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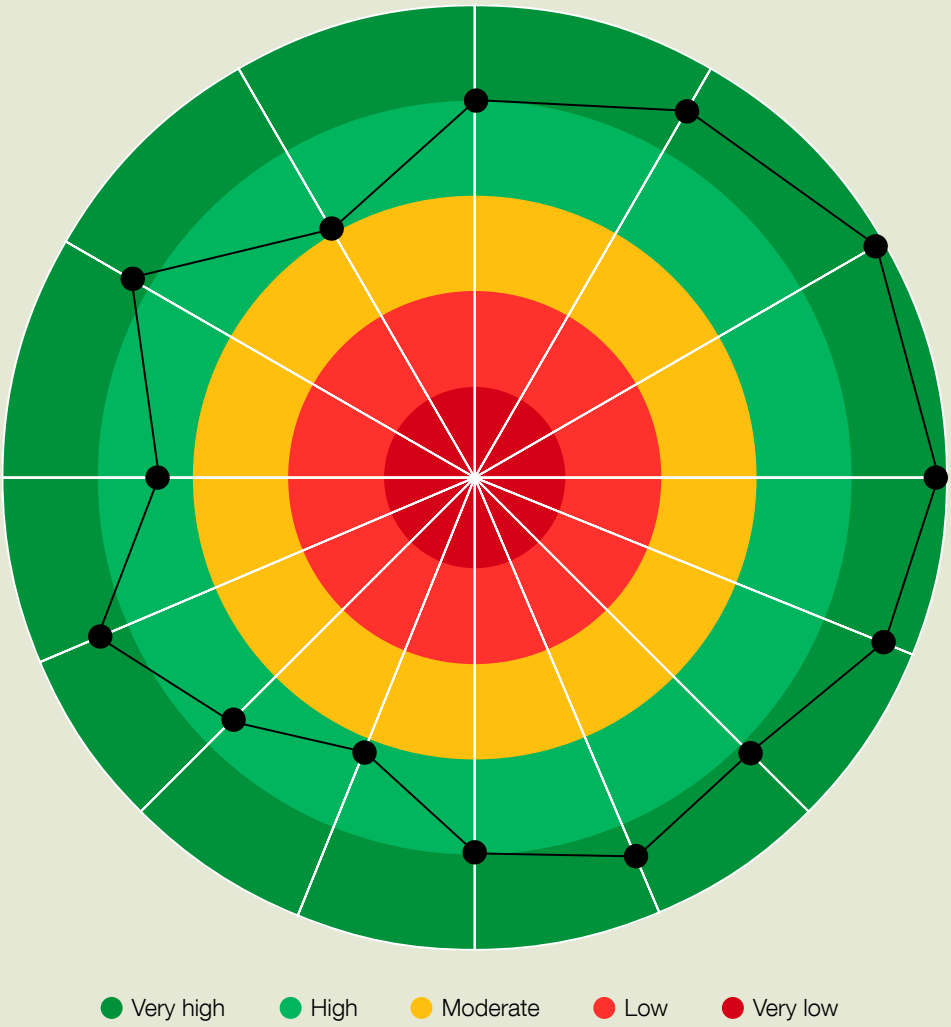
DossierTècnic

Innovation and Knowledge Transfer

March 2026



Sustainable Agricultural Production (PAS)

Generalitat de Catalunya
RuralCat

Sustainable Agricultural Production (PAS from its initials in Catalan) is a model capable of evaluating, classifying and recognising Catalan farms according to their level of sustainability, from a triple perspective: environmental, economic and social.

Current production models require a transformation towards more agro-ecological systems, which allow us to continue producing food, while preserving natural resources and responding to the new challenges arising from climate change. Each farm, depending on its possibilities and its starting point, will have a more or less long journey towards sustainability and it is important that all of them have a place in it.

One of the most outstanding aspects of Sustainable Agricultural Production (PAS) is that it is a model capable of evaluating, classifying and recognising Catalan farms according to their level of sustainability, from a triple perspective: environmental, economic and social. This evaluation is carried out objectively and quantitatively, and becomes an opportunity for the agricultural sector, as it allows the work carried out in terms of sustainability to be assessed. Thus, it is demonstrated that food production, the conservation of natural resources and the achievement of economic and social goals must, indisputably, go hand in hand. In addition, the possibility of accessing public and voluntary certification will allow products from sustainable farms to be differentiated.

This commitment to a more efficient, resilient and environmentally friendly agriculture is based, first and foremost, on the application of sustainable agricultural practices that seek to improve soil health, make rational use of water and fertilisers, promote biodiversity and reduce polluting emissions, among other objectives. Secondly, it is based on the availability of a digital tool —the sustainability calculator— which, based on the introduction of initial data, offers farms a detailed evaluation in the form of a sustainability report. This document includes the sustainability profile of the operation, the calculation of the environmental footprint of the product and its classification according to the level of sustainability. This tool is key to taking advantage of digitalisation in agricultural management, making better decisions and identifying strengths and weaknesses in sustainability. It also allows farms to compare themselves with similar ones and find out their positioning.

This *Technical Dossier* presents all the work done so far around the SAP project, shows how digitalisation, well channelled, can be a key piece in managing the sustainability of farms, facilitates the interpretation of sustainability reports, including an interview with the European Commission's Policy and Eco-Regimes Coordinator. In short, the document aims to show the path taken so far and invite all agents in the agricultural sector to move towards a common goal: to build a more sustainable, resilient Catalan agriculture aligned with the principles of agroecology.

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SUSTAINABILITY
and the agricultural sector

Global Sustainable Agricultural Production. Photo: DARPA, with background image from Pixabay.

The United Nations Brundtland Report, in 1987, defined sustainable action as that which allows "to meet the needs of the present generation without compromising the ability of future generations to meet their own needs". It is a good definition because it emphasises what is essential without any concessions to nuances. As the poet said, what is good, if short and simple, is even better. It is sustainable if it does not compromise the future, but the concept of sustainability is also linked to the satisfaction of present needs. The definition already distances us from idealistic formulations that, while imagining dreams of the future, forget about the basic needs of every day, of everyone's present.

The word *sustainable* has burst onto the collective stage at the same moment in which we have become aware of the harm we have caused and continue to cause to our natural environment. It has become clear that we were and are disrupting ecosystem balances, destroying biodiversity and awakening the Leviathan of climate change, which puts our future and that of new generations at risk.

> We must guarantee the future of our planet and that of future generations.

