



NOVATERRA

WP5 The Human Factor. The socio-economic aspect: Acceptance by the sector and consumer preferences

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CREDA (IRTA)

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The NOVATERRA project has received funding from the European Commission's Horizon 2020 Grant Agreement Number 101000554.



WP5 - VALIDATION AND IMPACT EVALUATION OF INTEGRATED GLOBAL SOLUTIONS FOR AN EFFECTIVE AND ADAPTED IPM STRATEGY

Task 5.2 Developing new studies for social and economic impact.

Subtask leader: IRTA (Third Party CREDA); Duration: Months 13-48.

Subtask 5.2.1: Evaluation of **stakeholders' acceptance** of different alternatives to contentious plant protection products in vineyard and olive grove (**M24-42**).

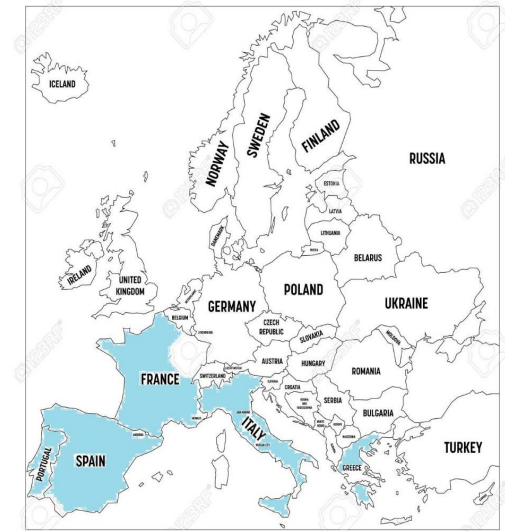


Subtask 5.2.2. **Cost-benefit assessment** for the proposed alternative technologies to contentious plant protection products in vineyard and olive grove (**M13-36**).



Subtasks 5.2.3. **Willingness to pay of consumers** for products (wine and olive oil) obtained with different alternatives to contentious plant protection products in vineyard and olive grove (**M13-36**).





REPORT FINALIZED

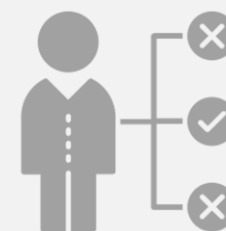
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- **45 field case studies** envisaged in the project → **4 field case studies selected from each WP**

Selected innovations:

- **WP2: 2.2 Plan protection alternatives (Bio solutions) → FRANCE**
- **WP3: 3.5 Ready to use smart mapping (To produce satellite imagery for precision spraying) → SPAIN**
- **WP4: 4.4. Soil management strategies → (Robot) → PORTUGAL**
4.3.1 Cover Crops and floral margins → GREECE

Applicable:
Olive groves
Vineyards



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A	B	C	D	E	F
	cost of installation(€)				
Irrigation cost					
	Irrigation equipment ammortization (how many years since the installation of your irrigation system?):		Years	#DIV/0!	
	Basic cost of standard installation:		0		
	Expenses on borehole, pump, trenches, pipes, (€/per ha)				
	Expenditure on head and fertigation equipment (€/per ha)				
	Expenditure on distribution network (€/per ha)				
	Expenditure on maintenance of installation(€/ per ha)				
	Please state the total cost of installation if the breakdown above does not apply to your vineyard (€/ha)				
Plantation cost					
	Depreciation cost of plantation (How many years since you planted your vineyard?):	55	Years	184	
	Basic planting cost of 1 ha of vine:			10120	
		€/hour	No. of hours/ha		
	Soil preparation (ploughing,etc)	50	2	100	
	Soil disinfection	60	1	60	
		€/Unit	No. of Unit/ha		
	cost of buying grafted plant	1,3	3300	4290	
	Cost of planting	0,5	3300	1650	
	Purchase of tutor (rod, cane, bamboo ..)	1	3300	3300	
	Purchase of rabbit protector	0	0	0	
	Cost of fixing the rabbit protector	0	0	0	
	Number of passes by the cultivator	6		0	
	Cost per pass by the cultivator (€)	30	4	720	
	If the above does not apply to you, please state the total cost of establishing a one hectare vineyard (€/ha)				
Land cost				1500	
	How much will you earn if you rent out a hectare of the land for your vineyard for a year (€/ ha per year)	1500			
	Interest payment for land (if any) in the last year per hectare (€/ha)				
Total depreciation costs-C				#DIV/0!	
TOTAL COST WITHOUT (A+B+C)					

TWO CBA PROTOCOLS:

Without VRS With Innovation



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Innovation: SMART CANOPY CHARACTERIZATION (MAPPING)

Description: The innovation uses satellite imagery to automate the generation of prescription maps based on spectral indices which are related to canopy characteristics (height and width) to ensure the that optimal doses of pesticide is applied.

Initial investment cost: 7.000 EUROS (For purchase Universal equipment that can be placed on machinery/tractor).

Maintenance cost: 500 EUROS per year.

Advantages over existing method:

1. Reduce the product (pesticide) applied at farm level
2. Improve deposition of product on leaves
3. Improve effectivity of plant protection products
4. Reduce drift and risk of environmental contamination

Direct benefits from innovation:

1. Up to 40% reduction in pesticide use (and associated costs)
2. Up to 40% reduction of water use and increase the efficiency
3. Traceability of working conditions in spraying applications

Farm size: 30 ha

Depreciation : 8 years

29,16 €/ha hardware

5 treatment by campaign: 25€/ha

Maintenance: 16,66€/ha

70,16 €/ ha

70% pesticide

33% water



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Innovation: ROBOT (MODULAR-E) WITH MOWING END-EFFECTOR (MOWIT) FOR SOIL MANAGEMENT

Description: A robot with soil sensors capable of removing weeds and providing precise soil fertilization/treatment.

Initial investment cost: 20.000 EUROS for the purchase of the Modular-E Robot and Mowit tool

Maintenance cost: 250 EUROS per year

Advantages over existing methods:

1. It works completely automated
2. It can be controlled/connected to almost any Decision Support Systems
3. No herbicide required (just mechanical weeding)
4. It can be extended with other functionalities such as precision spraying and pruning

Farm size: 30 ha

Depreciation : 8 years

83,33 €/ha hardware

Maintenance: 8,33€/ha

91,66€/ha

Direct benefits from innovation:

1. Reduce herbicide cost up to 80% for weed control between tree lines
2. Improve soil management and soil compaction
3. Reduce labor cost on fertilization and weed control by 40%
4. Preservation of the soil structure and life

80% pesticide

40% water



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Innovation: COVER CROPPING AND FLORAL MARGINS FOR ENHANCED PEST CONTROL (IMPROVED SOIL MANAGEMENT)

Description: Involves the introduction of beneficial plants (shrubs, flowers) among the crop lines (olive groves or vineyards) to attract the natural enemies of pests.

Initial investment cost: 3.600 EUROS per hectare to establish

Maintenance cost: 525 EUROS per hectare per year

Advantages over existing methods:

1. Increase biodiversity and minimize pest population
2. Improve soil health
3. Increase yield and quality of crops
4. Efficient and involves low cost

Direct benefits from innovation:

1. Reduced 30% fertilization inputs through natural nitrogen cycles
2. Control pests naturally through increased inter-species competition
3. Protection against soil erosion and water preservation
4. Increased soil health and biodiversity which leads to increased nutrient absorption

Farm size: 1 ha

Depreciation: 50 years

**Cost of innovation: 314,66€/ha
per year (discount rate of 5%)**

Maintenance: 525€/ha per year

- 30% less fertilization
- Control erosion and
- Biodiversity





Innovation: BIO-SOLUTIONS

Description: Combining bio-stimulants and bio-control products with low doses of copper and sulfur formulations to fight diseases.

Initial investment cost: None

Annual cost: 20% Higher than existing chemical treatments methods

Advantages over existing methods:

1. Adapted to the disease pressure based on the rate of prevalence
2. Agro-ecologically friendly.

Direct benefits from innovation:

1. Higher product prices due to sustainable certifications
2. Reduce the use of pesticides by up to 30%

Farm size: 1ha

High disease pressure: 535 €/ha (i.e. 20% more than conventional method)

Low disease pressure: 110 €/ha (i.e. 10% more than conventional method)

- 85% less pesticide use in case of high disease pressure
- 95% less pesticide use in case of low disease pressure



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Subtask 5.2.2. **Cost-benefit assessment** for the proposed alternative technologies to



SURVEY QUESTIONNAIRE

used to determine factors affecting the adoption decision. Probability of adoption

Develop a WEB BASED TOOL with indicators to assess and PREDICT the probability of adoption and intentions



INTERVIEWS with the stakeholders (Portugal, Spain, France and Greece) to **CONFIRM** Farmers' Survey design. **OBJECTIVE :**

- 1- **WHO** is the **RESPONSIBLE** for **SELECTING** the plant protection treatment at farm level?
- 2- **WHO DECIDES** on whether the **INNOVATION** or new treatment is adopted at farm level?
- 3- What is the **ROLE-PLAYED BY FARMERS** in adoption decisions?
- 4- To Identify the **DETERMINANT FACTORS** that affect the processes and the decision to adopt innovations (current situation of adoption, limitations, problems, motivations, willingness to invest, barriers ETC...)

Olive grove sector (total 8 interviews)

Vineyard sector (total 8 interviews)



Results of interviews

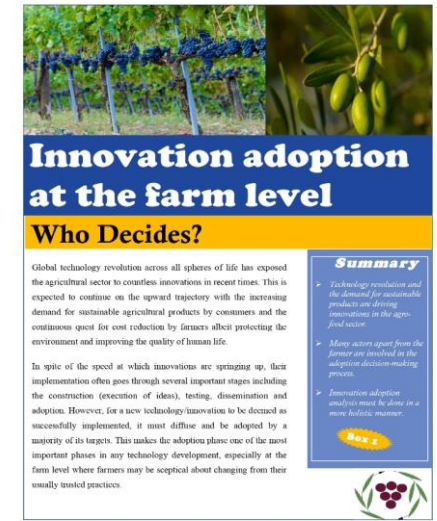
Outcome shows that **SEVERAL ACTORS** are involved in the innovation adoption decision-making process at the farm level

ACTORS

1. Commercial companies
2. Farm managers
3. Policy regulators
4. Technical advisors of cooperatives
5. Specialized governmental institutions
6. Phytosanitary regulators
7. Extension officers etc....

DEPENDS ON

1. Farm size & Management
2. Farmers
3. Membership of an association
4. Experience of the farmer
5. Type of innovation
6. Technical advisors (Commercial & extension).

