

Webinar *Resilient Smallholder Initiative* | 21 November 2024



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Better fruit from smart business

Scientific Coordinator
WESSEL, Dulcineia
Portugal



**Politécnico
de Viseu**



Grant Agreement No: 1733

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Participating States/ 5
Research Units/ 10



InovFarmer.Med Goal

- To improve Mediterranean supply chain through innovative agri-food business models to strengthen small-scale farmers competitiveness
- **Case Study**: Prickly pear and Fig
- **Project Beginning**: May 2022
- **Expected End**: December 2025



Participating States



Demo Sites: 4



New products and solutions: 2



Plataforms/Hubs: 1



1 | Small-Scale Farmers problems and needs





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IMPACT



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2 | Mobile App Prototype for Farmers

AI-powered image recognition

- Improve final product homogeneity
- Optimize harvests
- Reduce biowaste

Circular Economy





Used Dataset

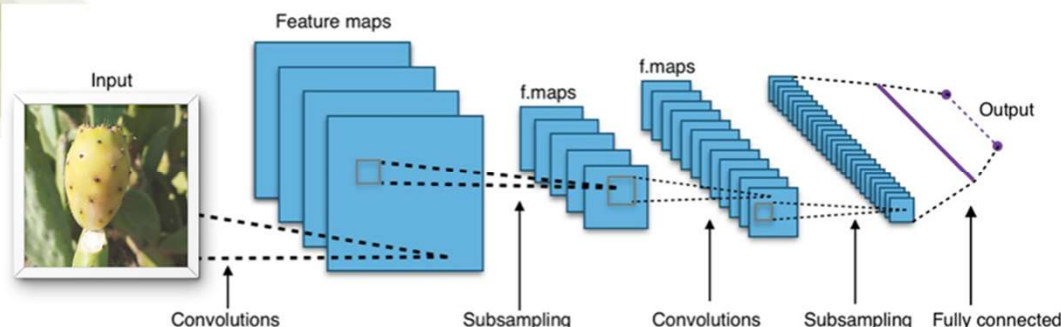


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Beginning of harvest: 31 July Sampling: 30 August		
Ripening stage		
	Midpoint	Ripe
Physicochemical parameters		
Mass (g)	115,8 ± 26,2	128,3 ± 23,3
Length (mm)	77,8 ± 10,0	74,8 ± 6,9
Diameter (mm)	50,1 ± 4,1	50,6 ± 3,2
Hardness (N)	27,4 ± 3,7	19,3 ± 2,4
Total Soluble Solids (° Brix)	14,9 ± 1,1	15,2 ± 0,8
Moisture (%)	86,4 ± 1,4	81,1 ± 1,6
Color (CIELAB space)		
Variety: Prickly Pear • Total of Images: 240	L*	58,3 ± 2,0
	a*	2,2 ± 2,8
	b*	32,6 ± 2,3
	c*	32,9 ± 2,5
	h*	86,6 ± 4,5
		56,3 ± 2,0
		14,8 ± 2,0
		28,6 ± 2,0
		32,3 ± 1,5
		62,5 ± 4,4

Beginning harvest: 7 June Sampling: 20 June (end of harvest)		
Ripening stage		
	Midpoint	Ripe
Physicochemical parameters		
Mass (g)	45,4 ± 6,4	50,2 ± 9,2
Length (mm)	60,2 ± 6,0	65,0 ± 7,1
Diameter (mm)	46,9 ± 2,9	44,8 ± 4,0
Hardness (N)	2,6 ± 0,9	1,2 ± 0,4
Total Soluble Solids (° Brix)	14,8 ± 1,3	16,9 ± 1,2
Moisture (%)	84,4 ± 1,6	78,5 ± 1,5
Color (CIELAB space)		
Variety: Lampa Preta • Total of Images: 160	L*	43,4 ± 3,8
	a*	5,9 ± 4,3
	b*	30,6 ± 6,1
	c*	32,4 ± 5,0
	h*	74,7 ± 11,3
		31,5 ± 2,8
		12,4 ± 3,1
		8,5 ± 4,8
		16,3 ± 3,9
		57,7 ± 52,6