However, as quickly as we were aware of the problem, we felt the need to exonerate ourselves. We have been more hasty in rejecting our responsibility than in seriously addressing the efforts needed to rectify the situation. Thus, the word 'sustainable' is the one that absolves us of guilt; it is the coveted word that points to our climate and environmental innocence. Practices are sometimes hidden behind this word that are nothing more than exculpatory window dressing. In part, the word *sustainable* has been the mother of all *greenwashing*. Industries with the highest greenhouse gas (GHG) emissions have been able to proclaim their environmental goodness if they have paid the cost of supposedly environmentally beneficial measures. In other words, the most polluting companies have been able to continue polluting, without a bad conscience, while hiding their worst practices behind the word *sustainable*. However, the price of exculpation (climate credits or carbon tax) has been a beneficial practice for giving impetus to transformative measures in critical environments.

Sustainability, however, is not a dichotomous characteristic. It is not true that either you are sustainable or you are not. Nevertheless, sustainability is often expressed in this way to demonstrate the same level of excellence or, alternatively, to classify others as generically unsustainable based on certain specific choices that are considered inadequate. However, this binary way of using the concept of being *sustainable* distances us from reality and makes the word lose its power. Sustainability is a goal and not a position. Actions, people and companies can be more

or less sustainable. They are not sustainable or unsustainable, as a quality that determines them. Sustainable development is a process of continuous improvement. For this reason, we must avoid the "owners" of sustainability and, on the contrary, trust in the builders of sustainability, those who, out of humility, make the greatest efforts towards this objective, given the greatness and complexity of the challenge.

PAS can measure the agroecological transition of Catalan farms.

Our purchasing actions have a great impact on sustainability.

Indeed, sustainability is a concept necessarily associated with complexity. In relation to the world of food, complexity is determined by the need to optimally manage a set of at least five vectors. First of all, the process of producing, transforming, distributing and consuming food must be kind and respectful to the environment. Secondly, it must be able to produce food for everyone, that is, it must meet the global demand for food. Thirdly, food must be affordable for everyone. In this regard, price becomes of significant importance and its distortions become an undesirable risk. Obviously, behind this vector lies chronic and unjust inequality. Fourthly, all operators in the food chain must be able to receive adequate remuneration. Fifthly and finally, all foods must meet impeccable health values, given that food is a key vector of human health. All these vectors are not pipedreams, they are the reality of human needs. Hence the complexity. Satisfying all five vectors to a degree of excellence is not possible and we must be aware of this. These vectors are not aligned. For example, paying farmers better does not necessarily mean better food prices. Or, another example, scrupulously and exhaustively attending to all the most environmentally-friendly practices does not mean that more food is produced in accordance with global demand. Inevitably, managing complexity requires tolerance and acceptance of the best of all possible options, but not the best for each and every objective.

Sustainable Agricultural Production. Source: DARPA.

Among the proposals for progress towards a sustainable world, here in Catalonia we have the impetus of the Department of Agriculture, Livestock, Fisheries and Food (DARPA) and the Institute of Agro-Food Research and Technology (IRTA) which, together, have proposed the SAP (Sustainable Agricultural Production) initiative. This is a good way to approach the issue. Below are details on some of the unique characteristics of the proposal.

- It is a tool and does not claim to be any more than that. PAS is introduced as a tool that can help agricultural companies to move more effectively towards the goal of sustainability.
- Science and technology. Management and improvement options arise from science and technology. PAS avoids overly ideological approaches. The IRTA accompanies PAS with its definition and development.
- Agroecology. Agroecology brings the knowledge of scientific ecology to agricultural production. In other words, through agroecology we take advantage of nature's teachings for agricultural production that prioritises environmental balances.
- Continuous improvement. PAS is not an end goal, it is a path towards the goal.
- Open proposal. PAS is not a set of strict rules that needs to be complied with, it is a proposal that is open to the possible set of practices and uses that are favourable to the mitigation, adaptation and improvement of climate change and respect for biodiversity.
- Multiple-option. PAS offers multiple ways and means of carrying out the activity of producing food. For each option, it points out the advantages and disadvantages. PAS users will have to evaluate and adopt the package of options that best brings them closer to achieving the different sustainability objectives.
- Comparability. A key tool for continuous improvement is the ability to compare the same results with those of a broader set of equivalent characteristics. PAS offers this possibility.
- School of best practice. PAS informs about the different paths of improvement and, in this regard, becomes a school of good production practices in accordance with environmental, social and economic requirements.
- Towards a globally accepted certification. Doing things well must have a reward to compensate for the effort involved in achieving this difference. A reward that can come from positive discrimination in public support or, simply, from a better verdict on the product by the conscious consumer. However, in order to identify quality values, globally accepted certification is required.
- Measurement of different degrees of improvement. PAS incorporates a calculator that evaluates the different improvement results achieved. At the same time, it identifies several categories, based on the different degrees of progress achieved. Comparing the different degrees of im-

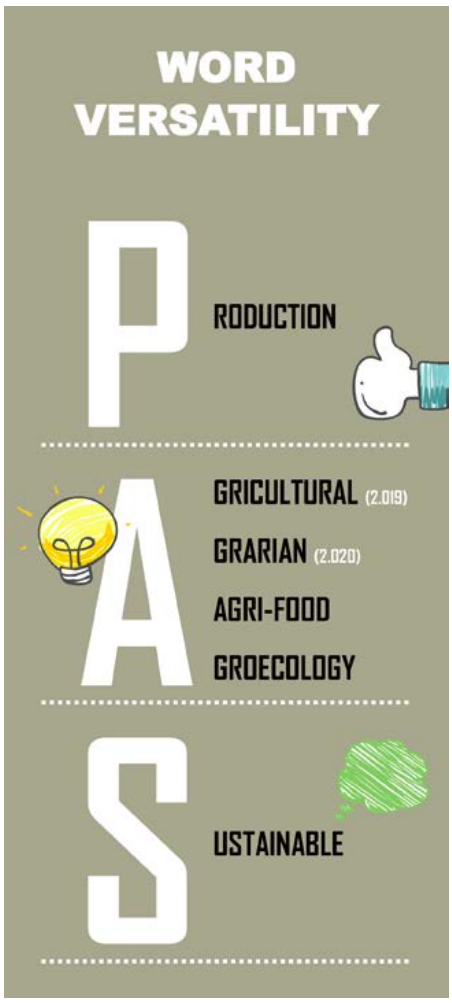
provement in relation to the professional environment becomes a clear stimulus for progress.

- TAPE (*Tool for the Agroecology Performance Evaluation*). PAS is a tool within the framework of the FAO's TAPE proposals to measure the level of progress towards the agroecological transition. That is, it should consider the balance between the global and multidimensional sustainability of demands. That includes, among others, energy, biota with all its biodiversity, the quality of air, water and soil, and the human population as a demander of food and other products and services.

The implementation of the PAS system for the development of agriculture and livestock farming is not an easy path to take. The difficulties of implementing PAS are focused, above all, on four points: global take-up of the project, visualisation of the advantages, quality of the digital information system and, finally, empathy and dialogue among different proposals aimed at the goal of sustainability.