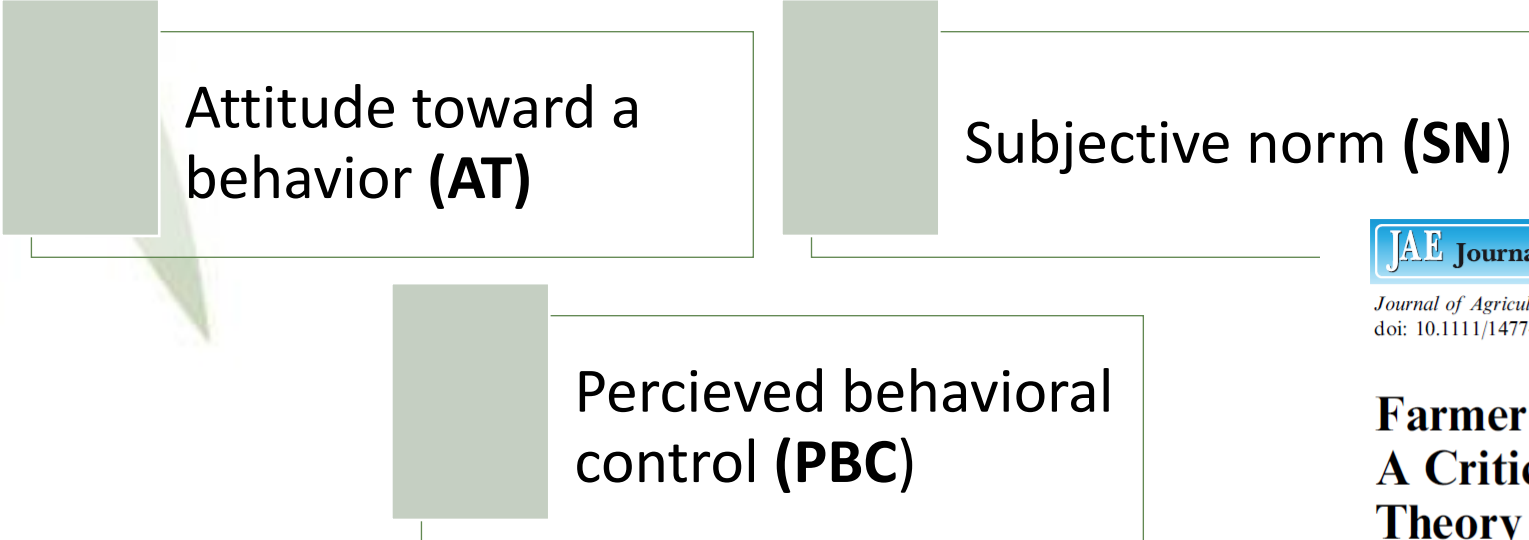


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1. Theory of Planned behaviour-TPB

- Has been widely applied to the prediction and change of behavior, including behavior to the use/adoption of a technology/innovation.
- According to this theory, behavioral intention is determined by three main factors:



Attitude toward a behavior **(AT)**

Subjective norm **(SN)**

Perceived behavioral control **(PBC)**

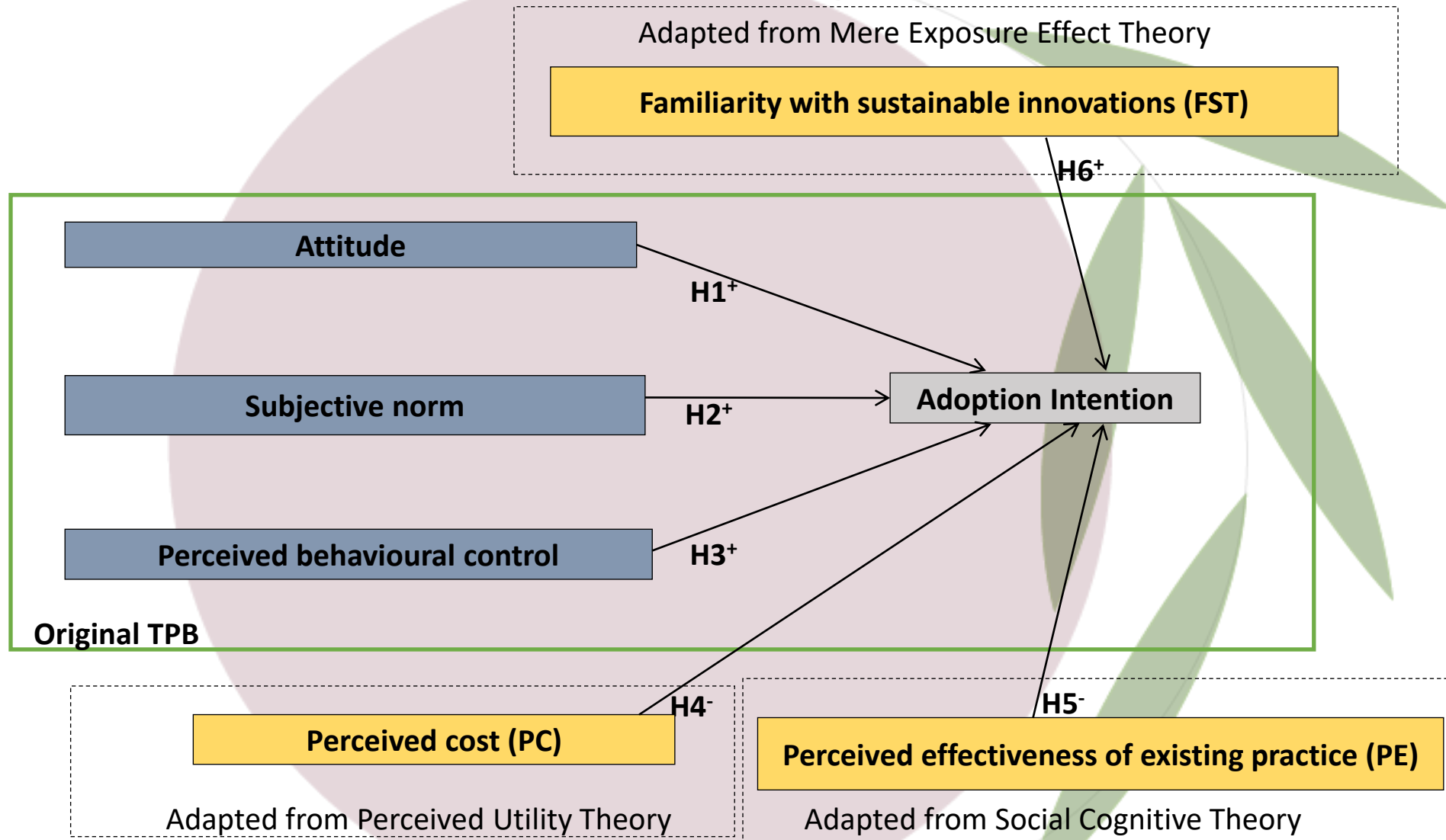
JAE Journal of Agricultural Economics

Journal of Agricultural Economics
doi: 10.1111/1477-9552.12408

Farmer Behaviour as Reasoned Action: A Critical Review of Research with the Theory of Planned Behaviour

Jaap Sok, Joao Rossi Borges , Peter Schmidt and Icek Ajzen

(Original submitted January 2020, revision received September 2020, accepted September 2020.)



