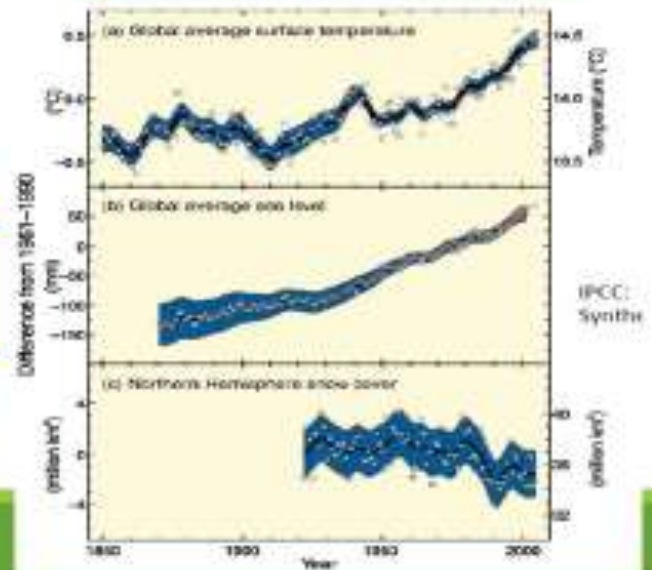
COSTS



EFFICIENT USE OF RESOURCES (INPUTS)

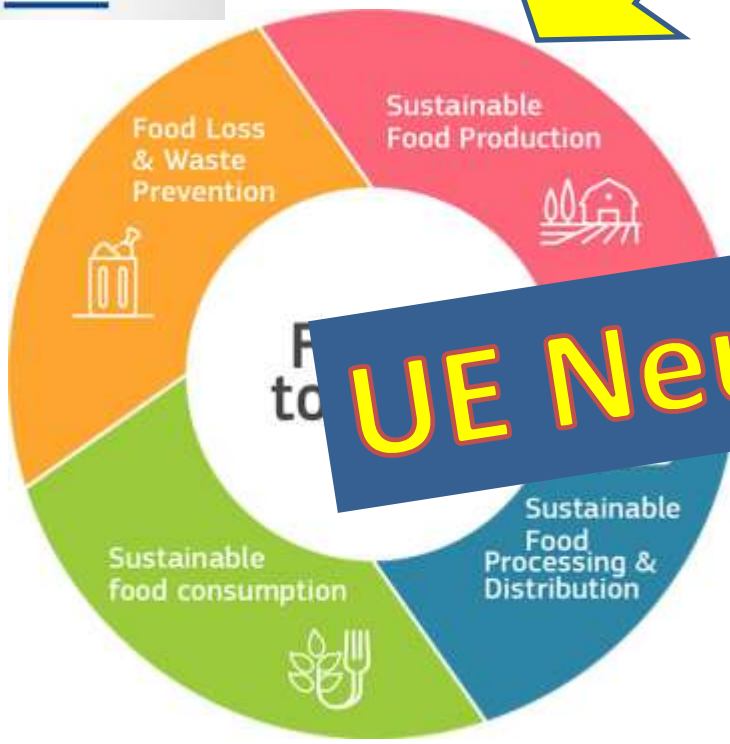


CLIMATE CHANGE



1

Farm to Fork Strategy – for a fair, healthy and environmentally-friendly food system



UE Neutral 2050

Reduction of PESTICIDES:
-50% in 2030, referred to 2020

FERTILIZERS:
-20% in 2030, referred to 2020

Increase of ORGANIC PRODUCTION:
from 9% cultivated Surface UE in 2020, to 25% in 2030.

FARM TO FORK STRATEGY: Is the translation of the EUROPEAN GREEN DEAL to EU AGRIFOD SYSTEM.

Proposes actions oriented to facilitate the transition towards a FOOD SYSTEM which:

- ✓ Sustainable at European scale: able to **reduce the environmental and climatic footprint**
- ✓ Monitoring for **food security**
- ✓ Guaranty the access to **healthy foods**

Three pillars for efficient & sustainable orchards

Variety &
Rootstock

Training systems &
canopy architecture

Production &
Technology



1

Breeding +
nursery prod.

2

Agronomical
models

3

Technology

TRANSICIÓN GENÉTICA HACIA PORTAINJERTOS Y VARIETADES DE BAJO VIGOR

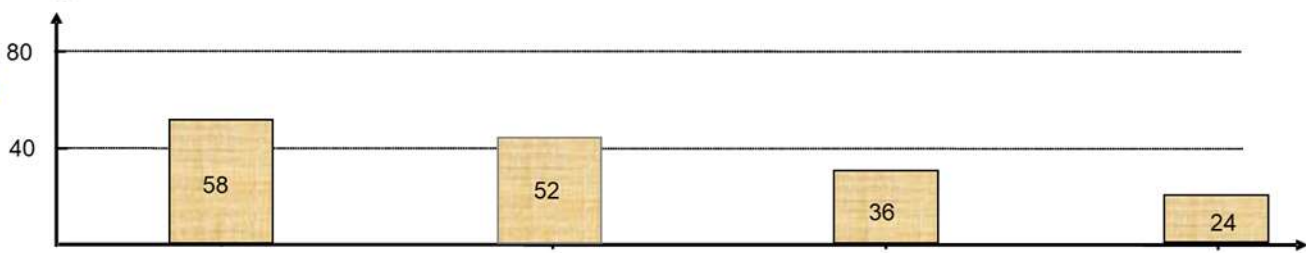


SPECIES	Very high	High	High-mid	Mid	Mid-low	Low
APPLE	Franco, M-25	M-4, M-793, MM-111	M-7, MM-106 G-257, G-969	M-26 G-41, G-213	M-9 EMLA o NAKB G-11	M-27, B-9 G-65
PEAR	Kirschensaler, BP-3, OHF-93	OHF-87, BP-1 Fox-9	BA-29 Pyrodwarf	M-A	M-H	M-C
PEACH	GF-677 Garnen Nemaguard Atlas	Montclar, GF-305 Cadaman Lovell, Kuban	Rootpac-R Tetra Penta	Adesoto-101 Rootpac-40 Isthara, Controller-6?	Rootpac-20 MP-29?	
CHERRY	F-12/1, Colt Sta. Lucia (SL-64)	Adara, Maxma-14 Gisela 12, PI-KU 1	Gisela-6 Weiroot-158	Gisela 5 Clinton	Gisela-3, Lake Cass, Crawford	Clare Damil
ABRICOT	Franco albaicoquero	Mirobolan 29C	Montclar, GF-305 AP-65	Adesoto-101 Isthara		
EUROPAN PLUM JAPANEES PLUM	Marianna 2624 Marianna GF 8/1	Mirobolan 29C Adara	Rootpac-R Tetra Penta	Isthara Adesoto-101 Miral 3278- AD	Rootpac-20	