Beginning of harvest: 03 August Sampling: 23 August		
Ripening stage		
	Midpoint	Ripe
Physicochemical parameters		
Mass (g)	26,9 ± 5,0	30,8 ± 7,2
Length (mm)	43,3 ± 4,3	43,1 ± 3,6
Diameter (mm)	38,5 ± 3,3	36,8 ± 3,5
Hardness (N)	9,3 ± 4,0	4,6 ± 1,4
Total Soluble Solids (° Brix)	21,3 ± 2,2	27,2 ± 3,4
Moisture (%)	76,2 ± 4,3	74,1 ± 5,2
Color (CIELAB space)		
Variety: Pingo de Mel • Total of Images: 160	L*	67,2 ± 3,1
	a*	-4,9 ± 2,4
	b*	58,5 ± 1,9
	c*	58,7 ± 1,8
	h*	94,9 ± 2,5
		69,3 ± 2,6
		0,5 ± 2,4
		61,1 ± 4,0
		61,0 ± 3,9
		89,3 ± 2,2



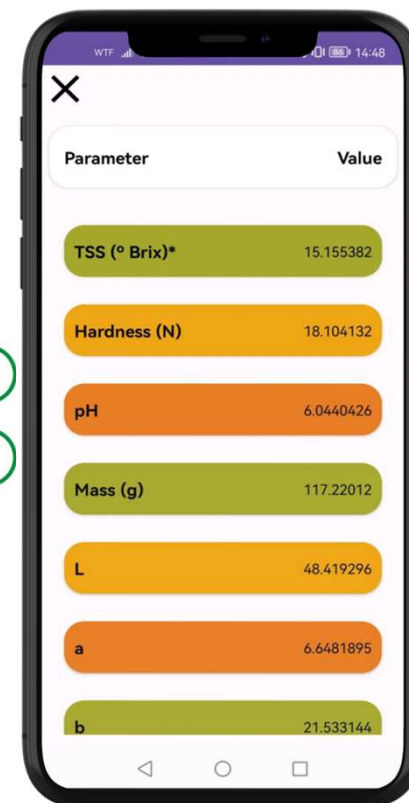
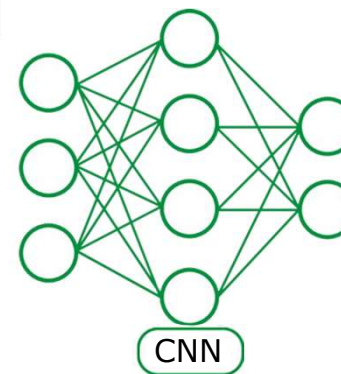
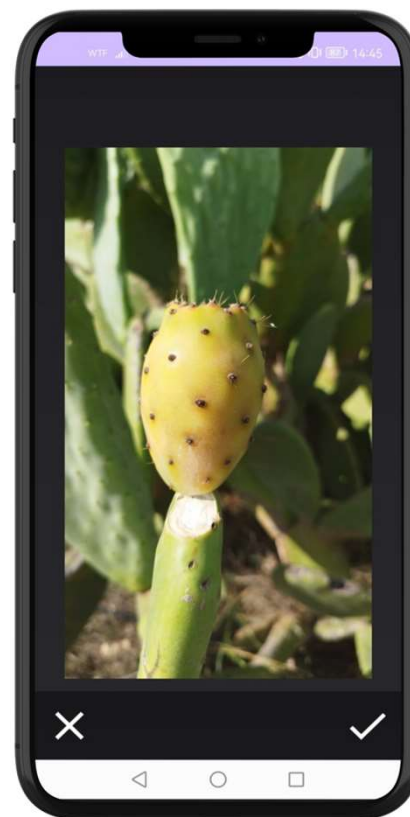
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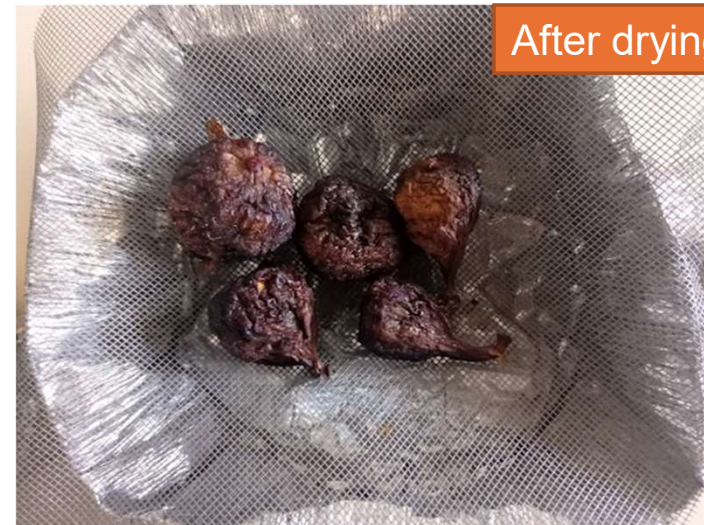
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Creation of the Mobile App