DATA FOR ADOPTION STUDIES

PARTICIPANTS: FARMERS AND ALL STAKEHOLDERS IN THE IN THE VINEYARD AND OLIVE SECTOR

LANGUAGE: FRENCH, GREEK, ITALIAN, PORTUGUESE, SPANISH

DURATION OF COLLECTION: NOVEMBER 2023-FEBRUARY 2024

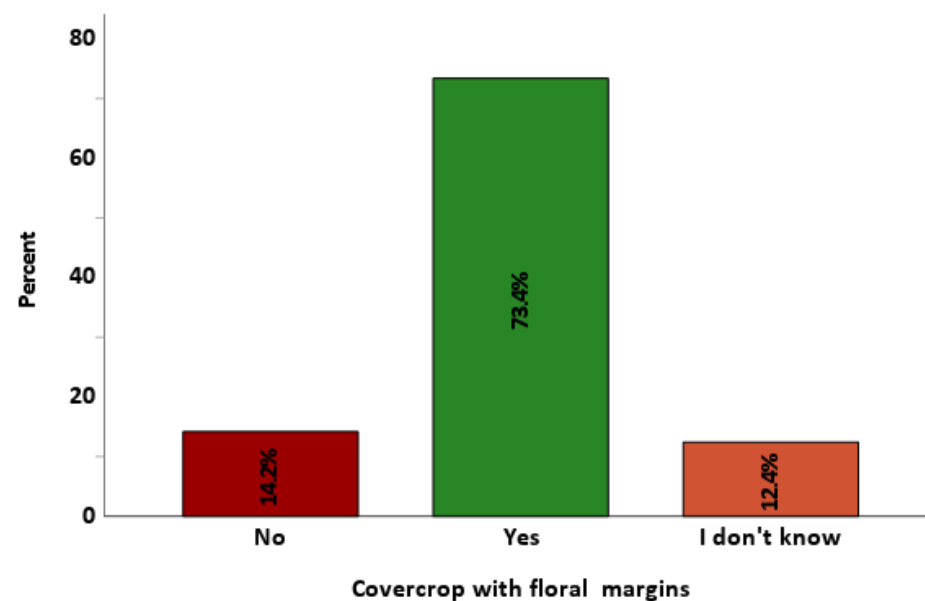
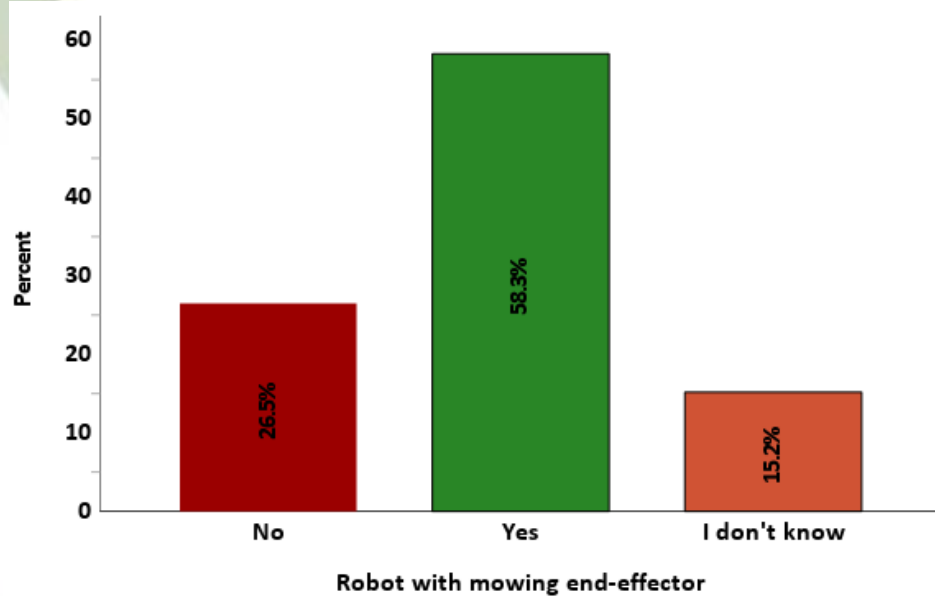
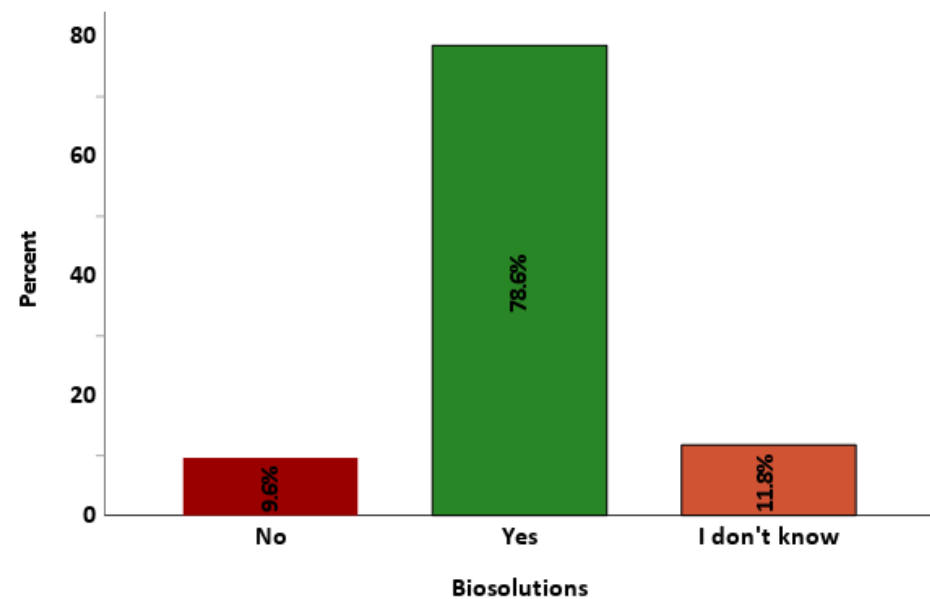
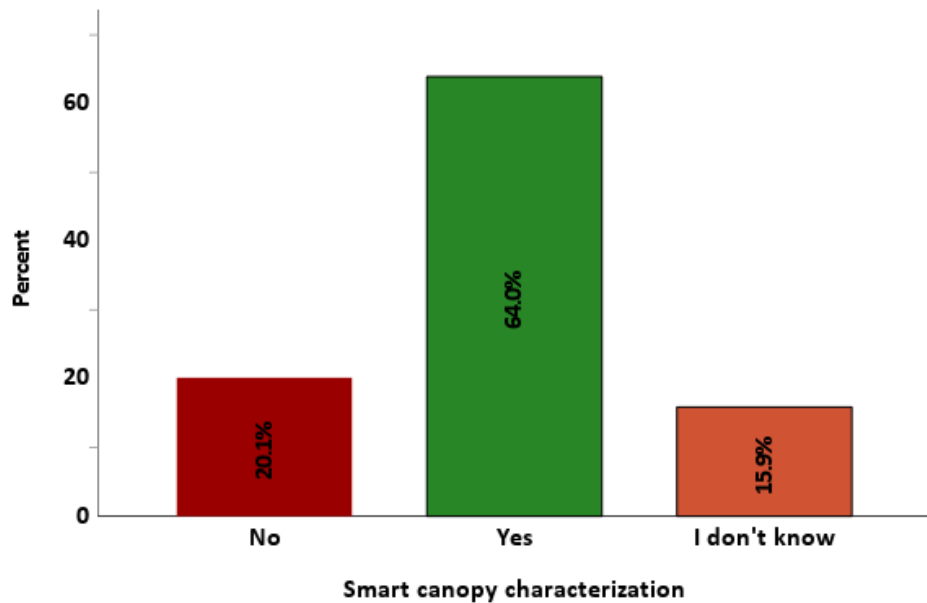
SAMPLE BREAKDOWN:

Country	France	Greece	Italy	Portugal	Spain
Number of participants	29	38	36	123	136
Total Sample for study	354				



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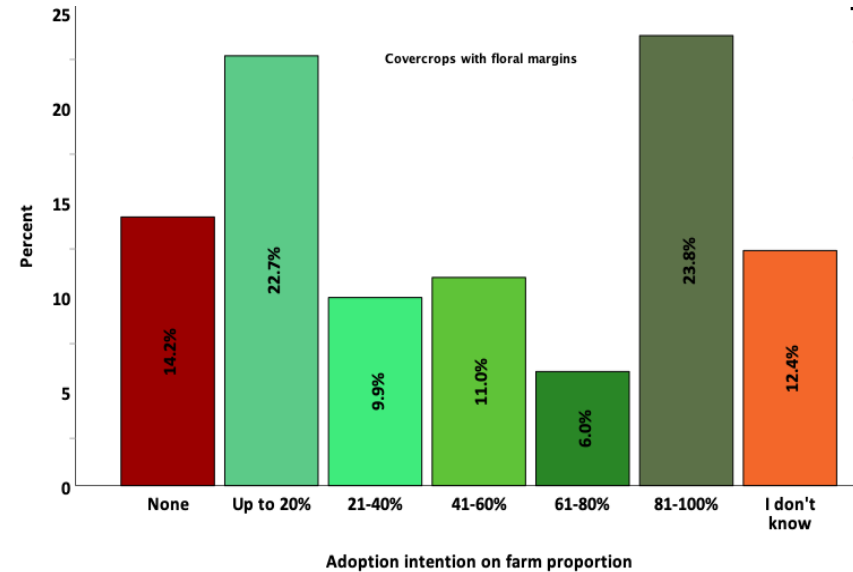
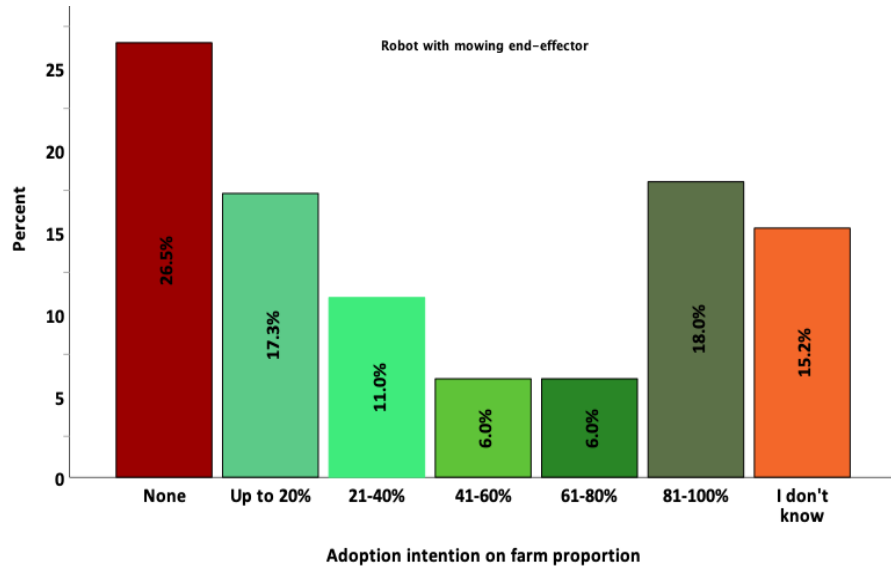
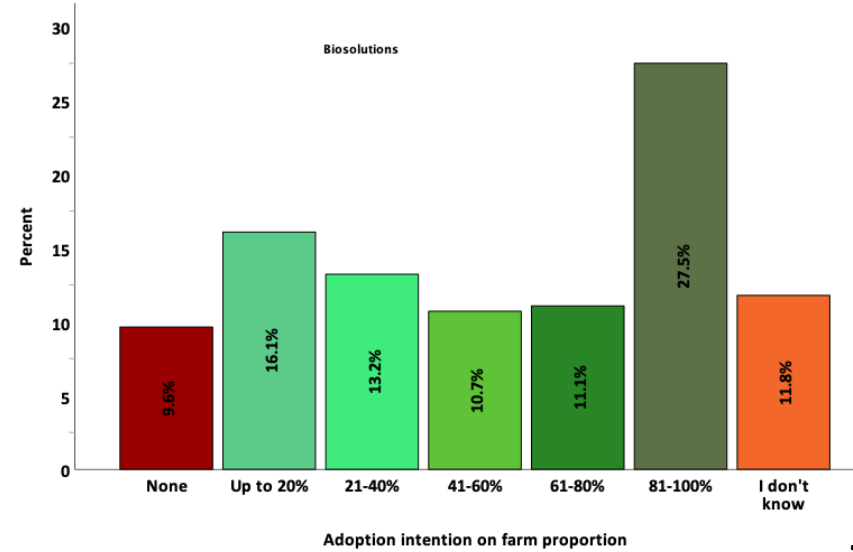
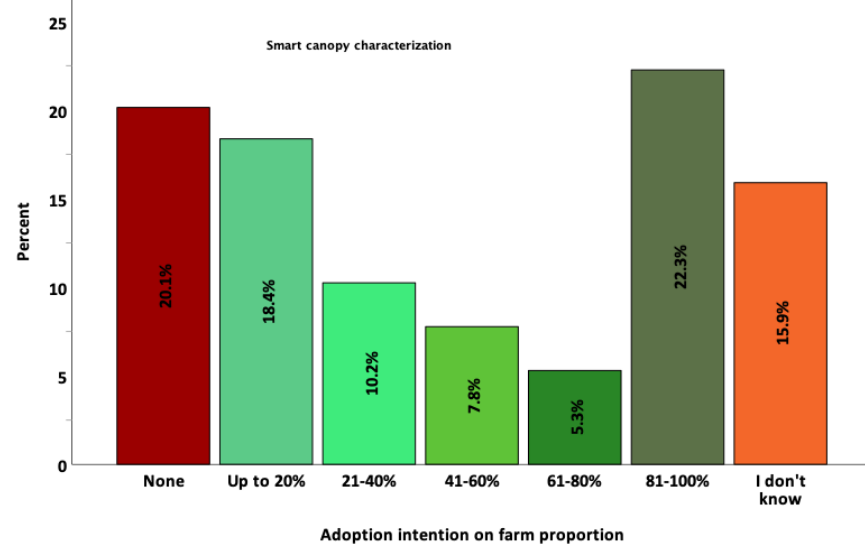