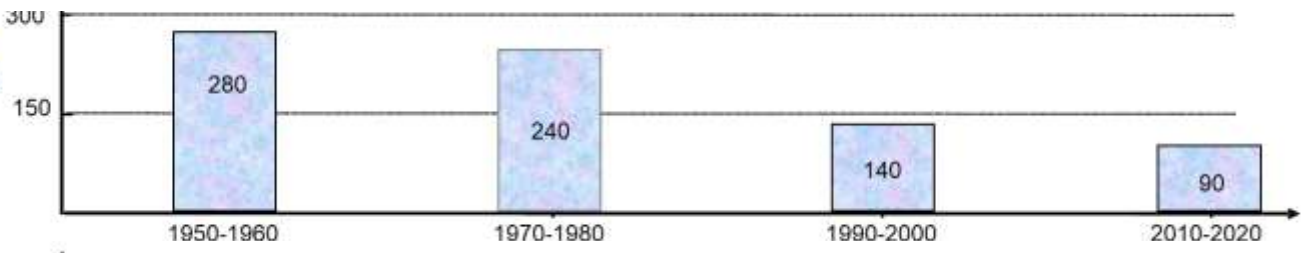
Transition to small trees = sustainable intensification



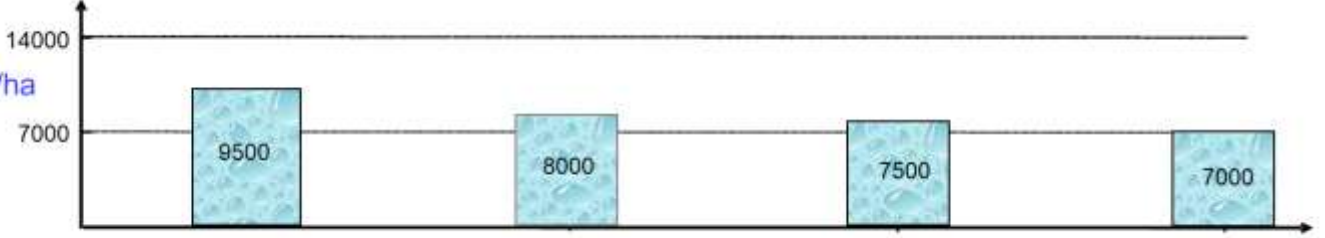
Deriva (%)



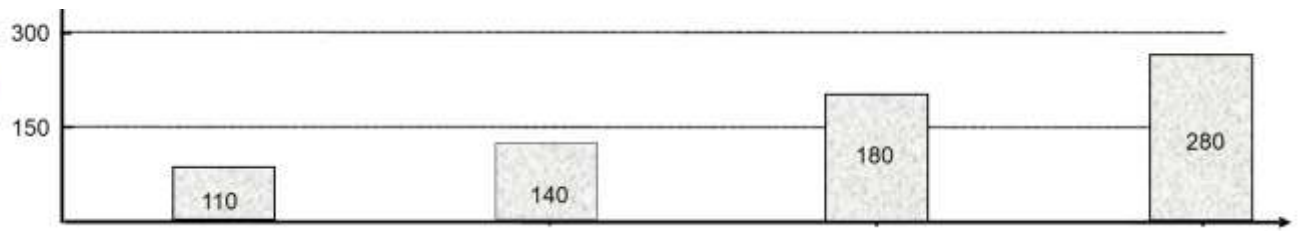
UF N/ha



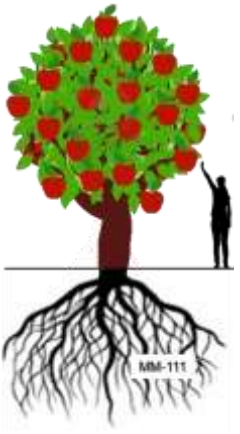
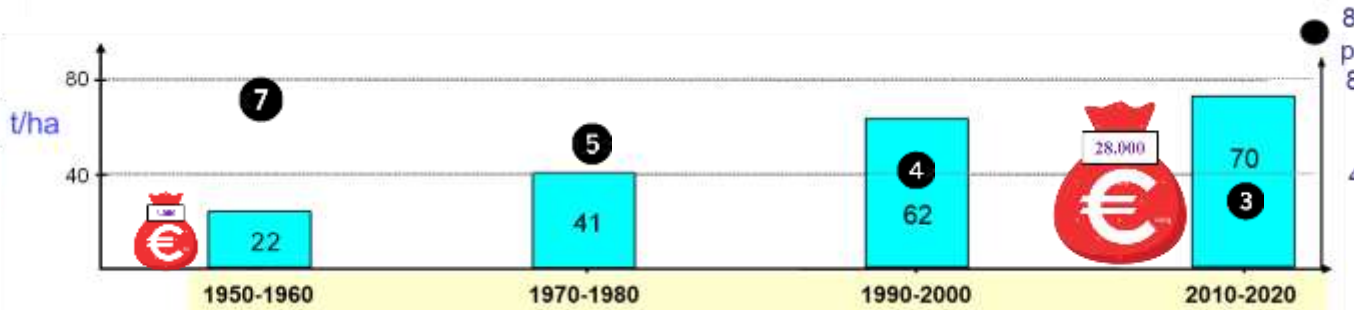
m³/ha