Overall take-up of the project. This project would lack value if it were not representative of a broad economic-social-environmental space. Ideally it should become a European proposal. It is possible that similar proposals will emerge from other parts of Europe. It would therefore be necessary to find forms of convergence to achieve the objective of globality and prestige that would facilitate recognition in the professional environment.

Visualisation of the advantages. The adoption of the PAS system will depend on agricultural companies receiving compensation for the additional efforts linked to more sustainable practices. This compensation, in part, may come from public funds, basically from the CAP. But it is essential that the chain's business environment and, above all, consumers are able to value the environmental quality that PAS expresses.



Versatility of the acronym PAS. Source: DARPA, with background images from Pixabay.

Quality of the digital information system. Agricultural companies cannot spend even an extra second of their time on bureaucratic or information tasks. The PAS system must be fed automatically on data from the integrated agricultural information system. This requires that this Catalan agricultural information system be very well organised and very well integrated and managed with a humble attitude of service. At the same time, good training of system users will be required to achieve sufficient and necessary qualifications on the digital tools in use.

Empathy and dialogue among different proposals aimed at the goal of sustainability. Concern about environmental imbalance and climate change has driven a set of diverse proposals: integrated production, organic or ecological production, regenerative agriculture, etc. All of them seek environmental improvement, with greater or lesser success in their approaches and results.

The PAS system is an open, flexible, inclusive model based on the analysis of reality coming from science and technology. In this regard, the PAS system, from the point of view of this author, should be the path occupying the central role and should point the way for the confluence of the different proposals. Some movements disregard the set of vectors linked to the production, transformation and consumption of food and focus only on the objective of sustainability, as if this objective were possible by uprooting it from the other vectors of demand, quality, affordability, viability, etc.

The path towards sustainability necessarily requires science and technology. For example, a key objective such as reducing or avoiding the use of phytosanitary products without compromising production has multiple agroecological options largely stemming from new knowledge (use of pheromones, predators, biocontrol fungi, etc.), but it can also have developments in genomics to obtain plants that are resistant to this particular pest.

PAS is a promising initiative created in Catalonia that clearly deserves our support. It is time to put this model on the table of good decisions at the European level.

Authors

Francesc Reguant Fosas
Economist.
Chair of the Agri-Food Economy Committee of the College of Economists of Catalonia.
francesc@reguant.cat

PRODUCTION SYSTEMS in Catalonia

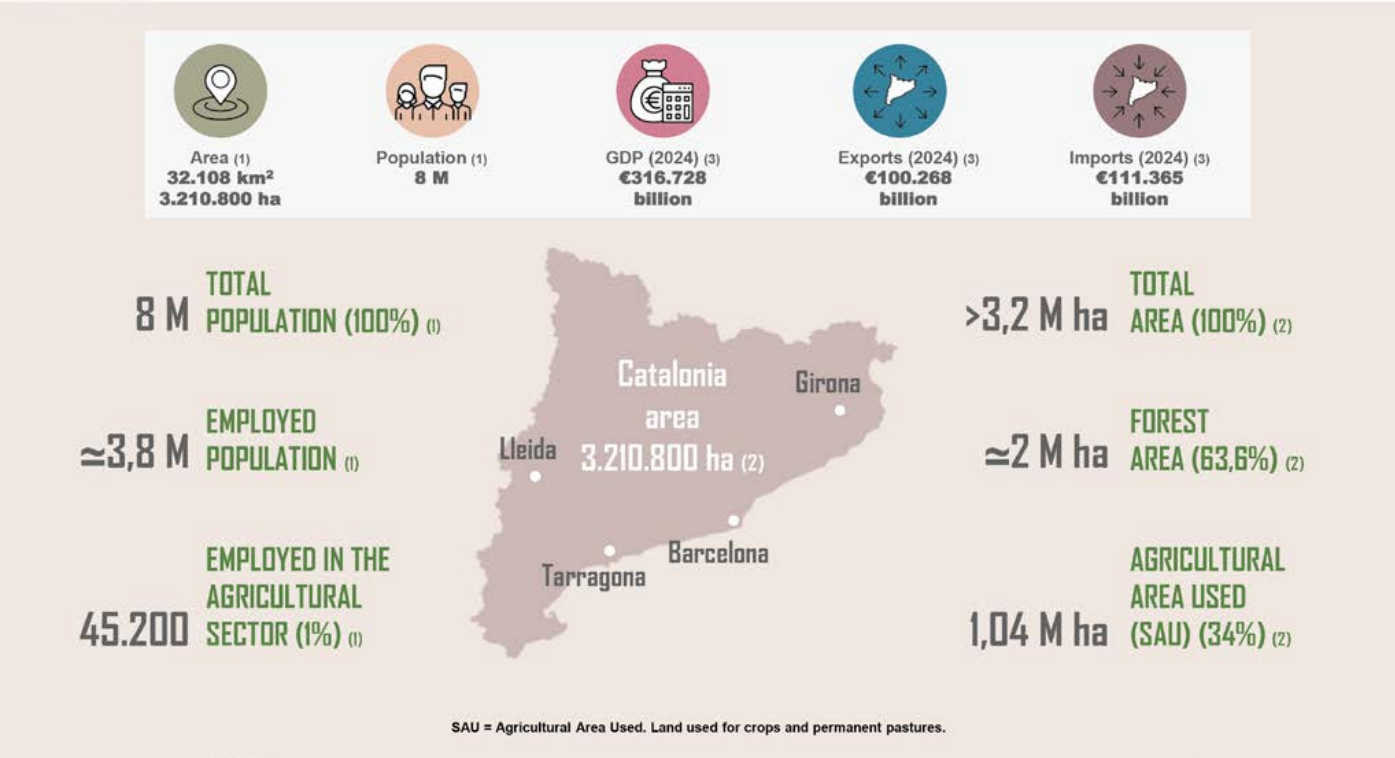


Figure 1. *Catalonia, in figures. Source: (1) Idescat. Employed population 2024. (2) Idescat, Land use 2023. (3) Idescat. Annual financial accounts 2024.*

01. Characteristics of the Catalan agricultural sector

Catalonia is a territory with exceptional agro-climatic diversity that gives it high productive wealth. The agricultural sector is strategic for land management, food production and the preservation of biodiversity, but it faces structural and emerging challenges: irregular water availability, extreme climatic episodes, urban pressure, lack of generational renewal and volatility of an increasingly unbalanced global food system.

Climate change accentuates these risks: temperature changes, irregular rainfall, increased droughts, floods and heat waves, erosion and loss of soil fertility, as well as the appearance of new pests and plant and animal diseases. All of this compromises the ability to produce food under appropriate conditions and endangers future food security. Faced with this scenario, the resilience and adaptation of the sector are essential to guarantee its viability in the medium and long term.