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Adoption intention on farm proportions

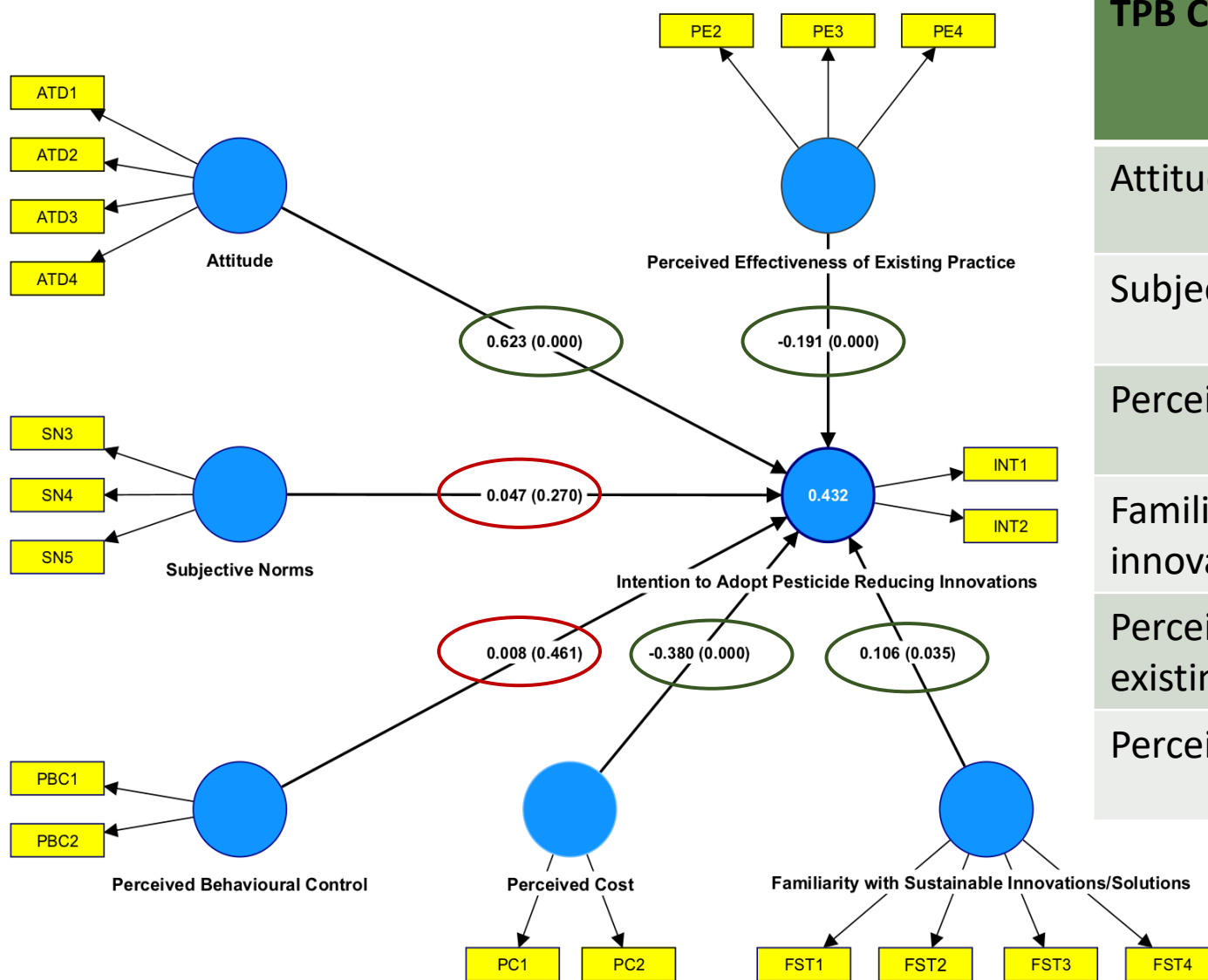


Three main groups:

- NO
- YES
- UNCERTAIN (I don't know)



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TPB CONSTRUCTS	IMPACT ON ADOPTION INTENTION (Hypotheses)
Attitude	Positive and significant
Subjective norm	Positive, not significant
Perceived behav. control	Positive, not significant
Familiarity with proposed innovations	Positive and significant
Perceived effectiveness of existing practice	Negative and significant
Perceived associated cost	Negative and significant



PREDICTING ADOPTION INTENTION

Predicting Adoption Intention

A predictive tool based on the Theory of Planned Behavior

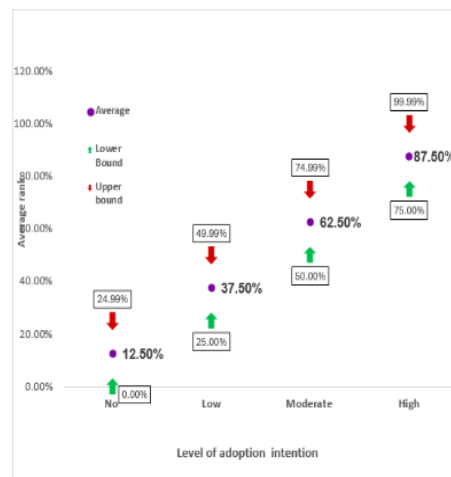


[LINK](#)



[LINK](#)

Based on your responses to the statements, this tool predicts based on the Theory of Planned Behavior that you have **NO INTENTION** to adopt pesticide-reducing innovations.



Levels of Adoption Intention

- NO INTENTION
- LOW INTENTION
- MODERATE INTENTION
- HIGH INTENTION

END

The Theory of Planned Behavior (TPB) is an extension of the Theory of Reasoned Action (TRA), which states that behaviour results from the intention to engage in a specific action. The stronger the intention, the more an individual is likely to engage in the behaviour. Read more here: <https://doi.org/10.1016/j.jclepro.2023.139755>

WEB-BASED TOOL:

<https://ja.cat/WGYT5>



EU-funded HORIZON 2020 project
Grant agreement number 101000554



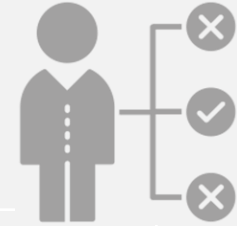
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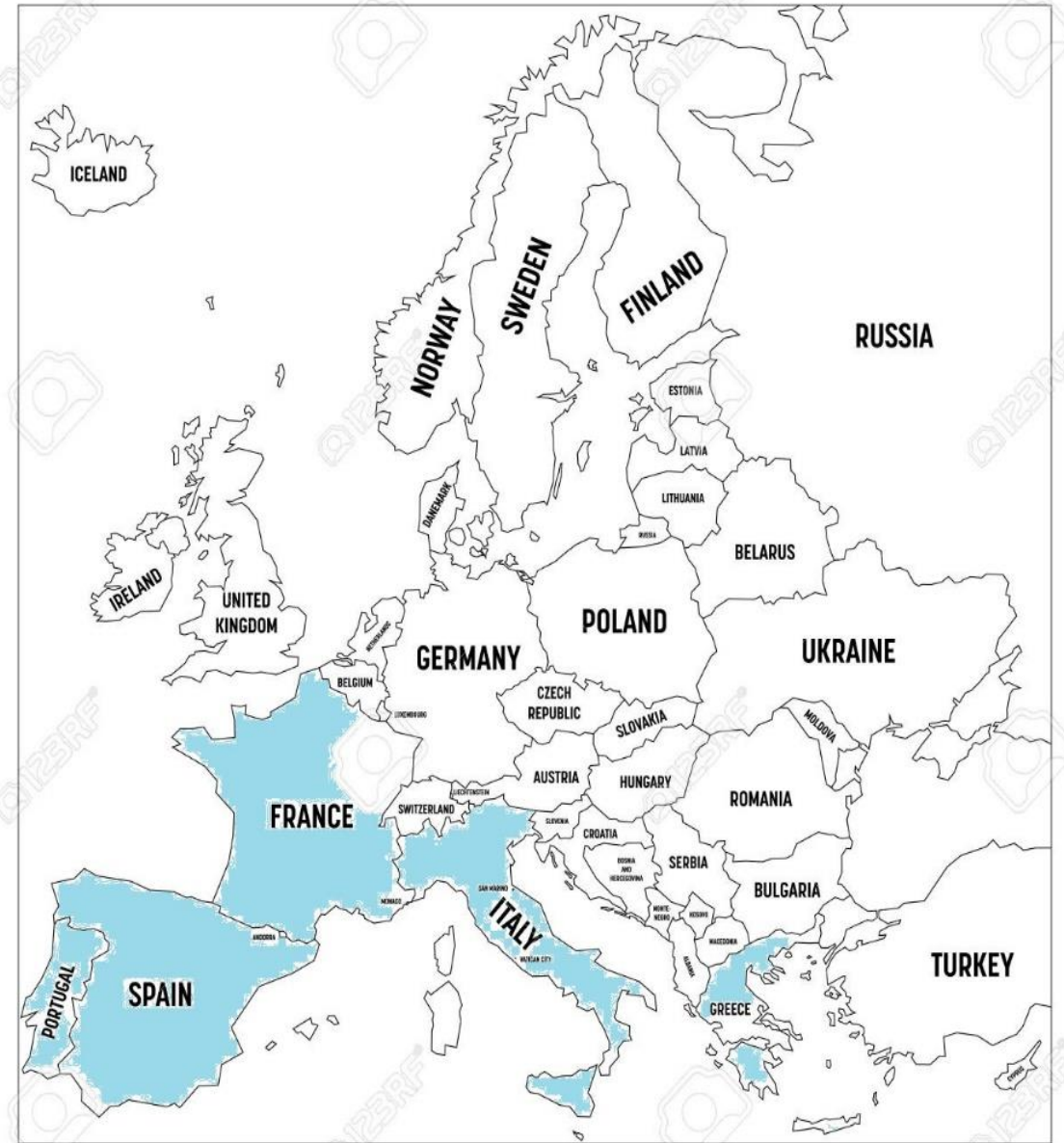
- **Semi-structured QUESTIONNAIRE for both wine and olive oil consumers.**
 - **5 COUNTRIES: Spain, Italy, Portugal, Greece and France.**



CONSUMER SURVEY

5.091 CONSUMERS

- All Adults above 18 years!
- Responsible for purchase decisions!
- Bought both wine and olive oil in the last 3 months prior to survey!
- Quota representation of gender and all age brackets!



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HYPOTHETHICAL BIAS

BEFORE EXPERIMENT

- Cheap talk script

&

- Solemn Oath

NOTE: Studies show that people tend to act differently when they face hypothetical decisions. In other words, there is a difference between what people say they will do and what they do in real market. However, we want you to behave in the same way that you would do if you really had to pay for the product and take it home. Please take into account how much you really want the wine you choose, as opposed to other wines in each scenario.