kg/h



t/ha



333 tre./ha

2D

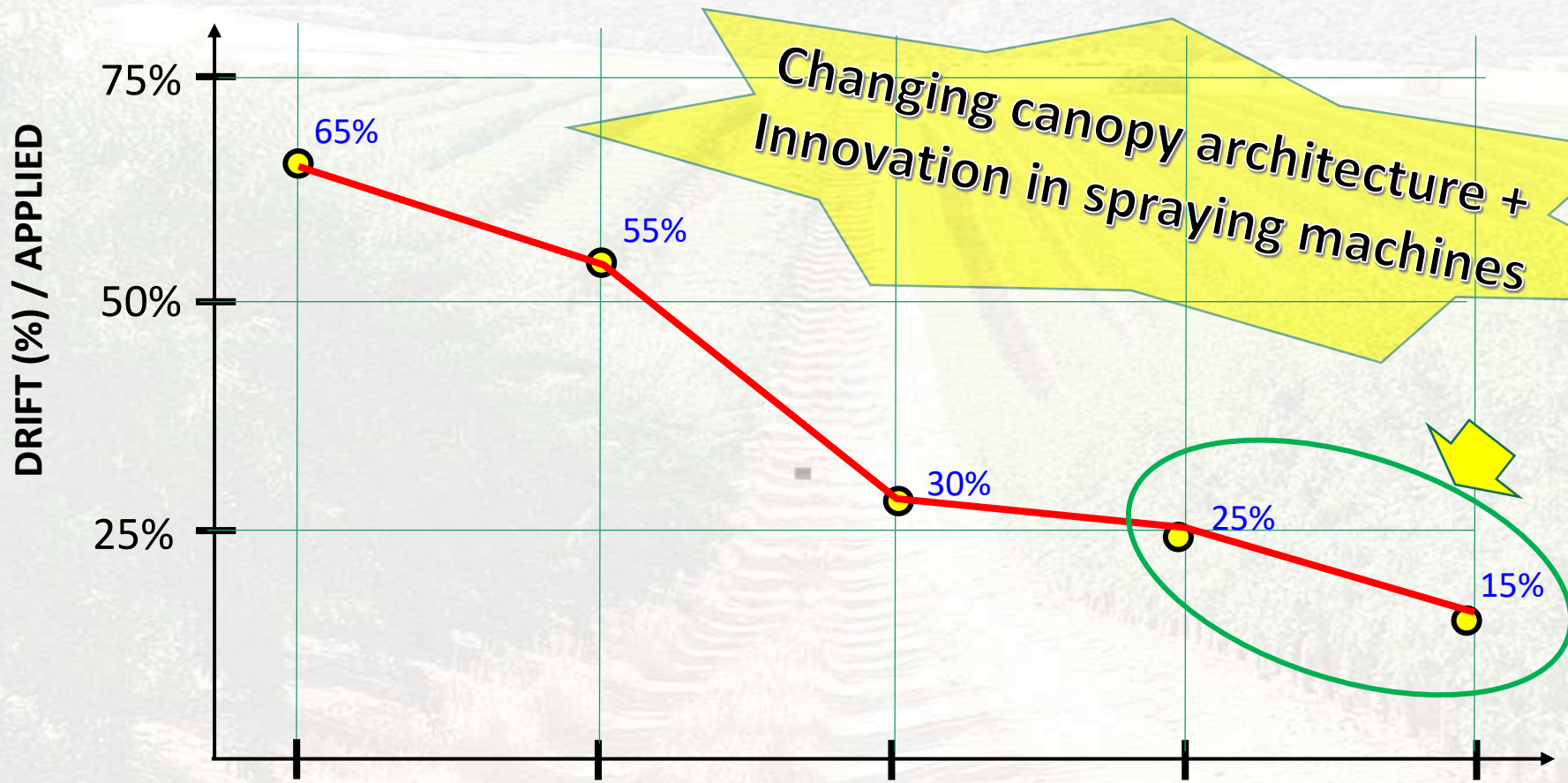


2,857 tre./ha

... CONTINUOUS IMPROVEMENT OF PESTICIDES APPLICATION



DRIFT (%) AFFECTED BY THE TRAINING SYSTEM AND SPRAYING EQUIPMENT

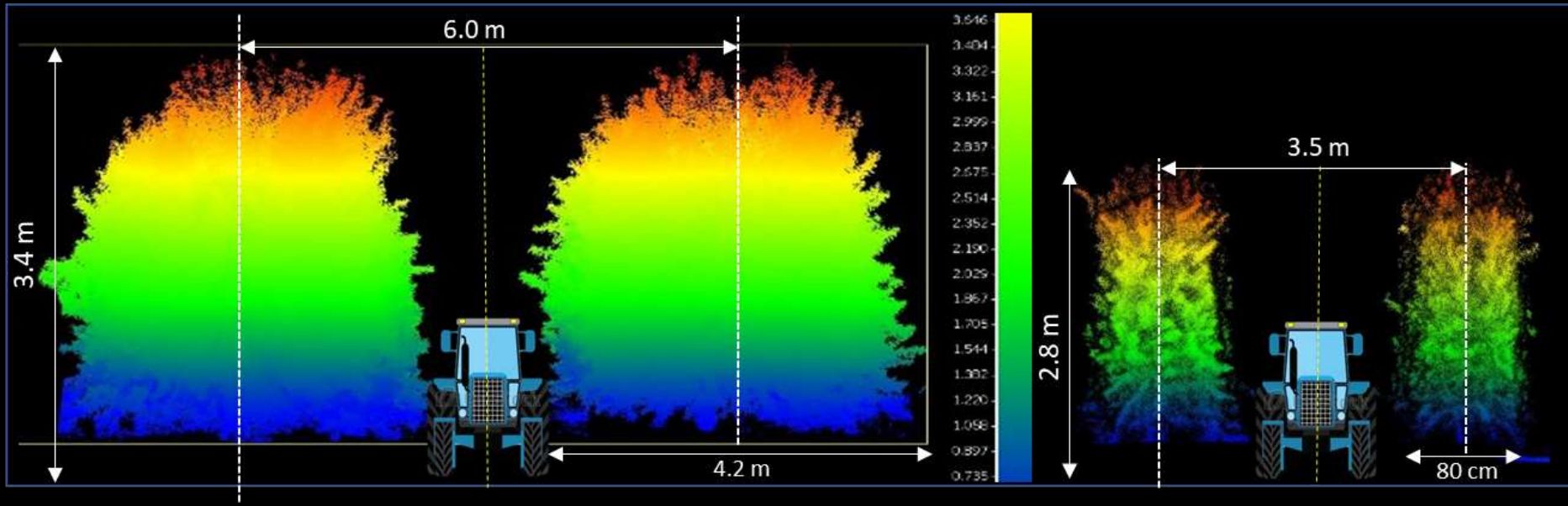




Super High Density (SHD) almond 3.5 x 1.2 m



EFFICIENCY OF TREATMENTS (2020 trial)