Catalonia has an area of more than 3.2 million hectares and a population of 8 million inhabitants. Of this surface, 63.6%[1] is forest (approximately 2 million hectares), 25.7% is cropland; 6.8% is urban land, developable land and infrastructure, and 3.9% are areas without vegetation. The utilised agricultural area (UAA)[2] in Catalonia is 1,040,951 hectares, representing 34% of the total area (Fig. 1).

Of the employed population of 3.8 million, only 45,200 people work in the agricultural sector (1% of the total), and, in the economic field, Catalonia's GDP in 2024 was €316.73 billion, with

[1] The forest area includes wooded forest area (occupied by forests and tree plantations); woodlands (occupied by maquis, garrigues, scrub, heathland, shrubs, thickets, and with transition situations between the forest and the thicket), and the areas with other vegetation (such as meadows, pastures, grasslands, wetland vegetation and grazed heathland). Crops include land sown with plantations of annual or perennial species (herbaceous and woody crops, both dry and irrigated) and fallow land. Areas without vegetation include bare soil, rocky outcrops, escarpments, screes, ravines, sandbanks, beaches, marshes, lakes, reservoirs and rivers. The urbanised territory and infrastructure correspond to the land occupied by urban centres, low-density urban areas, industrial and commercial areas, and road infrastructure. [2] The utilised agricultural area (UAA) is the agricultural area used that corresponds to a specific part of the total agricultural area. It includes only land effectively used for crops and permanent pastures.

exports and imports of €100.27 billion and €111.37 billion respectively, according to data from IDESCAT (Fig. 1).

Agriculture and livestock farming in Catalonia are the result of a long historical trajectory and social and institutional support that has allowed the productive sectors to evolve to become what they are today, a mosaic of diverse systems, adapted to the territory, environmental conditions and market demands.

The agricultural sector is very diverse and has different production models that adapt to the needs and realities of each territory. We can find everything from conventional production to certified systems such as Integrated Production (PI), organic agri-food production (PAE) and Sustainable Agricultural Production (PAS), all of which are promoted by the Department of Agriculture, Livestock, Fisheries and Food (DARPA).

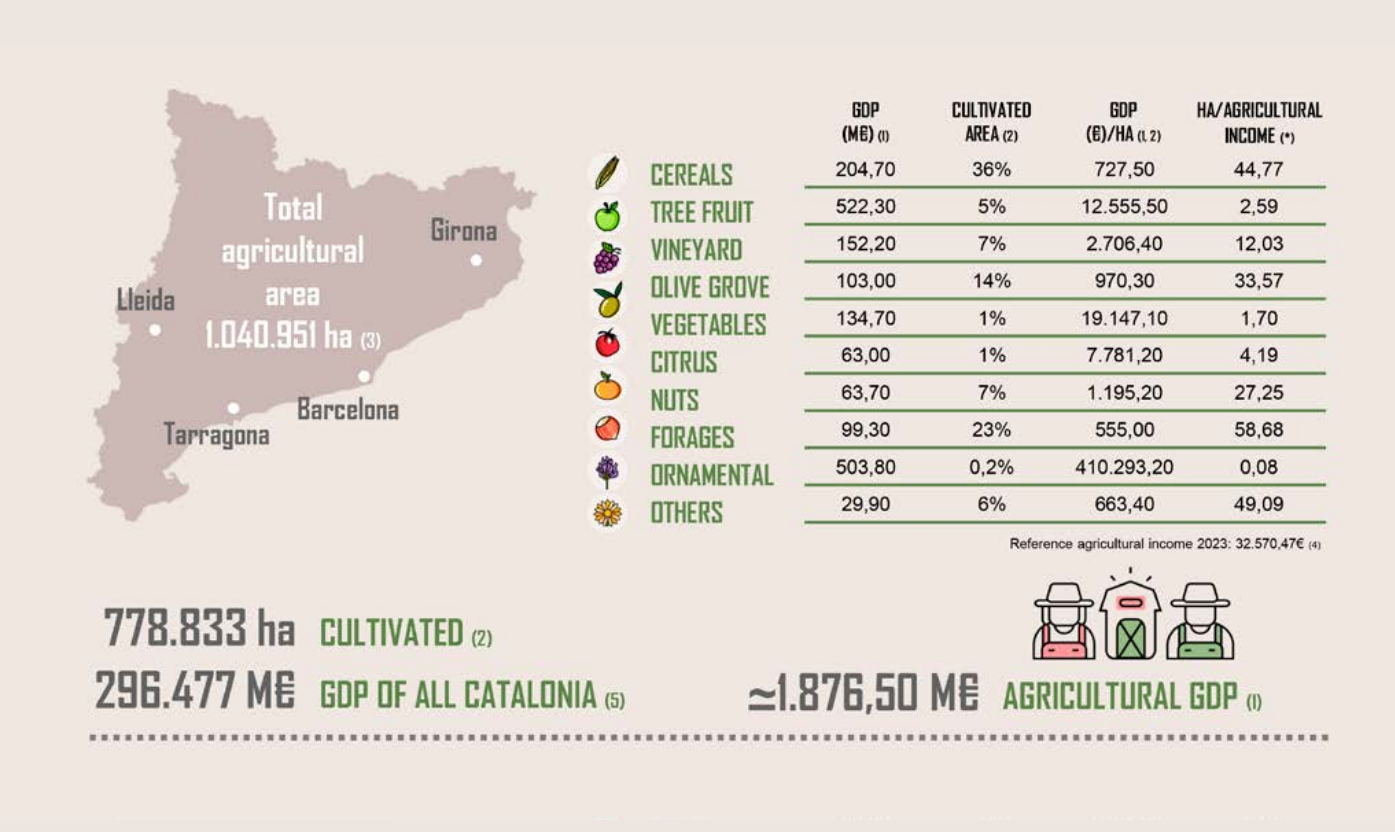
It is also worth highlighting some emerging models, such as regenerative agriculture, which seeks to restore the health of agricultural ecosystems through practices such as improving soil fertility, diversifying crops and reducing erosion, and agriculture aimed at increasing organic carbon in the soil, which contributes to the mitigation of climate change, practices that are already promoted through PAS.

This variety of models is a strength that must be used. It allows us to move towards an inclusive agroecological transition, where each system can add value and contribute to a more resilient, sustainable and rooted Catalan agriculture in the territory.

Officially certified systems offer added value and differentiation to products, and respond to a growing demand for quality, traceability and sustainability. However, the current challenge goes beyond the coexistence of models: it is necessary to promote an agroecological transition that involves all of agriculture and livestock breeding, not just a part of it. This transition must guarantee the economic viability of farms, environmental sustainability and territorial cohesion.