SOLEMN OATH

Topic: Project NOVATERRA; Reference Number: (2020)101000554.

I, the undersigned do swear that during the below experiment,

I will

Tell the truth and always provide honest answers

Do you agree to this oath?

☐ Yes

☐ No



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Wine preferences → DISCRETE CHOICE EXPERIMENT (DCE)

- ❑ The product is **DESCRIBED** through an array of **ATTRIBUTES**.
- ❑ **ATTRIBUTES** are defined through different **LEVELS**
- ❑ The **COMBINATION** of attributes' levels following orthogonal designs allow to create hypothetical scenarios: "**ALTERNATIVES**".
- ❑ Alternatives are **ARRANGED** together following experiment designs to constitute "**CHOICE SETS**".
- ❑ Respondent are **ASKED** to chose between the **ALTERNATIVES** in each **CHOICE SET**.



Generate EXPERIMENTAL DESIGNS using software NGENE

	Product “A”	Product “B”	Product “C”
Attribute 1 (A ₁)	Level m (L _{1.m})	Level m (L _{1.m})	Level m (L _{1.m})
⋮	⋮	⋮	⋮
Attribute n (A _k)	Level p (L _{k.p})	Level p (L _{k.p})	Level p (L _{k.p})



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Attributes for choice experiment

Attribute	Definition	Level1	Level2	Level3	Level4
Pesticide Reduction	The percentage volume of pesticides reduced by conventional vineyards using alternative innovations.	-10%	-20%	-30%	-40%
Certification	Certification labels to signify compliance with acceptable levels of pesticide use.	No- certification(0)- Base level	Independent/Third party certification(1)	Participatory guaranteed certification(2)	EU/National certification(3)
Price	Price variation in percentage based on respondents' stated reference prices in Euros (€) for a 750ml bottle of red wine for regular home consumption.	5%	20%	35%	50%



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Dynamic order of Choice experiment questions

1. Reference price: Please indicate how much you usually pay for a standard 750ML RED wine for your regular consumption at home ----- €

2. Choice Question: You indicated that you usually pay **2.55 €** for your **750ML BOTTLE** of **RED** wine for regular consumption at home. Which red wine below will you purchase for your usual home consumption based on the level of **PESTICIDE REDUCED**, **PRICE**, and **CERTIFICATION? IMAGINE** that these **RED** wines are from the same **BRAND** and have the **SAME ATTRIBUTES** and **CHARACTERISTICS** as those you usually purchase (usual occasion) for regular home consumption.

<u>Wine 1</u>	<u>Wine 2</u>	
• 30% Pesticide reduction • Independent/Third-party certification	• 20% Pesticide Reduction • No certification	None of these (I prefer my last purchase)
		
3.83 €	2.68 €	
☐	☐	☐

ANALYSIS OF THE CHOICES

For each alternative j , the individual utility function (U_{ij}) is the sum of a systematic or deterministic element (V_{ij}) and a stochastic or random component (ε_{ij}):

$$U_{ij} = V_{ij} + \varepsilon_{ij} = \sum \beta_{ik} x_{ijk} + \varepsilon_{ij}$$

The probability that an individual i will choose the alternative k over the alternative j :

$$P(U_{ik} > U_{ij}) = P[(V_{ik} - V_{ij}) > (\varepsilon_{ij} - \varepsilon_{ik})] \quad k \neq j \quad k, j \in C$$

Probability of an individual i choosing alternative j over a set of alternatives J is given by the conditional logit model:

$$\Pr_i(j) = \frac{\exp(\beta x_{ij})}{\sum_j \exp(\beta x_{ij})}$$

In RPL models, the individual's i deterministic part of the utility function is usually represented as a linear additive expression:

$$V_{ij} = \alpha_j + \beta_i x_{ij} + \varepsilon_{ij} = \alpha_j + \bar{\beta}_i x_{ij} + \theta_i x_{ij}$$



Olive oil preferences: Dynamic order of contingent valuation question

1. Please state how much (in €) that you usually pay for your **1 LITRE(L) bottle of the conventional olive oil** for your **regular home consumption**. In case you usually buy more than **1L bottle**, please convert the price to **1L equivalent** ----- €



2. You just stated that you usually pay **5.5 €** for a **1LITRE(L) bottle of the conventional olive oil** that you usually purchase for your **regular home consumption (usual occasion)**.

Are you willing to pay more for 1 L olive oil considering the new alternative treatments adopted by farmers to reduce pesticide use in olive groves? **IMAGINE THAT** the Olive Oil is of the same **BRAND**, the **SAME ATTRIBUTES** and **CHARACTERISTICS** as the one you usually purchase (usual occasion) for home consumption. However, the Olive oil only differ by the its cultivation based on the lower **LEVEL OF PESTICIDE** used in the olive grove, the type of **CERTIFICATION** and the **PRICE level**.



3. You indicated that you are willing to pay **between 1 and 2 €** more . What exact amount are you willing to pay?-----

- ☐ No I am not willing to pay more
- ☐ Yes, less than 1 €
- ☒ Yes, between 1 and 2 €
- ☐ Yes, between 2 and 3 €
- ☐ Yes, between 3 and 4 €
- ☐ Yes, between 4 and 5 €
- ☐ Yes, between 5 and 6 €
- ☐ Yes, between 6 and 7 €
- ☐ Yes, between 7 and 8 €
- ☐ Yes, between 8 and 9 €
- ☐ Yes, more than 9 €



Heckman Sample Selection Model: Double hurdle model

$$\begin{aligned} \log y &= x'\beta + v & \text{if } z'\alpha + u > 0 \\ y &= 0 & \text{if } z'\alpha + u \leq 0 \end{aligned}$$

y is the dependent variable, in our case, the WTP

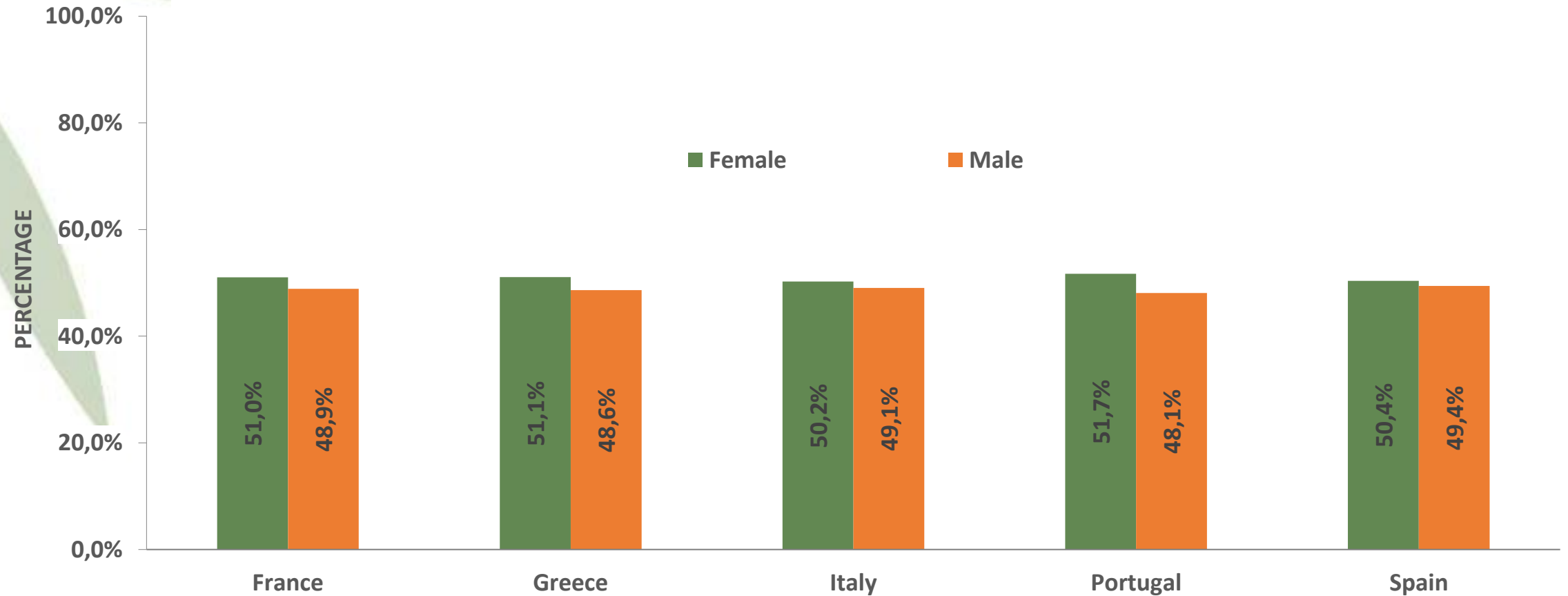
x represents the vectors of the independent variables included in the outcome equation, in our case, the variables included in the equation of WTP (how much)

z represents the vectors of the independent variables included in the selection equation, in our case, the variables included in the equation of WTP (yes/no)