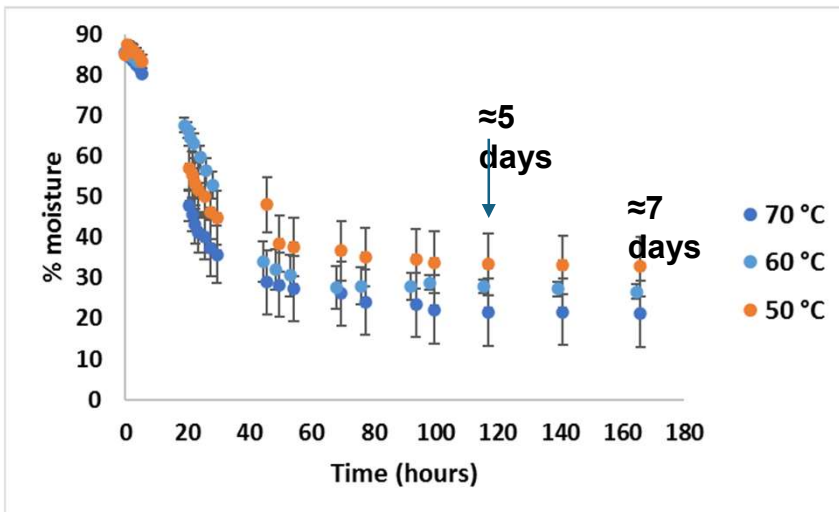


3 | Solar Drying Technology Deployment

- Improve product quality
- Longer shelf life
- Reduce food loss
- Farmer profitability



Food Loss



Drying tests in hybrid solar dryer



4.1 | Value-Added Products: *Opuntia ficus-indica*

Innovation to Market

Profit margins for producers



SORBET



Flour for Bakery

Infusion - Tee

Pigment Microparticles

Peels

33-55%

Pulp

45-67%

Beverages

- Juices
- Fermented beverages



Seeds

2-10%

High UV-Screening Factor Ingredient

Nanoencapsulation of Vit B12



4.2 | Value-Added Products: *Ficus carica*

► Food ingredients based on figs



- Sweetener with a balanced glycemic index and oligosaccharides
- Potential prebiotic ingredient rich in pectic polysaccharides and xyloglucans
- Ingredient rich in insoluble dietary fiber