01.01 Economic weight

According to data from Idescat (Final Agricultural Production 2023, Department of Agriculture, Livestock, Fisheries and Food), the economic value of the agricultural sector is €1.877 billion and that of the livestock sector, €4.221 billion, in terms of final production (Fig. 2 and 3). The agricultural sector, therefore, contributes 30% of Catalan final agricultural production; the livestock sector, 68% and the production of services to agriculture and secondary activities, the remaining 2%. The agricultural sector is becoming a strategic sector for territorial management, food production and the pres-



GDP (M€) (1)	CULTIVATED AREA (2)	GDP (€)/HA (1, 2)	HA/AGRICULTURAL INCOME (*)
204,70	36%	727,50	44,77
522,30	5%	12.555,50	2,59
152,20	7%	2.706,40	12,03
103,00	14%	970,30	33,57
134,70	1%	19.147,10	1,70
63,00	1%	7.781,20	4,19
63,70	7%	1.195,20	27,25
99,30	23%	555,00	58,68
503,80	0,2%	410.293,20	0,08
29,90	6%	663,40	49,09

Reference agricultural income 2023: 32.570,47€ (4)

Figure 2. *Agricultural economic data from Catalonia. Sources: (1) Agricultural macromagnitudes Catalonia, 2023 (DARPA). (2) Idescat, 2023. (3) Idescat and DARPA. (4) Order APA/1300/2022, of 28 December, by which the reference income is fixed for the year 2023. (5) Prodeca.*

ervation of biodiversity, as well as the livestock sector which also constitutes one of the essential pillars of Catalan agri-food activity and is key in generating income, employment and territorial balance.

Regarding livestock farming, in 2024, Catalonia maintained its position as the main producing territory within Spain, with an approximate concentration of 40% of the total value of livestock production.

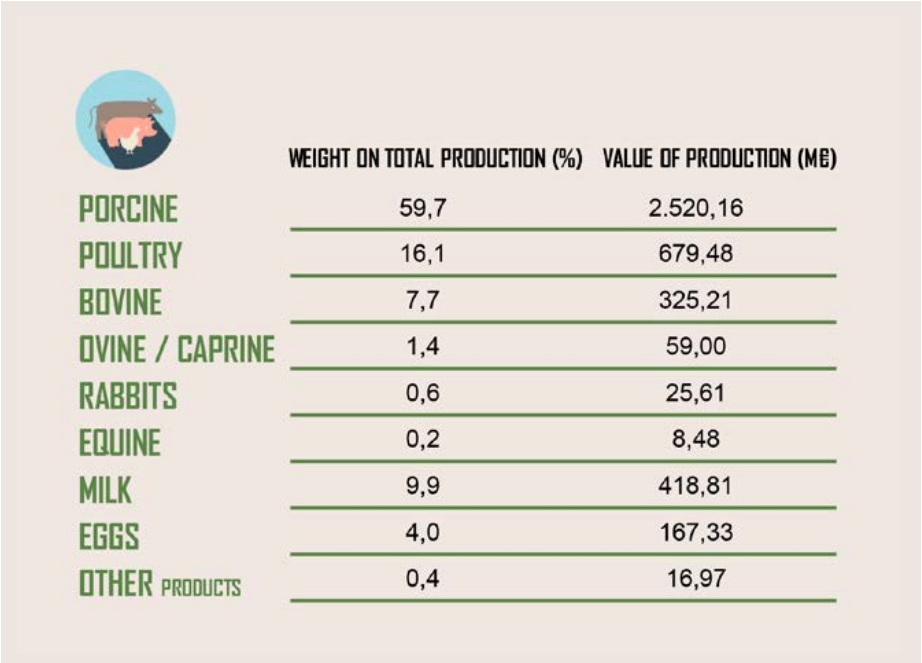
01.02 Diversity, specialisation and unequal returns of crops

The main crops in Catalonia present great diversity in terms of surface area, profitability and labour intensity. The most widespread crops are cereals, which occupy most of the cultivated territory (36%), but they are not the most profitable. On the other hand, sectors such as vegetables and ornamentals have a very small surface area (1% and 0.2%, respectively), stand out for their high profitability and labour intensity and generate a very high GDP per hectare (up to €410,293/ha in the case of ornamentals) (Fig. 2).

Sweet fruit, vines and citrus fruits combine an average profitability, while crops such as olive trees and nuts, more traditional and linked to rainfed agriculture, have a more modest profitability, but they provide value in terms of sustainability and territorial management. These data demonstrate the need to adapt agricultural policies to the specificities of each sector to guarantee its economic and social viability.

01.03 High specialisation and intensity in some livestock subsectors

The livestock sector has experienced an evolution marked by the volatility of international cereal and feed prices, the increase in energy costs and social and regulatory pressure in matters of biosecurity, animal health and welfare, manure management and environmental sustainability. Despite these factors, production has remained at high levels as a result of a highly specialised structure, the technical advancement of farms and the efficiency of production management.



	WEIGHT ON TOTAL PRODUCTION (%)	VALUE OF PRODUCTION (M€)
PORCINE	59,7	2.520,16
POULTRY	16,1	679,48
BOVINE	7,7	325,21
OVINE / CAPRINE	1,4	59,00
RABBITS	0,6	25,61
EQUINE	0,2	8,48
MILK	9,9	418,81
EGGS	4,0	167,33
OTHER PRODUCTS	0,4	16,97

Figure 3. *Economic data on the livestock sector in Catalonia. Source: Idescat. Final agricultural production (ESA-2010), 2023 (provisional).*

The pork sector is the largest in relation to final livestock production (59.7%). Also worth noting are poultry farming (16.1%), milk production (9.9%) and beef cattle (7.7%) (Fig. 3).

The predominance of the pork subsector demonstrates a high level of production specialisation, which favours competitiveness, but also generates vulnerability to changes in international markets. The Catalan pork production model is characterised by a high degree of concentration, with high technological performance farms and a high dependence on the price of cereals.

Poultry and cattle make up the second axis of the sector, with a growing orientation towards quality products and animal welfare certifications. Dairy production maintains a stable evolution, despite the challenges arising from industrial concentration and production costs.

The rest of the subsectors (sheep, goats, rabbits and other minor ones) maintain a smaller weight in terms of economic volume, but contribute significantly to the maintenance of the rural fabric, the diversification of food production, fire prevention, and the maintenance of rural biodiversity. In addition, they have a strategic territorial value; therefore they are essential from an agricultural public policy perspective.

02. Limitations and conditions for Catalan agriculture and livestock farming

Catalan agriculture develops in a context marked by multiple structural and environmental limitations that condition its competitiveness and growth capacity within the global agri-food sector.

02.01 Territorial and environmental factors

Figures 4 and 5 show the different limitations and conditions of the Catalan territory, which are aggravated by the effects of climate change.