**PRELIMINAR
DATA 2020**

FACTOR	INTENSIVE	SHD
Canopy vol. (m ³ /ha)	11,200	5,867
Volum applied (l/ha)	1,100	700
Leaf deposition (%)	52%	64%
Drift (%)	31%	18%
Cost treatments (€/year)	924	689

PLUM in SHD (industry/fresh): Peralillo, O'Higgins



D'AGEN/RP-20: 3,5 x 1,5 m (1.905 trees/ha), 4th year

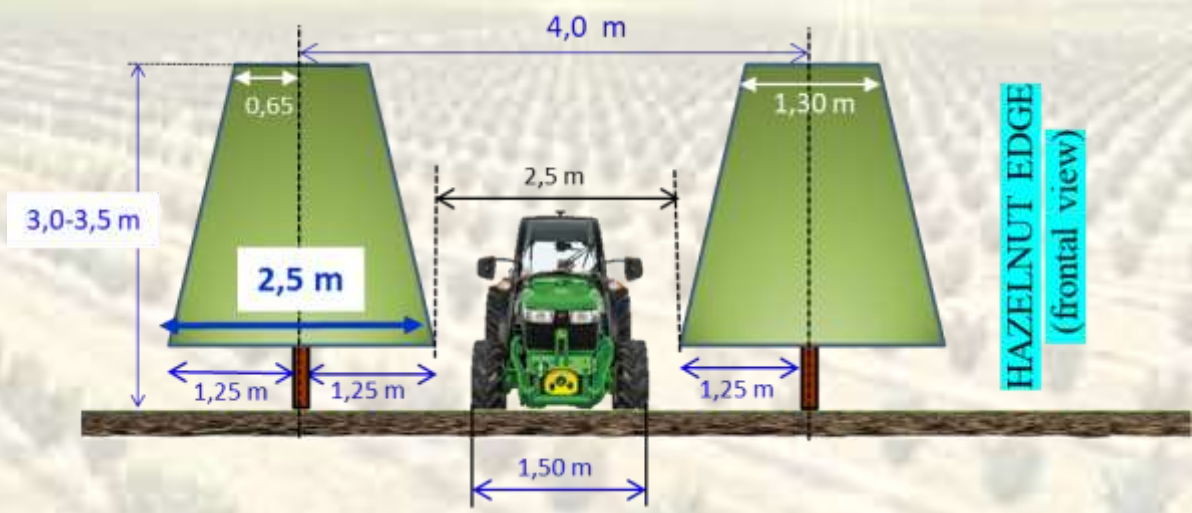
14 ene.- 2019



28 ene.- 2018



Propuesta avellano en alta densidad



NO PRUNING



PRUNING



1 YEAR LATER



MECHANICAL PRUNING IN ADULT ORCHARDS IN SPAIN



BEFORE PRUNING



AFTER PRUNING





NEW PLANTINGS IN OREGON (5 x 3 m)