RESULTS: Socio-demographic

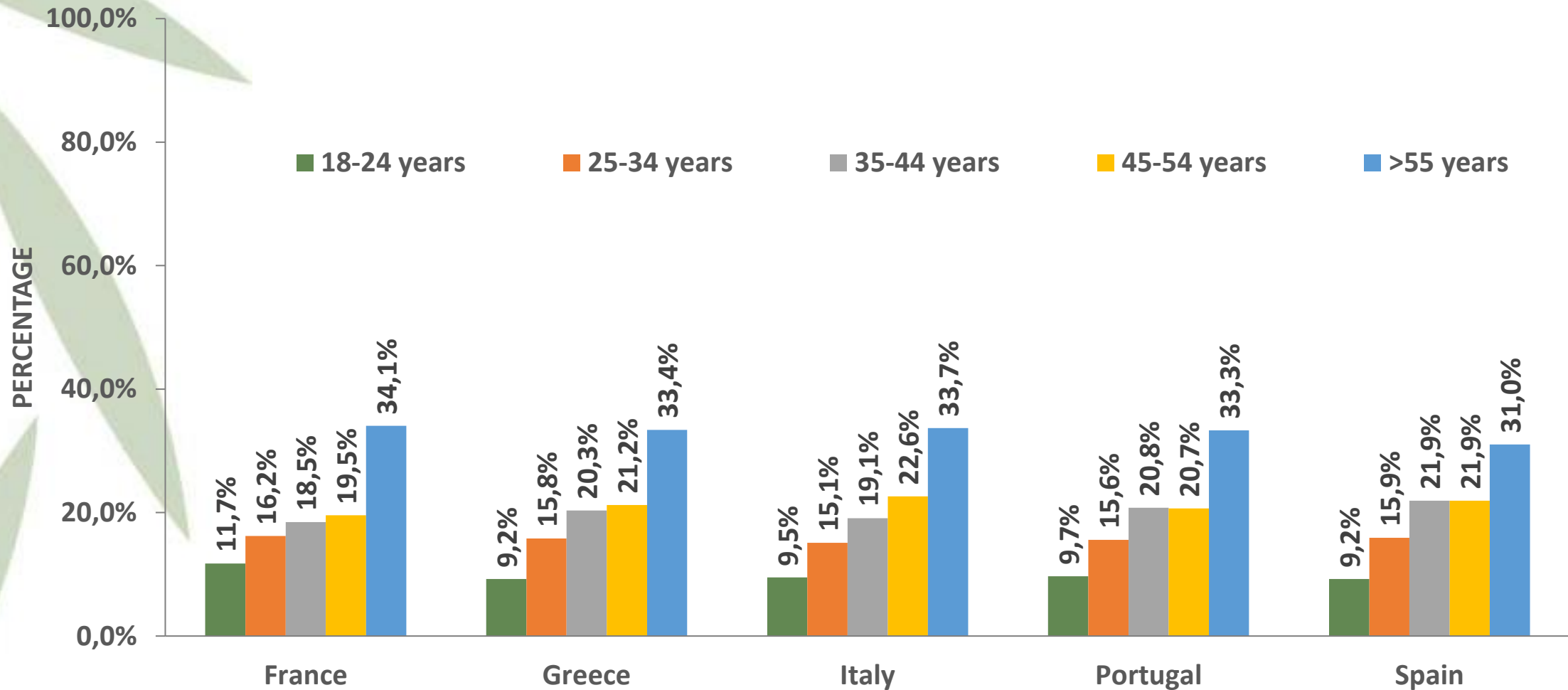
Gender



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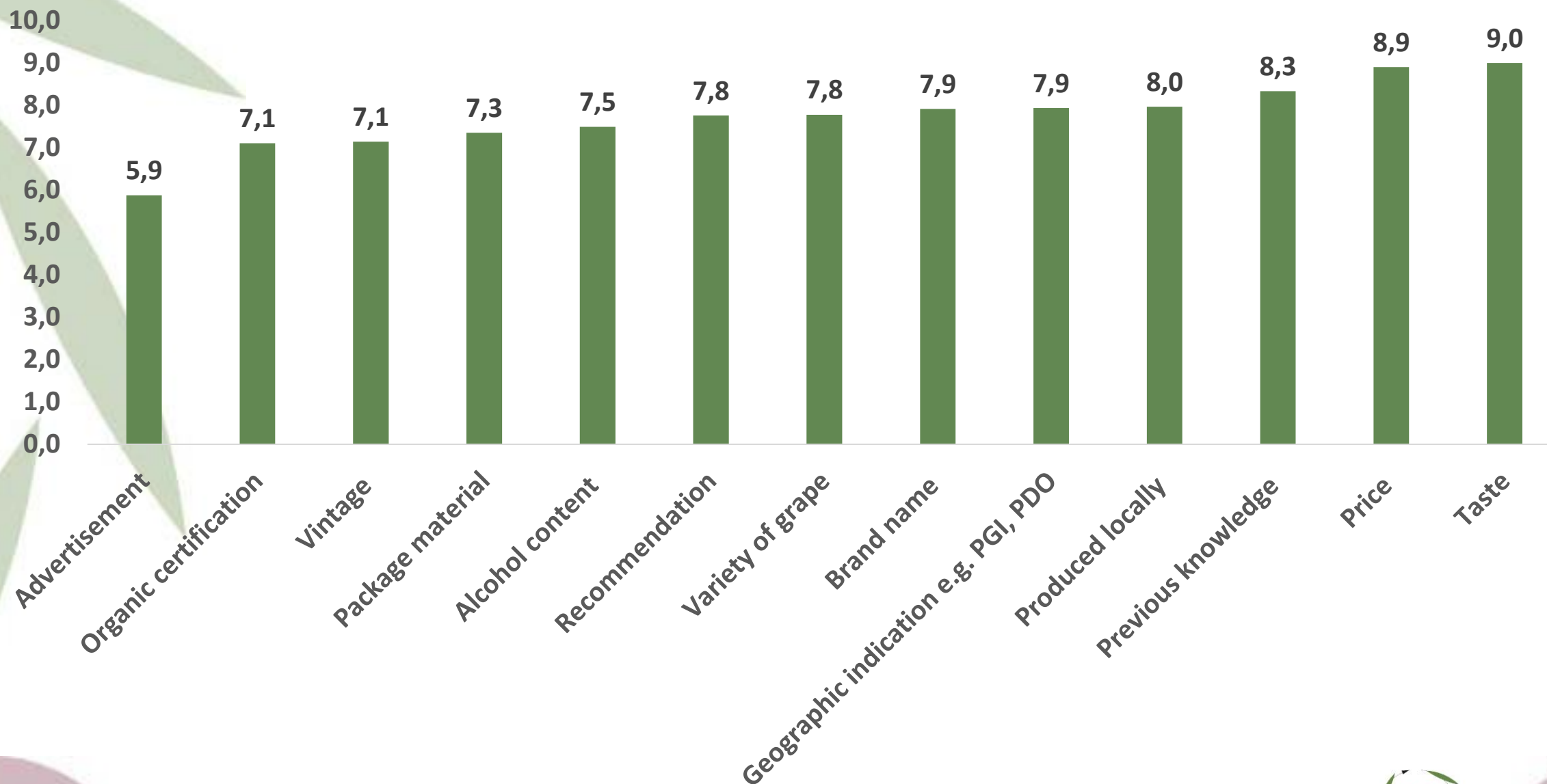
Age distribution



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Factors influencing purchase decisions among wine consumers

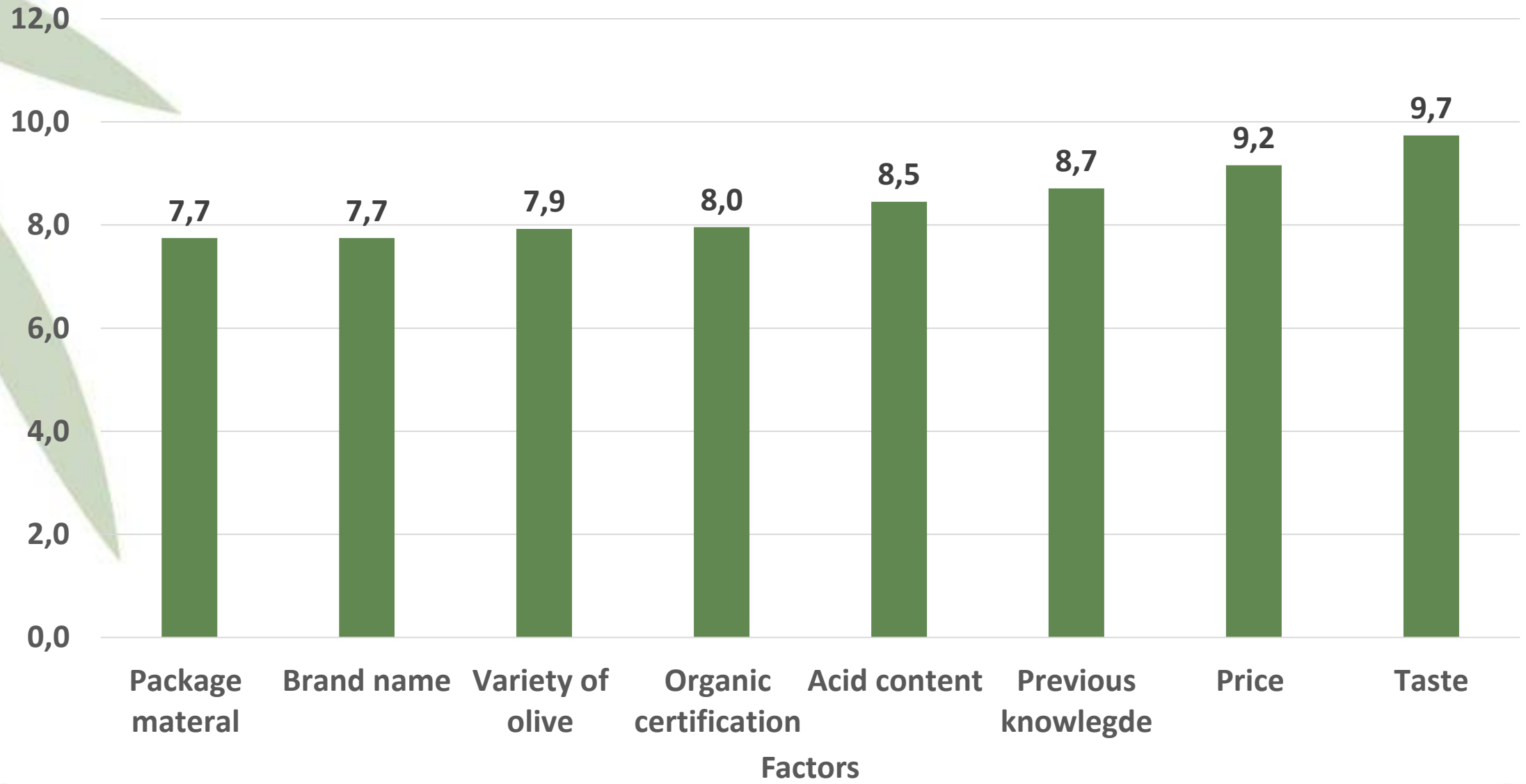


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Factors



Factors influencing purchase decisions among olive oil consumers



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Consumers WTP for products obtained from alternative innovation: WINE

ALL WINE CONSUMERS

A 1% reduction with INDEPENDENT certification	A 1% reduction with PARTICIPATORY certification	A 1% reduction with EU certification
5.06%*** (1.022)	2.96%** (1.119)	7.85%*** (1.124)
0.50% (1.175)	8.87%*** (1.312)	38.02%*** (2.575)
2.08% (1.703)	7.47%*** (1.978)	34.81%*** (3.742)
5.74%*** (1.125)	2.65%** (1.185)	28.13%*** (1.943)
-1.19% (1.073)	3.04%** (1.215)	26.59%*** (1.846)

*Standard errors in parentheses and ***, **, * ==> Significance at 1%, 5%, 10% level*



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WINE CONSUMERS WHO SAW SAMPLES OF THE ALTERNATIVE INNOVATION

	A 1% reduction with NO certification
France	0.65%*** (0.178)
Greece	2.09%*** (0.275)
Italy	2.11%*** (0.407)
Portugal	1.66%*** (0.213)
Spain	0.93%*** (0.230)