Next steps

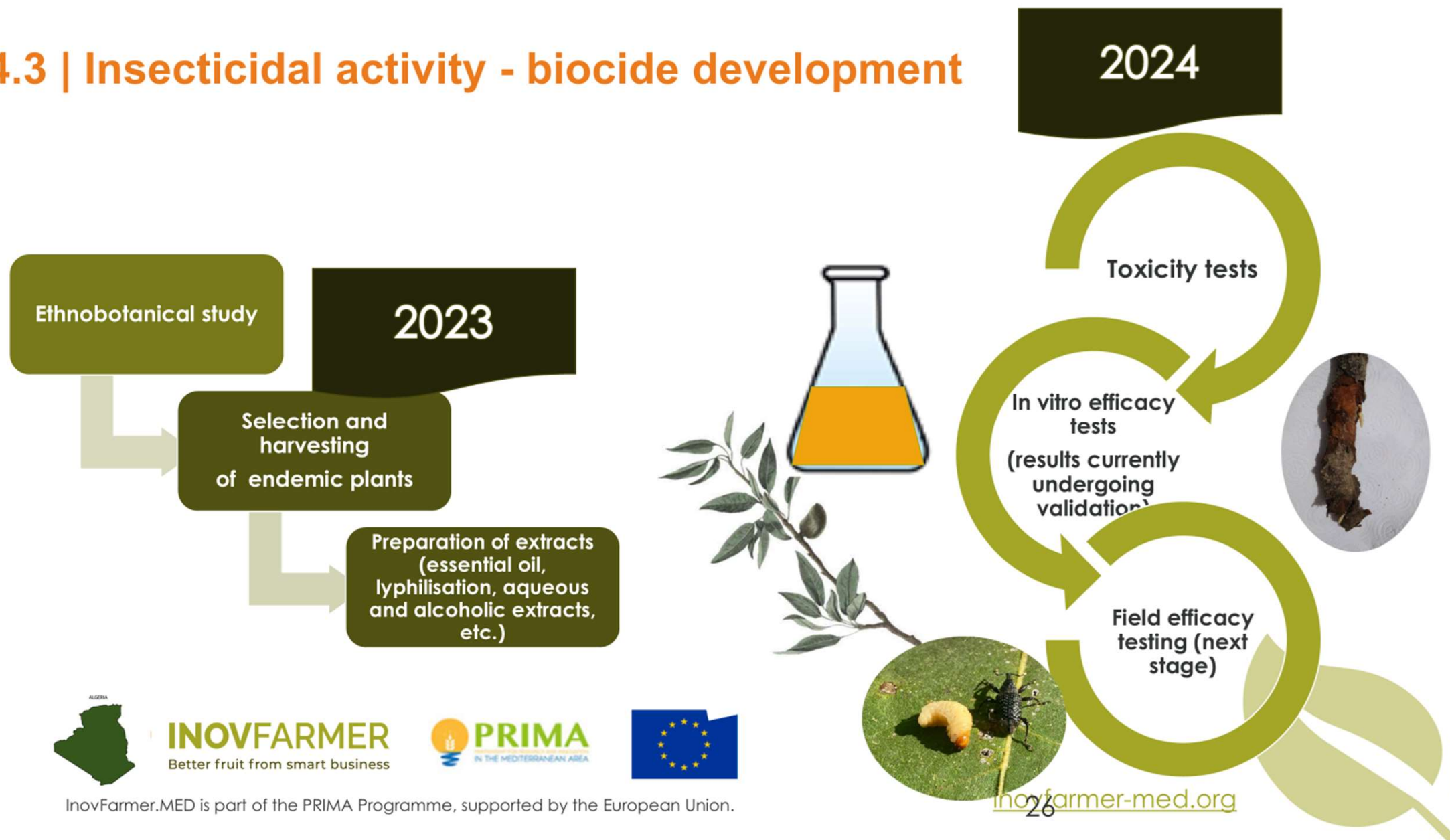


Assessment of prebiotic effect

Development of food prototypes



4.3 | Insecticidal activity - biocide development



4.4 | Application of cover crops as a tool for regenerative agriculture



Agroecological Practices



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5 | Co-Creation of Resilient Business Models