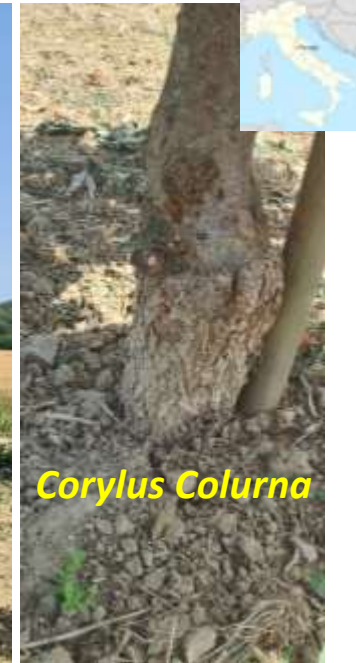
Intensification in progres all around



2nd year: 4,5 x 3,5 m



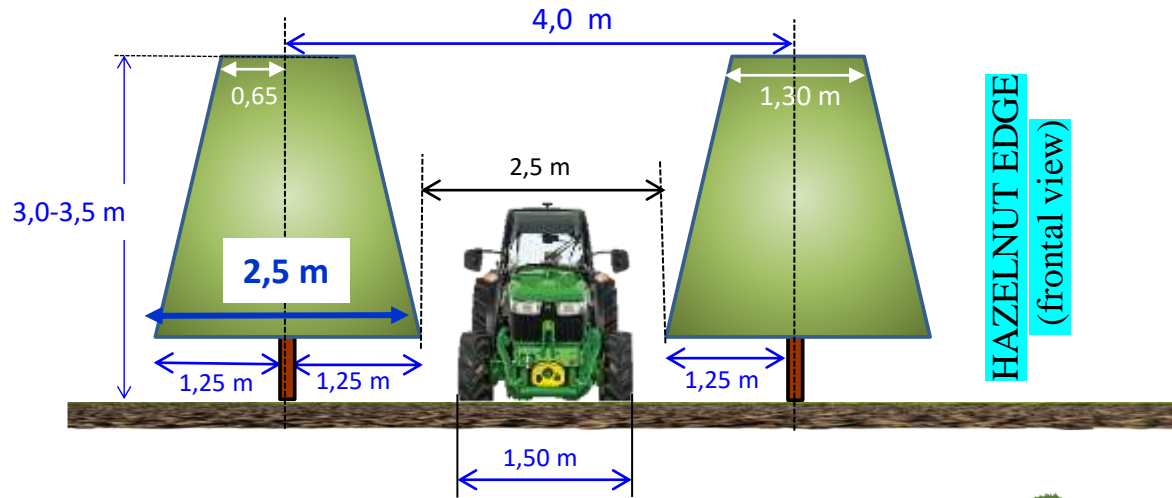
4th year: 5 x 3 m



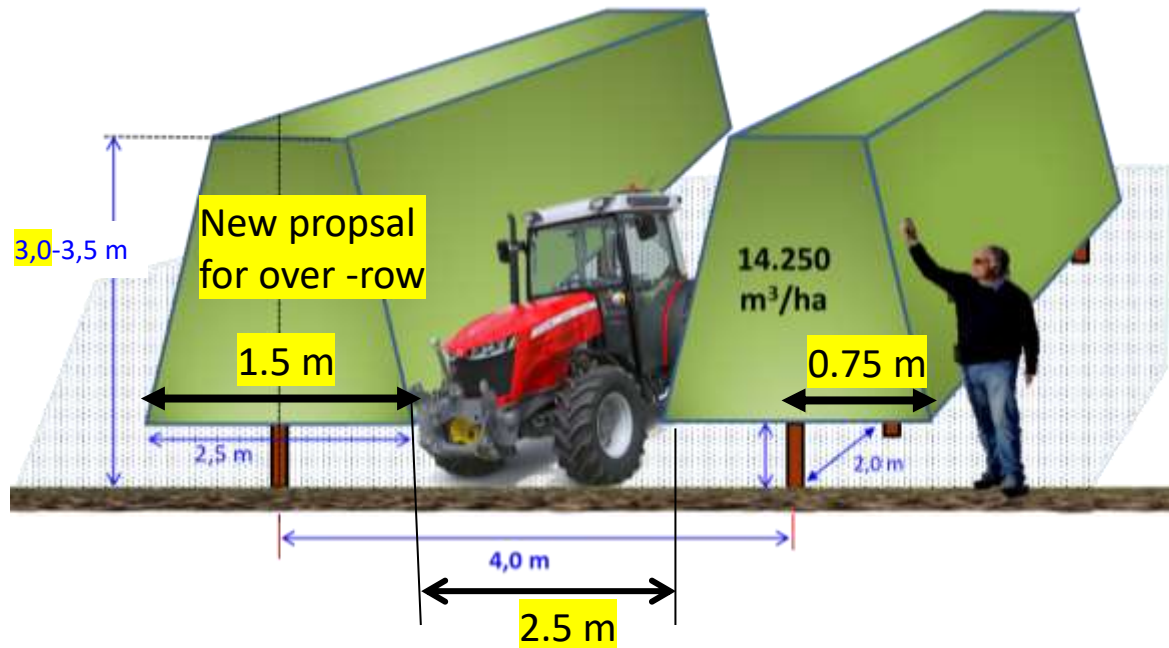
Corylus Colurna

11th Aug. 2021

NEW PROPOSAL OF MID DENSITY (MD) SYSTEM

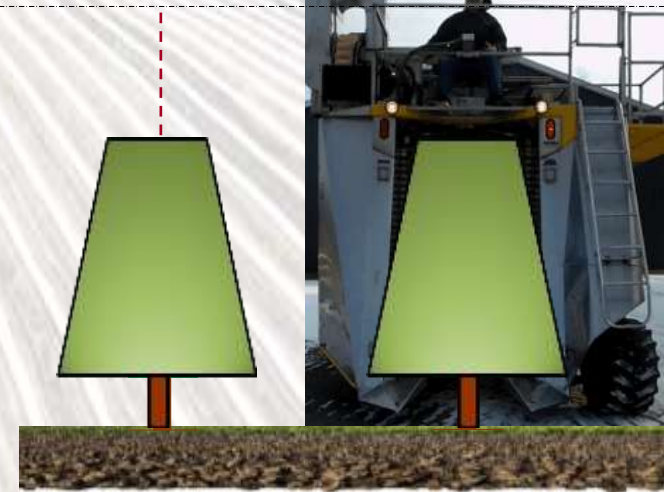
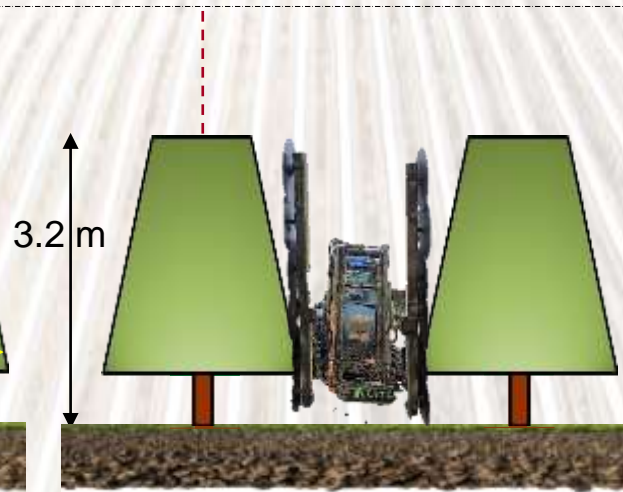
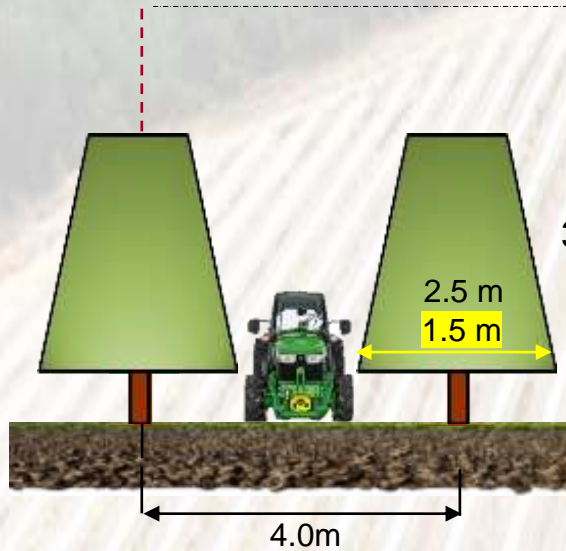


HAZELNUT EDGE (lateral view)



Iglesias, I., 2020. El Avellano: situación actual y nueva propuesta productiva en alta densidad. Revista de Fruticultura, 75, 6-51

ORCHARD DESIGN AND MECHANIZATION OF THE MAIN LABOURS SPACING 4 x 2 m





2nd year 3,5 x 1,5 m



27 agost.-2019



Green
pruning
2nd year
(2021)