	A 1% reduction with NO certification
France	0.59%*** (0.146)
Greece	1.60%*** (0.136)
Italy	1.97%*** (0.263)
Portugal	1.34%*** (0.145)
Spain	0.70%*** (0.161)



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OLIVE OIL

Second stage regression of Heckman 2SLS: To predict value of WTP and the impact parameters

	France	Greece	Italy	Portugal	Spain
Knowledge of pesticide use	0.171*** (0.043)	0.293*** (0.047)	0.419 (0.261)	0.153*** (0.052)	0.166*** (0.055)
See innovation	0.013 (0.034)	0.033 (0.042)	0.225 (0.227)	0.036 (0.04)	0.056 (0.047)
Age	-0.085*** (0.02)	-0.011 (0.034)	0.037 (0.152)	-0.065*** (0.021)	0.003 (0.038)
Reference price (1L)	-0.017*** (0.003)	-0.022*** (0.003)	-0.053* (0.028)	-0.037*** (0.004)	-0.03*** (0.003)
Net monthly income	0.013 (0.013)	0.008 (0.024)	-0.07 (0.127)	0.052** (0.024)	-0.03 (0.025)
Constant	0.856*** (0.079)	0.898*** (0.111)	1.595** (0.625)	1.229*** (0.116)	1.404*** (0.114)
#Observations	753	743	792	703	666
R-squared	0.159	0.128	0.011	0.153	0.149
Av. bid (€/L)	4.986	4.978	6.201	3.880	4.152
Av. reference price (€/L)	11.028	9.121	8.700	6.201	7.317
Estimated Mean WTP (€/L)	1.543	1.315	0.724	0.882	1.325
WTP for 1 % pesticide reduction in olive grove	3.86%	3.29%	1.81%	2.21%	3.31%

Standard errors are in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Summary

CONSUMERS:

- ❑ Results show there is **potential acceptance for products obtained with different alternatives to contentious plant protection products.**
- ❑ WTP estimates show **significant increase when pesticide reduction increase** in particular with **EU certification**
- ❑ Results varies across countries and also depends on different consumers parameter.



Summary

FARMERS/STAKEHOLDERS:

- ❑ Results show that majority of farmers are **open to adopt the four selected alternative pesticide-reducing innovations.**
- ❑ Farmers' **attitudes, cost perceptions, familiarity with the alternative innovations, and the effectiveness of their existing treatment methods** play crucial roles in their adoption decision-making.
- ❑ Interventions aimed at promoting the adoption of pesticide-reducing innovations should address these crucial factors



IRTA

RECERCA | TECNOLOGIA
AGROALIMENTÀRIES



CREDA

CENTRE DE RECERCA EN ECONOMIA
I DESENVOLUPAMENT AGROALIMENTARI

Q&A

Many Thanks!

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Task 5.3 Developing and testing of web-based tool with indicators for measuring the impact of crop management and protection on different compartments: human health, air, water, soil, biodiversity, energy.

Task Leader: HORTA; Partners Involved: ALL PARTNERS; Task duration: M30-M48

A set of sustainability indicators concerning vineyard management practices were developed within the INNOVINE project (FP7-KBBE-2012, GA 311775) to address the following aspects: Human Health, Air, Soil, Water, Energy and Biodiversity. These indicators were implemented into a web-based DSS (vite.net) provided by Horta.

Starting from this background, **indicators will be selected to properly address innovative strategies designed in WP2, WP3 and WP4 both for vineyards and olive groves** such as, for instance, PEF (Product Environmental Footprint) and pesticide impact mitigation indicators. **Indicators to address social and economic aspects** (coming from task 5.2) will be also implemented.

A stand-alone web-based tool will be then developed to collect all data requested, calculate the indicators and provide clear-to-understand outputs about environmental, social and economic impacts of the tested strategies.

The tool will be finally used to evaluate integrated global solutions for effective and adapted IPM designed in task 5.1.



Task 5.3 Developing and testing of web-based tool with indicators for measuring the impact of crop management and protection on different compartments: human health, air, water, soil, biodiversity, energy.

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ELENCO UP

Nuova UP Filtra Esporta dati

Tutte le specie Tutte le colture Novaterra Tutte le aziende 2024

Mostra 15 elementi 1 Cerca:

Gestione	ID	Utente	Azienda	Descrizione	Stazione meteo	Nazione	Coltura	Varietà	Data scadenza	Funzionalità
   	241837	Novaterra	SOGRAPE VINHOS. S.A.	grape SOGRAPE_innovative wp4	Tabuaço loc. Do Seixo (virtuale) (PT)	Portugal	Vite da vino	Vite (generico)	31/12/2024	 
   	241836	Novaterra	SOGRAPE VINHOS. S.A.	grape SOGRAPE_conventional2 wp4	Tabuaço loc. Do Seixo (virtuale) (PT)	Portugal	Vite da vino	Vite (generico)	31/12/2024	 
   	241835	Novaterra	SOGRAPE VINHOS. S.A.	grape SOGRAPE_conventional1 wp4	Tabuaço loc. Do Seixo (virtuale) (PT)	Portugal	Vite da vino	Vite (generico)	31/12/2024	 
   	241833	Novaterra	SOGRAPE VINHOS. S.A.	grape SOGRAPE_innovative wp3	Tabuaço loc. Do Seixo (virtuale) (PT)	Portugal	Vite da vino	Vite (generico)	31/12/2024	 
   	241831	Novaterra	SOGRAPE VINHOS. S.A.	grape SOGRAPE_conventional wp3	Tabuaço loc. Do Seixo (virtuale) (PT)	Portugal	Vite da vino	Vite (generico)	31/12/2024	 
   	241830	Novaterra	SOGRAPE VINHOS. S.A.	grape SOGRAPE_innovative wp2	Tabuaço loc. Do Seixo (virtuale) (PT)	Portugal	Vite da vino	Vite (generico)	31/12/2024	 
   	241829	Novaterra	SOGRAPE VINHOS. S.A.	grape SOGRAPE_conventional wp2	Tabuaço loc. Do Seixo (virtuale) (PT)	Portugal	Vite da vino	Vite (generico)	31/12/2024	 
   	241826	Novaterra	Myrolion	olive Myrolion_innovative	Almyros loc. Glifas (virtuale) (GR)	Ελλάδα (Greece)	Olivo a duplice attitudine	Aglandau	31/12/2024	 
   	241825	Novaterra	Myrolion	olive Myrolion_conventional	Almyros loc. Glifas (virtuale) (GR)	Ελλάδα (Greece)	Olivo a duplice attitudine	Aglandau	31/12/2024	 
   	241823	Novaterra	Jordi Caballé	olive IRTA_innovative	Santa Bàrbara loc. Calig (virtuale) (ES, Tarragona)	España	Olivo da olio	Aglandau	31/12/2024	 
   	241822	Novaterra	Jordi Caballé	olive IRTA_conventional	Santa Bàrbara loc. Calig (virtuale) (ES, Tarragona)	España	Olivo da olio	Aglandau	31/12/2024	 
   	241818	Novaterra	Casa Santo Amaro	olive IPB_innovative	Barreiros loc. Coira (virtuale) (ES, Lugo)	Portugal	Olivo da olio	Aglandau	31/12/2024	 
   	240037	Novaterra	Casa Santo Amaro	olive IPB_conventional	Barreiros loc. Coira (virtuale) (ES, Lugo)	Portugal	Olivo da olio	Aglandau	31/12/2024	 



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Task 5.3 Developing and testing of web-based tool with indicators for measuring the impact of crop management and protection on different compartments: human health, air, water, soil, biodiversity, energy.

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GRAPE SOGRAPE_INNOVATIVE WP4
NOVATERRA (SOGRAPE VINHOS, S.A.)

EditUndo

General

User	Novaterra
Description	grape SOGRAPE_innovative wp4
Surface (ha)	0.3
Farm	SOGRAPE VINHOS, S.A.
Country	Portugal
Region	Norte
Province	Braga
Weather station	Tabuaço loc. Do Seixo (virtuale) (PT)
Latitude	41.165911
Longitude	7.553269
Expected yield (t/ha)	3.5
Field slope	Pendenza molto forte (31-40%)

Cropping system layout setting

Characteristics of soil

Water balance and irrigation

Sustainability

Pesticide Risk Mitigation Measures

*= Value is required.

EditUndo

Task 5.3 Developing and testing of web-based tool with indicators for measuring the impact of crop management and protection on different compartments: human health, air, water, soil, biodiversity, energy.

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GRAPE SOGRAPE_INNOVATIVE WP4

NOVATERRA (SOGRAPE VINHOS, S.A.)

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Agricultural operation list

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			Date	Operation type	Description
✎	🗑️	📄	29/09/2023	Harvesting	Harvested area extension: 0.3 ha
✎	🗑️	📄	29/09/2023	Deliver	Carried quantity: 0.77 t
✎	🗑️	📄	03/07/2023	Treatment	Powdery mildew, Downy mildew (Cuprital SC - Sapec Agro , Collis - Basf Portugal)
✎	🗑️	📄	21/06/2023	Combined actions	Inter-row and on row grass mowing
✎	🗑️	📄	19/06/2023	Treatment	Downy mildew, Powdery mildew (RIDOMIL GOLD COMBI PÉPITE - Adama Portugal, Thiovit Jet - Syngenta Portugal, Vivando - Basf Portugal)
✎	🗑️	📄	05/06/2023	Treatment	Powdery mildew, Downy mildew (Collis - Basf Portugal, Thiovit Jet - Syngenta Portugal, Melody - Bayer Portugal Lda.)
✎	🗑️	📄	24/05/2023	Treatment	Downy mildew, Powdery mildew (RIDOMIL GOLD COMBI PÉPITE - Adama Portugal, Prosper - Bayer Portugal Lda., Thiovit Jet - Syngenta Portugal)
✎	🗑️	📄	09/05/2023	Treatment	Downy mildew, Powdery mildew (Thiovit Jet - Syngenta Portugal, Cabrio Top - Basf Portugal, Topaze - Syngenta Portugal)
✎	🗑️	📄	05/05/2023	Combined actions	Inter-row and on row grass mowing
✎	🗑️	📄	19/04/2023	Inter-row management	Grass mowing



Task 5.3 Developing and testing of web-based tool with indicators for measuring the impact of crop management and protection on different compartments: human health, air, water, soil, biodiversity, energy.