Business modelling and ecosystem design

Knowing

01

Opportunities to make full use of stakeholder's production

Value chains in which each activities operate

02

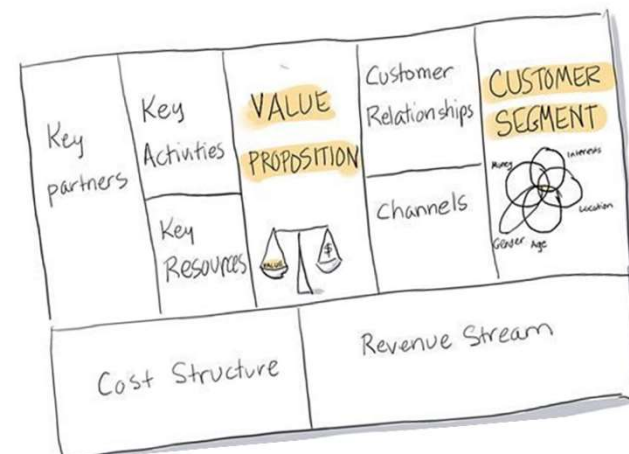
03

Market trends and requirements



5 | Co-Creation of Resilient Business Models

Business modelling and ecosystem design



Impact



Agreements signed between the stakeholders

Formalize **commitment**, promote **shared understanding**

Highlight the potential **benefits of new market value propositions.**



TECHNICAL ITINERARIES

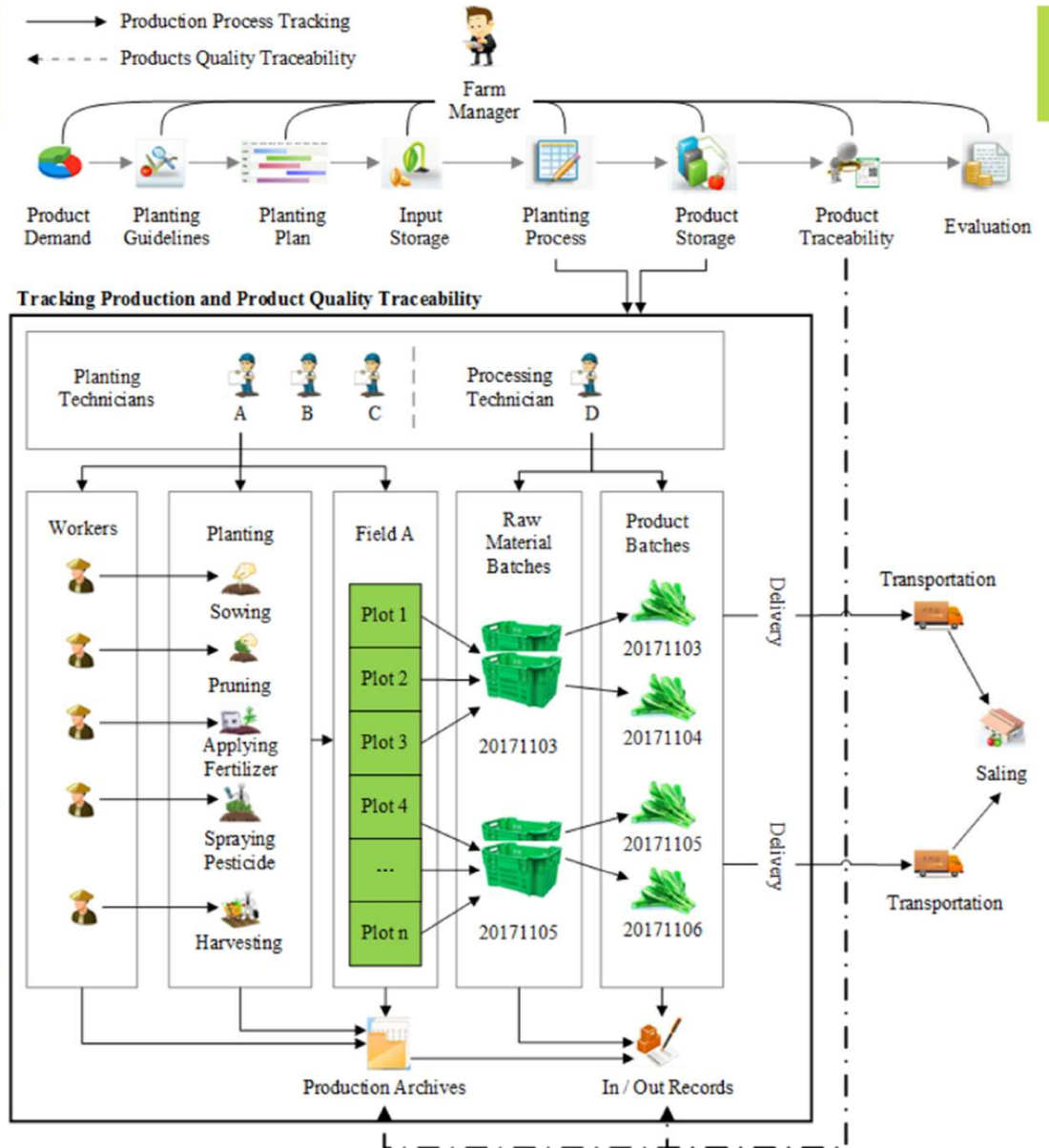
A crop itinerary

A generic process consisting of a succession of technical tasks and recommendations for agricultural production

For a given crop, the crop itinerary has to be specialised according to the cultural context and the farmer's cultivation methods.

**Technical
decision**

**Economic
Business model**



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OUR TEAM



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- LAQV-REQUIMTE (LA/P/0008/2020, <http://doi.org/10.54499/LA/P/0008/2020>; UIDP/50006/2020, <http://doi.org/10.54499/UIDP/50006/2020>; and UIDB/50006/2020, <http://doi.org/10.54499/UIDB/50006/2020>)



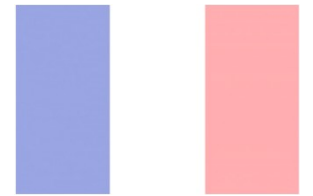
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Partners



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IPV – Instituto Politécnico de Viseu



TA Consulting – Pais da Costa & Esteves Pereira – Consultoria Lda



UA – Universidade de Aveiro



UIZ – University Ibnou Zohr



INRAE – Institut National de la Recherche Agronomique



F4S – Food4Sustainability



ACICT – Arab Company for Information and Communication Technology



ENSV – Ecole Nationale Supérieure Vétérinaire



Chatron Lda



SVU – South Valley University



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Thank you
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