25 octu. 2021

TRAINING 2 YEAR OLD TREES: PRUNING FOR OPTIMUM LIGHT DISTRIBUTION INSIDE THE CANOPY



2 years (before)



2 years (after pruning)



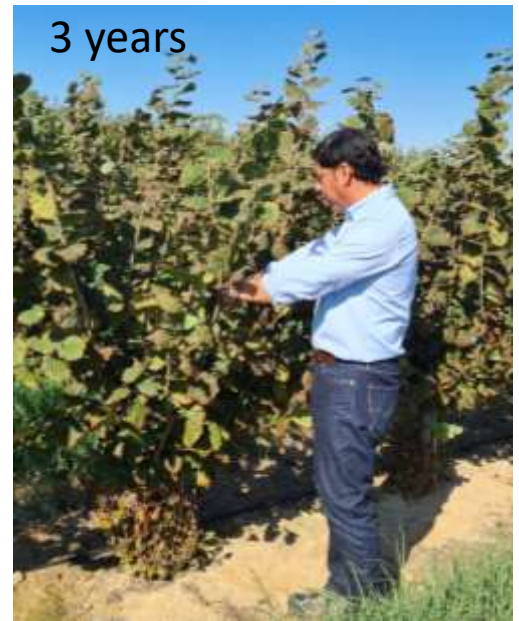


4 years



TRAINING TREES 1-4 years

3 years



15 octu. 2021

2 years (before)



2 years (after pruning)



1 year (before)





4 years (YAMHILL)



TRAINING TREES 2-4 years

4 years (TETHA)



7 Febre. 2022



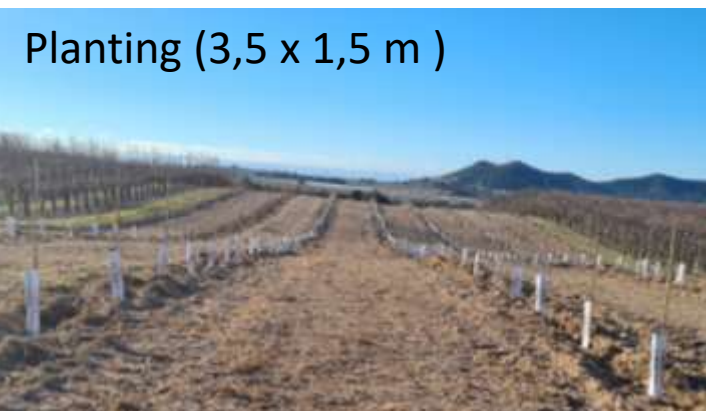
3 years (BCN)



2 years (BCN)



Planting (3,5 x 1,5 m)





TRAINING TREES 5 years

5 years (JEFFERSON)



5 years (SACAJAWEA)



7 Febre. 2022



6 years (GIFFONI)



TRAINING TREES 6 years



6 years (BCN)



7 Febre. 2022

TOPPING & HEDGING HAZELNUTS (3,5 x 1.5 m)



4th year

MAY 2020

6th year

GIFFONI: 3,5 x 1,2 m poda invierno

5 YEARS



Giffoni

20 ene.- 2021



GIFFONI 6^o verde 3,5 x 1,2 m



12 juli. 2021

GIFFONI 6 verd



6º verde

PAUETET 6 verd



Barcelona 6 verd



Jefferson 5 verd



12 juli. 2021

TRAINING TREES 6 years

6º verde



GIFFONI

1 Març. 2022



5º verde



18 Oct. 2021

GIFFONI in HD: Porxina (SPAIN) 3,5 x 1,2 m



6º verde

12 jun. 2021

SOLETA/RP-20 4th LEAF at 3.20 x 1.25 m



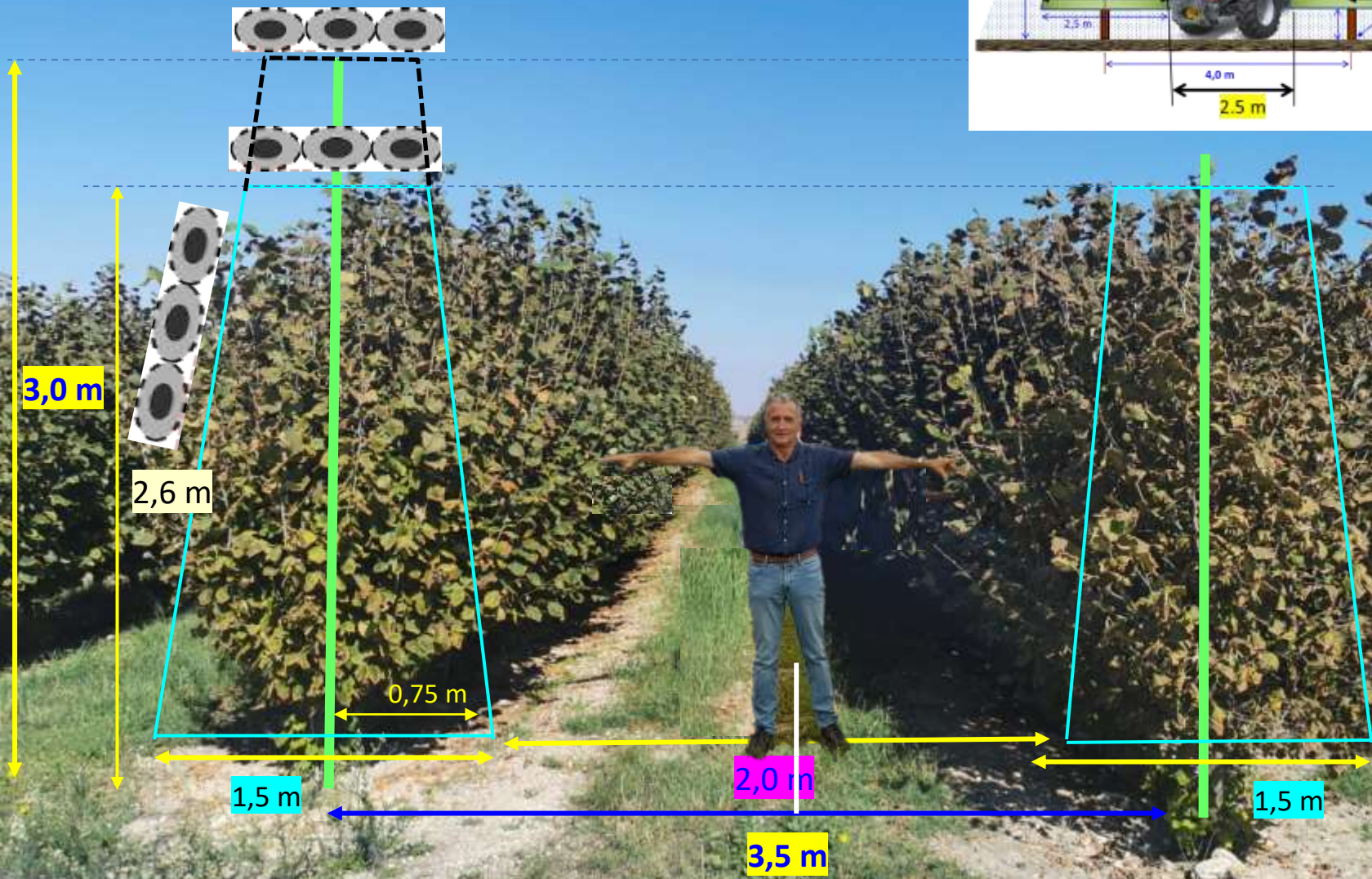
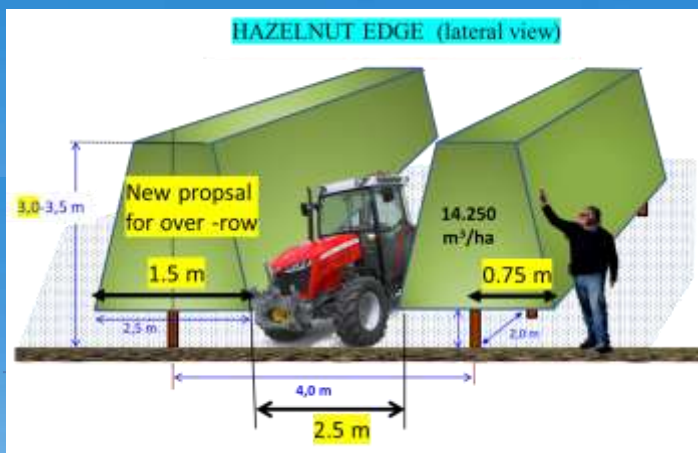
4th year