Human health



1. Human Tox Score
2. Dose Area Index
3. Treatment Frequency Index

Biodiversity



11. Bbiodiversity indicator (Unilever)
12. Eco Tox score

Air



4. Carbon foot print
5. CO2 Carbon sequestration

Energy



13. Fuel use
14. Renewable fuel
15. Waste

Soil



6. Ecological foot print
7. Organic matter
8. Soil coverage
9. Erosion
10. Soil compaction

Water



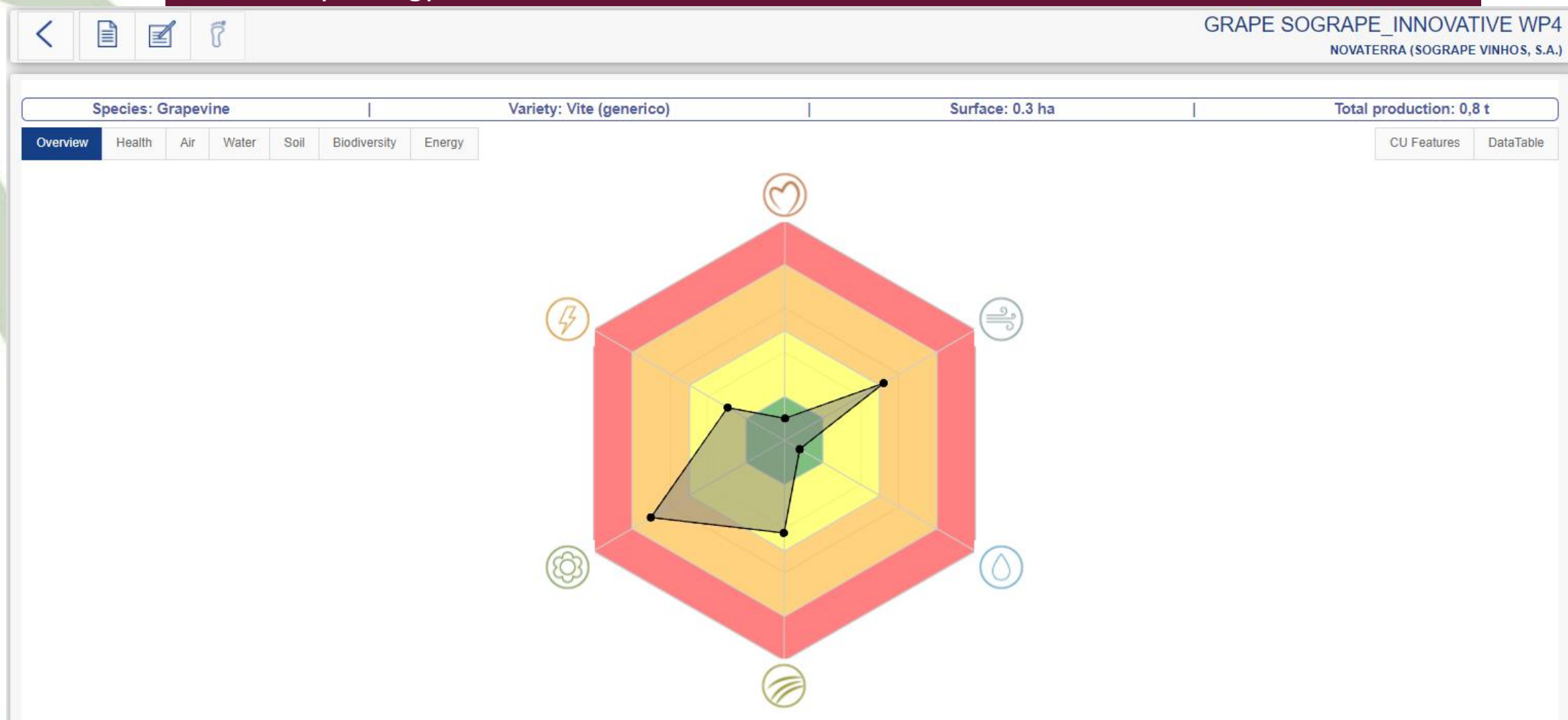
16. Water foot print (Grey, Blue & Green water)
17. Water supply
18. Water Use Tech efficiency
19. Acidification
20. Eutrophication



Task 5.3 Developing and testing of web-based tool with indicators for measuring the impact of crop management and protection on different compartments: human health, air, water, soil, biodiversity, energy.

GRAPE SOGRAPE_INNOVATIVE WP4					
NOVATERRA (SOGRAPE VINHOS, S.A.)					
Species: Grapevine		Variety: Vite (generico)		Surface: 0.3 ha	
				Total production: 0,8 t	
Overview	Health	Air	Water	Soil	Biodiversity
					CU Features
					DataTable
Compartment	Score (0-5)	Mitigation Benefits	Value	Measurement Unit	
Health	0,5	0,5 (N/A)			
Human Tox Score (HTS)	0,0		45,2	-	?
Dose Area Index (DAI)	1,0		8,3	-	?
Treatment Frequency Index (TFI)	1,0		14	-	?
Air	2,6				
Carbon Footprint (CF)	2,0		0,278	t CO2 eq/t of production	?
Carbon Sequestration	5,0		0,591	t of Carbon/ha	?
Soil	2,1				
Ecological Footprint (EF)	5,0		1,057	global ha/t of production	?
Organic Matter	4,0		1,4	%	?
Soil Coverage	2,0		256	days	?
Erosion	1,0		24,8	t soil/ha	?
Soil compaction	1,0		1,2	-	?
Biodiversity	3,5	3,5 (N/A)			
Biodiversity	5,0		0	-	?
Eco Tox Score (ETS)	0,0		52,1	-	?
Energy	1,5				
Fuel use	0,0		73,7	l of fuel/ha	?
Renewable fuel	5,0		-	-	?
Waste	1,8		1,8	-	?
Water	0,4				
Water Footprint	1,0		1.375	m3 of water/t of production	?
Water supply	0,0		0	-	?
Water Use Technical Efficiency	0,0		0	-	?
Acidification	0,0		0,002	SO2 eq t/t of production	?
Eutrophication	0,0		0	PO4 eq t/t of production	?

Task 5.3 Developing and testing of web-based tool with indicators for measuring the impact of crop management and protection on different compartments: human health, air, water, soil, biodiversity, energy.



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PEF Impact categories



- ❖ CLIMATE CHANGE
- ❖ OZONE DEPLETION
- ❖ HUMAN TOXICITY – NON-CANCER EFFECTS
- ❖ HUMAN TOXICITY – CANCER EFFECTS
- ❖ RESPIRATORY INORGANICS
- ❖ IONIZING RADIATION HH
- ❖ PHOTOCHEMICAL OZONE FORMATION
- ❖ ACIDIFICATION
- ❖ TERRESTRIAL EUTROPHICATION
- ❖ FRESHWATER EUTROPHICATION
- ❖ MARINE EUTROPHICATION
- ❖ FRESHWATER ECOTOXICITY
- ❖ LAND USE
- ❖ WATER SCARCITY/USE
- ❖ RESOURCE USE – ENERGY CARRIERS
- ❖ RESOURCE USE – MINERAL AND METALS



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Task 5.3 Developing and testing of web-based tool with indicators for measuring the impact of crop management and protection on different compartments: human health, air, water, soil, biodiversity, energy.

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GRAPE SOGRAPE_INNOVATIVE WP4
 NOVATERRA (SOGRAPE VINHOS, S.A.)

Species: Grapevine

Variety: Vite (generico)

Surface: 0.3 ha

Total production: 0,8 t

Overview

Health

Air

Water

Soil

Biodiversity

Energy

CU Features

DataTable

PEF Indices

?

Climate change per hectare (kg CO ₂ eq/ha):	625.19
Climate change per hectare [production] (kg CO ₂ eq/ha):	475.47
Climate change per hectare [field] (kg CO ₂ eq/ha):	149.72
Climate change per hectare [inhibitors] (kg CO ₂ eq/ha):	625.19
Climate change per hectare [inhibitors] [production] (kg CO ₂ eq/ha):	475.47
Climate change per hectare [inhibitors] [field] (kg CO ₂ eq/ha):	149.72
Climate change per product ton (kg CO ₂ eq/t):	245.17
Climate change per product ton [production] (kg CO ₂ eq/t):	186.46
Climate change per product ton [field] (kg CO ₂ eq/t):	58.72
Climate change per product ton [inhibitors] (kg CO ₂ eq/t):	245.17
Climate change per product ton [inhibitors] [production] (kg CO ₂ eq/t):	186.46
Climate change per product ton [inhibitors] [field] (kg CO ₂ eq/t):	58.72
Climate change, fossil per hectare (kg CO ₂ eq/ha):	623.33
Climate change, fossil per hectare [production] (kg CO ₂ eq/ha):	473.6
Climate change, fossil per hectare [field] (kg CO ₂ eq/ha):	149.72
Climate change, fossil per hectare [inhibitors] (kg CO ₂ eq/ha):	623.33
Climate change, fossil per hectare [inhibitors] [production] (kg CO ₂ eq/ha):	473.6

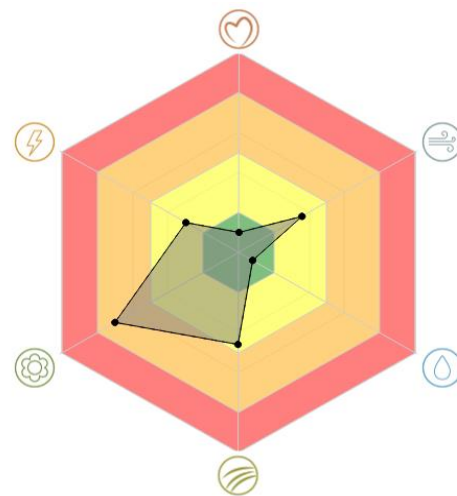
Task 5.3 Developing and testing of web-based tool with indicators for measuring the impact of crop management and protection on different compartments: human health, air, water, soil, biodiversity, energy.

Task Leader: HORTA; Partners Involved: ALL PARTNERS; Task duration: M30-M48

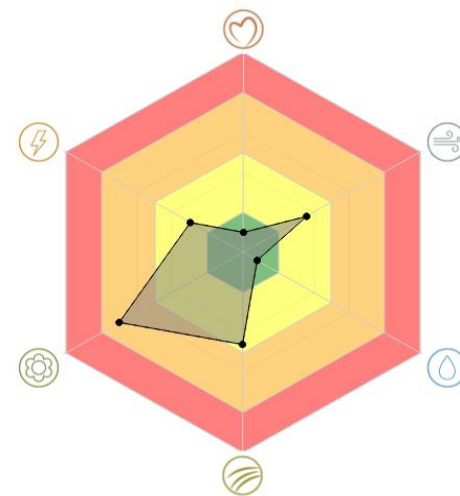
Indicators will be selected to properly address and valorize innovative strategies designed in WP2, WP3 and WP4 both for vineyards and olive groves

SOGRAPE GRAPEVINE PORTUGAL

CONVENTIONAL wp3



INNOVATIVE wp3



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