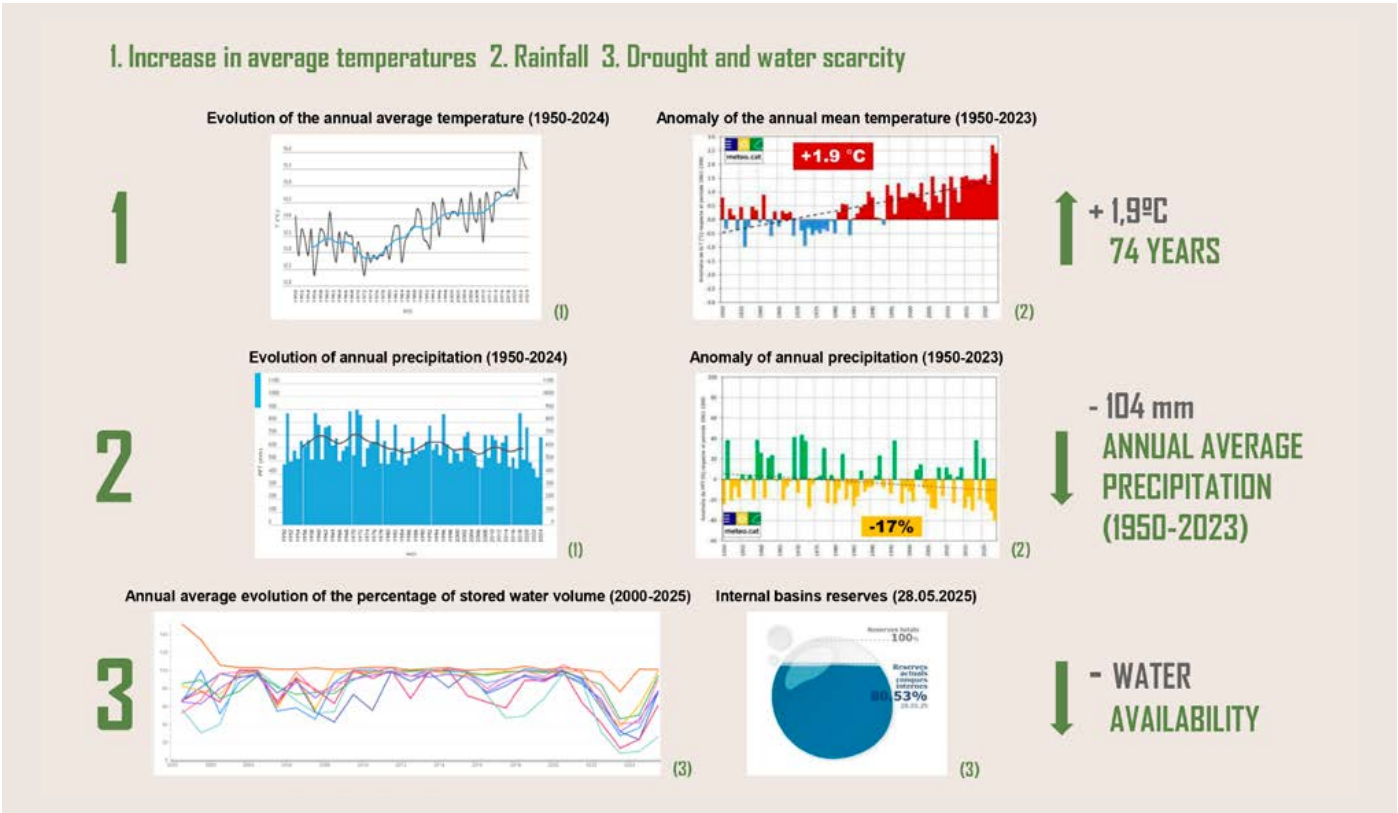


Figure 4. *Limitations and conditions for Catalan agriculture. Sources: (1) Annual Bulletin of Climate Indicators (BAIC) 2024. Full report. Meteorological Service of Catalonia. (2) Cunillera and Grañó, J. (Catalonia Meteorological Service). Evolution of the rainfall drought in the period 2021-2024 in the Montnegre-Corredor (PATT Conference 6 November 2024). (3) Catalan Water Agency.*