13 May.-2020



JEFFERSON 5^o verde 3,5 x 1,5 m



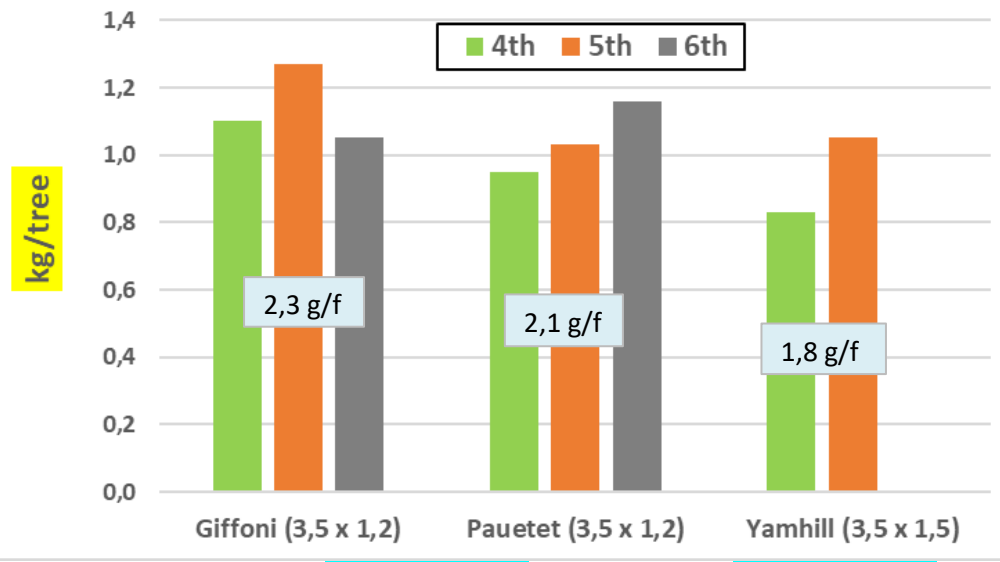


YIELD AND QUALITY in HD: Porxina-Mequinenza (SPAIN) 3,5 x 1,2 m

4th (2019), 5th (2020), 6th (2021)