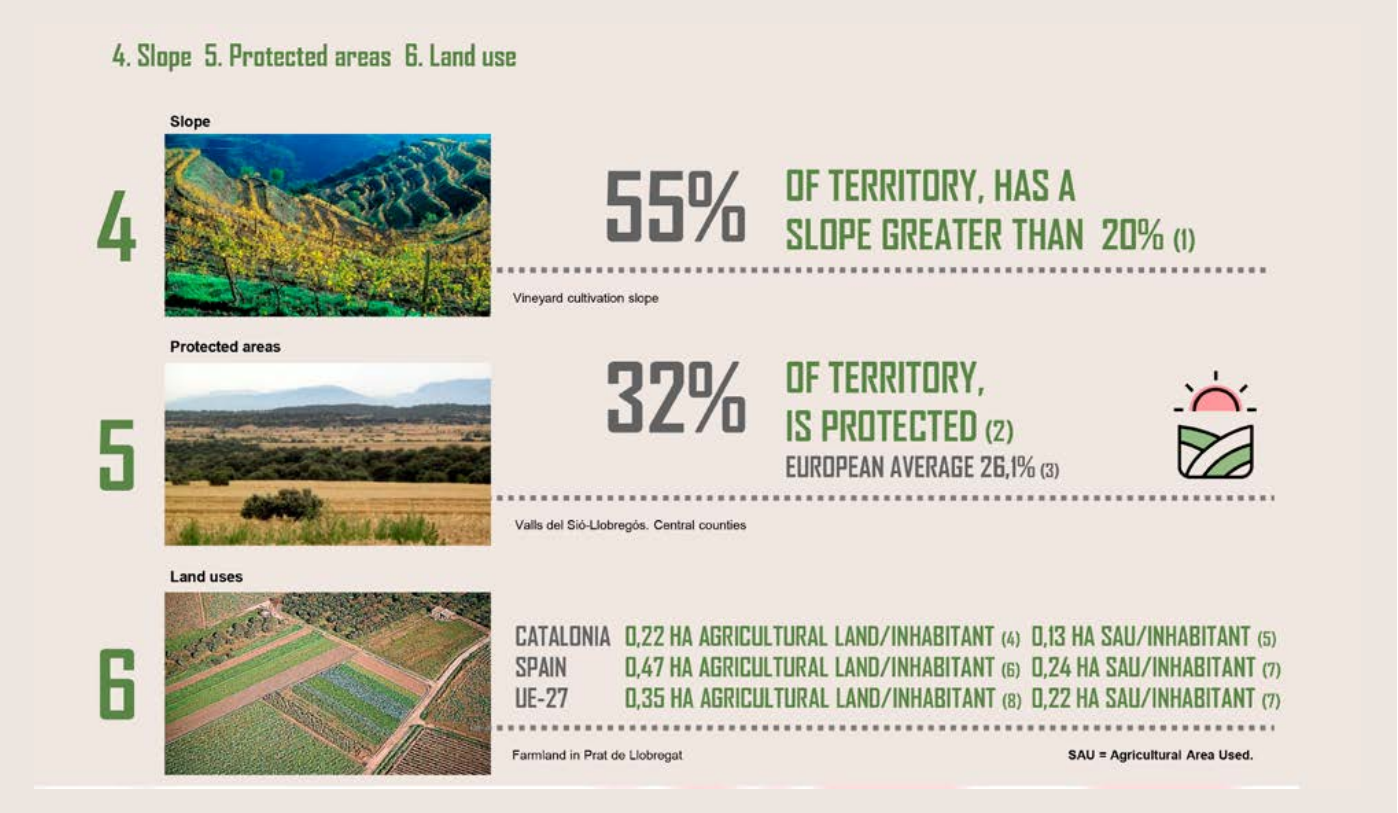


Figure 5. *Limitations and conditions for Catalan agriculture. Sources: (1) Prepared by DARPA with data from the National Centre for Geographic Information (2009-2012). (2) Idescat data 2022. Protected natural spaces. (3) Data from the European Environment Agency 2022. (4) Idescat data 2020 (5) Idescat 2023. Land uses. (6) MAPA, Esyrce, 2022. (7) World Bank Group data 2022. (8) Eurostat 2020. The number of inhabitants who participated in the calculation of these data are: CAT, 8M hab.; ESP, 49M inhabitants; EU-27, 450M hab.*

1 Temperature

- Increase in average temperature of 1.9°C from 1950 to 2023. This sustained increase in the average annual temperature can affect crop cycles and increase water stress in plants.

2 and 3 Reduction in precipitation/ water reserves

- Reduction in average annual precipitation by 104 mm, from 1950 to 2023.
- Decrease in average available water reserves reflecting the reduction in contributions and the increasing pressure on water resources, which shows the need for more efficient and sustainable water management in the agricultural sector.

This reduction in precipitation, combined with changes in land use and periods of drought and water scarcity, along with increasing pressure for other uses, limits water availability for irrigation and compromises the viability of certain crops.

4 Pending

- According to information from the National Centre for Geographic Information (2009-2012), Catalonia has a complex orography: 55% of the territory has slopes exceeding 20%, which hinders mechanised agricultural exploitation and limits the extent of arable land. This factor is especially relevant in crops such as vineyards, which are often found in areas with steep slopes, which increases production costs and limits cultivation alternatives.

5 Protected areas

- 32% of the Catalan surface area is classified as a protected area, according to data from Idescat at the Department of Agriculture, Livestock, Fisheries and Food (2022). This percentage is higher than the European average, which was 26.1% for the same year, according to data from the European Environment Agency. This means land use restrictions and limitations for new agricultural activities or transformations, especially in areas such as the Sió–Llobregós Valleys or the central districts.

6 Land uses

- Catalonia only has 0.22 hectares of agricultural land per inhabitant, well below the Spanish (0.47 ha/inhabitant) and European (0.35 ha/inhabitant) averages. If we look at the utilised agricultural area (UAA), the figure is even lower: 0.13 ha/inhabitant in Catalonia compared to 0.24 ha/inhabitant in Spain and 0.22 ha/inhabitant in the EU-27. These data reflect strong pressure on agricultural land and limited availability of land for agricultural activity.
- Another consideration that should not be underestimated in the case of livestock farms is the concept of distances between farms and other establishments or facilities that may represent a hygiene and health risk, which limits the use of soils with active potential.
- According to data from the Catalan Forest Observatory (2022), we have 1,576,800 hectares of private forest area and 497,600 hectares of public forest area. Added to all this is the fact that two-thirds of the Catalan territory is covered by forests, many of which are the result of the abandonment of agricultural land.

The combination of all these factors places Catalonia at a disadvantage compared to other competing countries within the global agri-food sector, but, despite the structural and environmental difficulties, Catalonia has been able to develop a powerful and competitive agri-food cluster, thanks to a strategy based on the following:

1. Use of irrigation to optimise agricultural productivity.
2. Livestock integration, with close collaboration between livestock farmers and the meat industry, which has contributed to maintaining the population in rural areas.
3. Technological development, with the IRTA as a reference centre in research and innovation, in collaboration with universities and companies.
4. It is committed to quality, increasingly recognised internationally.
5. Orientation towards the global market, with a clear export vocation.

03. The main current production models in Catalonia and future prospects

Currently, in Catalonia, various models of agricultural production coexist that respond to different realities, needs and strategies. They all play a role in shaping the sector and contribute to the country's food supply.

Conventional production:

This is the most widely implemented system and represents the majority of the cultivated area. It is based on widespread practices that use fertilisers and authorised phytosanitary products to ensure productivity and economic viability. Its flexibility and adaptability make it essential for the food supply. When applied with appropriate technical criteria, it can integrate measures that reduce environmental impact.

Certified productions:

These include regulated models that incorporate sustainability principles and have specific regulations:

Integrated Production (IP):

According to Article 3 of Law 2/2014, this is an agricultural system for producing and obtaining high-quality fresh or processed food that prioritises the use of natural resources and regulatory mechanisms. It aims to optimise production methods, avoid harmful contributions to the environment and ensure sustainable agriculture and livestock farming in the long term.

This system promotes integrated pest management by encouraging the use of alternative methods to chemical control. In addition, all operators must have a technical advisor.

Integrated Production is regulated at both the state and regional levels.

Culture	Surface area 2025 (ha)			%		
	IP	PAE	Conventional	IP	PAE	Conventional
Fresh fruits	19,065	1,482	18,978	48.24%	3.75%	48.02%
Dried fruits and nuts	9,138	4,323	33,906	19.29%	9.13%	71.58%
Olives	17,372	10,879	59,208	19.86%	12.44%	67.70%
Citrus	813	257	5,349	12.67%	4.00%	83.33%
Vegetables	797	743	3,892	14.67%	13.68%	71.65%
Vineyard	2,622	33,794	18,114	4.81%	61.97%	33.22%
Cereals	12,800	8,179	338,010	3.57%	2.28%	94.16%
Total	**62,607**	**59,657**	**477,457**	**10.44%**	**9.95%**	**79.61%**

Table 1. *Cultivated area in hectares and percentage of different production systems in Catalonia in 2025. Sources: Catalan Council for Integrated Production and DARPA's Agri-Food, Rural and Environmental Observatory.*

Organic agri-food production (PAE): This is defined in Article 180 of Law 2/2014 as a general system of agricultural management and food production that combines the best environmental practices, a high level of biodiversity, the preservation of natural resources, demanding standards on animal welfare and production in accordance with consumer preferences for products obtained from natural substances and processes.