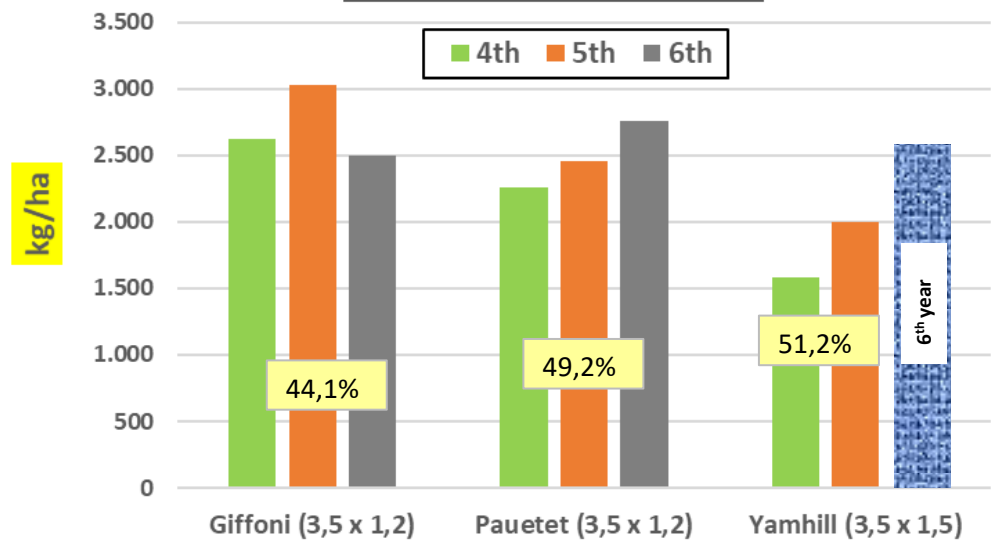
Annual Yields and fruit weight



2,381 tres/ha

1,905 tres/ha

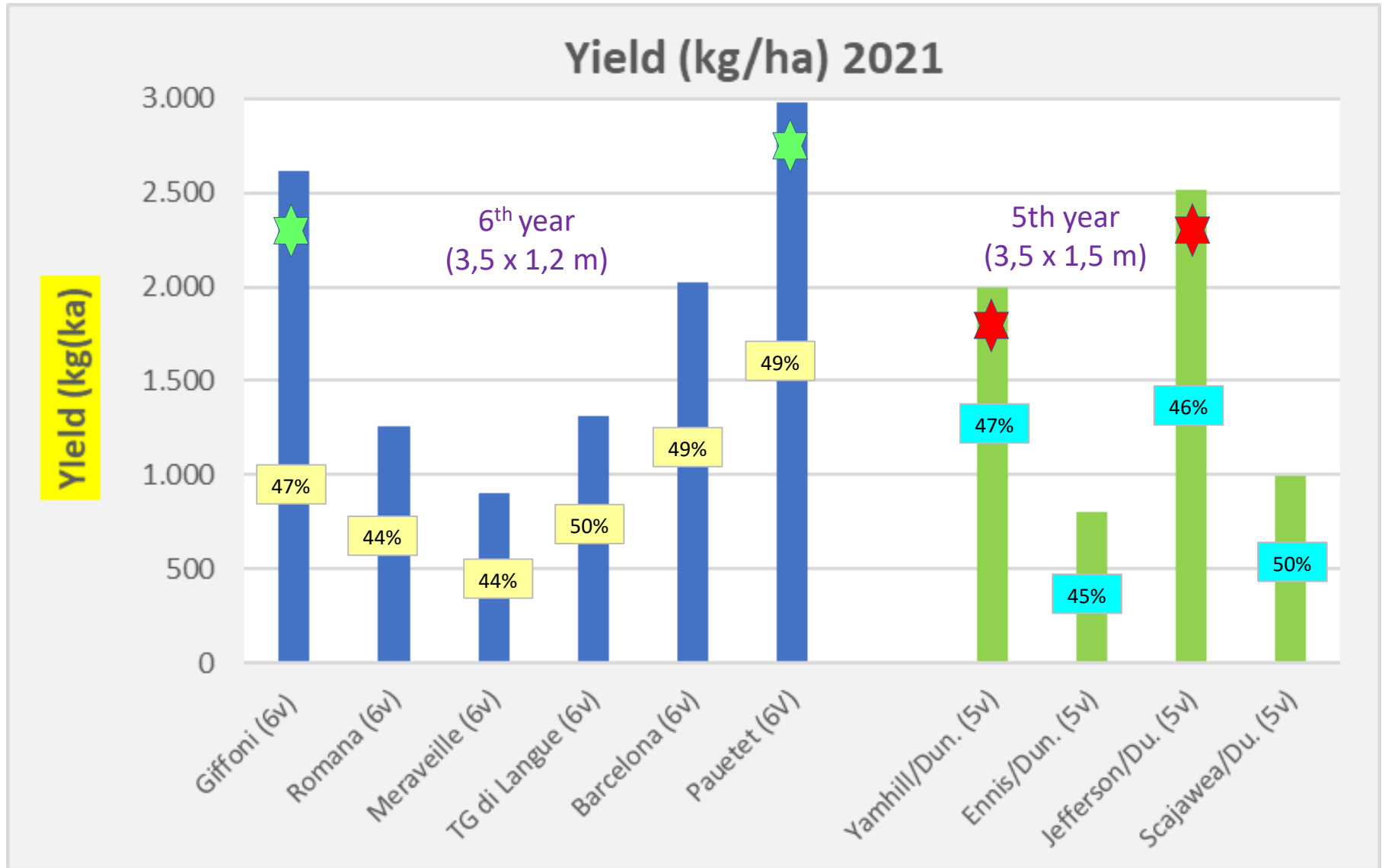
Annual Yields and % kernel





YIELD AND % KERNEL: Porxina Mequinenza (SPAIN)

6th year (2021)



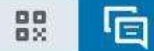


OBJECTIVES AND ROAD MAP OF MODERN HD HAZELNUT ORCHARDS IN SPAIN

- Grower Price: 2.20-2.50 €/kg
- Kernel (%) : 40-51 %
- Objective yields: Year-3 = 70% yield, year-4 = 100%
- Objective full yield: 3,500 to 4,000 kg/ha (50% kernel)
- Total Income grower: 6,600 €/ha - 8,750 €/ha
- Annual cost: 2,700 €/ha
- Difference: 3,900 -6,050 €/ha



Búsqueda



Ryan Flaherty • 2°



Grower Relations Manager at Hazelnut Growers of Oregon
6 días • 🌐

Oregon Hazelnut harvest is officially underway! Approximately three weeks earlier than traditionally harvested hazelnuts. Nuts are picked green before falling on the orchard floor. Littau blueberry harvester. Five year old McDonald orchard near Stayton, OR. [Hazelnut Growers of Oregon Littau Harvester, Inc.](#) #hazelnuts #oregonhazelnuts #agriculture #farming

Ver traducción



Mod.: ORXL-1711

OVER-ROW BLUE BERRY HARVESTER (Sept. 2020)



Mechanical harvest (LITTAU-2021)





CONCLUSIONES

Qué supone la intensificación sostenible

- **Mayor eficiencia en el uso de los inputs, en el ahorro de costes y una mayor rentabilidad. Precoz entrada en producción.**
- **¿Cómo contribuir a una sostenibilidad Ambiental, social y económica?
GENÉTICA + ARQUITECTURA ÁRBOL + USO TECNOLOGÍAS**
- **Copas mas pequeñas en plantaciones intensivas requieren un adecuado control del vigor con el manejo eficiente del riego, poda y la nutrición.**
- **Know How otros cultivos Sistema SES Agromillora**
- **Mucho por aprender**
- **ACCIONES COLABORATIVAS**



LA MEJOR FORMA PARA PREDECIR EL FUTURO ES CREARLO

GRACIAS!!!!



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