This production system does not allow the use of synthetic chemicals or the use of genetically modified organisms.

PAE is regulated at both a European and regional level.

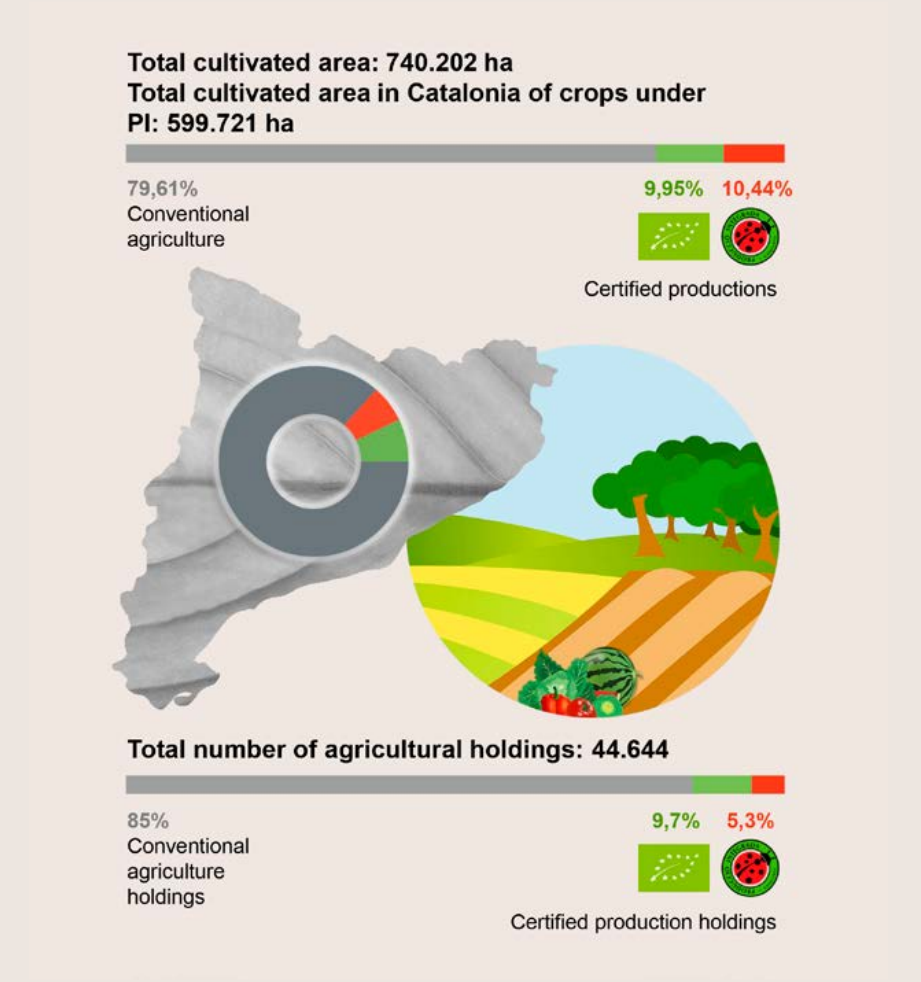


Figure 6. *Catalan farms according to production system. Sources: Catalan Council for Integrated Production and DARPA's 2025 Agri-Food, Rural and Environmental Observatory.*

03.01 The big figures of the productive models of agricultural production

Table 1 shows the surface area (in hectares) and the corresponding percentage of the main crops that are grown in Integrated Production, as well as its distribution between the different production systems: Integrated Production, organic agri-food production and conventional production.

In total, of the 44,644 farms that existed in Catalonia in 2025, 85% used conventional production (Fig. 6).

Both systems are certified, and this means that an entity external to the Administration travels to the farms that use IP and PAE to verify that the practices established in the rules that regulate these systems are complied with and, therefore, operators can label their products under the umbrella of IP or PAE. Nowadays, farmers who use IP or PAE do not necessarily have to do so on their entire farm, since the pro-

duction model is applied per crop line. By sector, sweet fruit, dried fruit and olives are the ones with the largest area of integrated production, while viticulture is the one with the largest area of organic agri-food production (Fig. 7).

03.02 The big figures of the production models of livestock farms

Regarding the livestock sector, 92.34% of farms do conventional livestock farming and only 7.66% do organic livestock farming. Integrated production does not have any technical livestock standards and, therefore, this system is not implemented in livestock farming.

Of all livestock farms, 70.95% are intensive; 15.88% are extensive, and 13.16% are semi-intensive (Fig. 7).

The livestock sector is under increasing pressure due to several factors:

- Urban pressure, which reduces the space available for livestock activity, especially in peri-urban areas.
- Management of livestock manure, a major environmental challenge that affects soil, water and air quality.
- Large-capacity farm projects that generate social rejection and question the sustainability of the intensive model.
- Increased social awareness of animal welfare which leads to greater demands on the production of animals for human consumption.

These tensions place great contradictions on the table: what are the limits to livestock growth? What model do we want for the future? And, above all, what are the viable solutions?

Extensive livestock farming is often presented as a more sustainable alternative, linked to the territory, with a lower environmental impact and a key role in landscape management and fire prevention. However, this model is not applicable everywhere or for everyone, and it would not respond to current demand, not even domestic demand: it requires specific conditions, institutional support and a revaluation of the final product.

In this context, it is necessary to open a deep and rigorous debate on the future of the livestock sector in Catalonia, which combines economic viability, environmental sustainability and social acceptance.

There are many challenges facing the livestock sector and, at this time of debate about the transition of production models, it is important to consider the basic pillars of these objectives:

- Strengthen digitalisation and technological innovation programmes on livestock farms.
- Promote biodiversity and environmental sustainability through emissions management strategies, resource reuse and circular economy.
- Promote the diversification of markets and commercial channels, with special attention to exports and local transformation.
- Improve technical training and knowledge transfer between the productive sector and research centres.
- Promote generational renewal policies and support for small farms in rural and mountain areas.
- Consolidate a Catalan quality brand in livestock products that integrates sustainability, animal welfare and traceability criteria.

The future of the Catalan livestock sector involves combining economic efficiency, sustainability and innovation, promoting traceability, digitalisation and differentiation of products.

03.03 Future prospects

The data shows that, for more than twenty years, various production models have coexisted in Catalonia that incorporate, to a greater or lesser extent, environmental criteria. Each model has provided value and has been key in the development of the sector, but now we need to take a step further.

Current certified systems are applied by crop line and do not address the operation in a comprehensive manner. Furthermore, none of them guarantees by itself the complete and cross-cutting integration of environmental, economic and social sustainability.

To move towards more sustainable agriculture, it is necessary to promote ac-

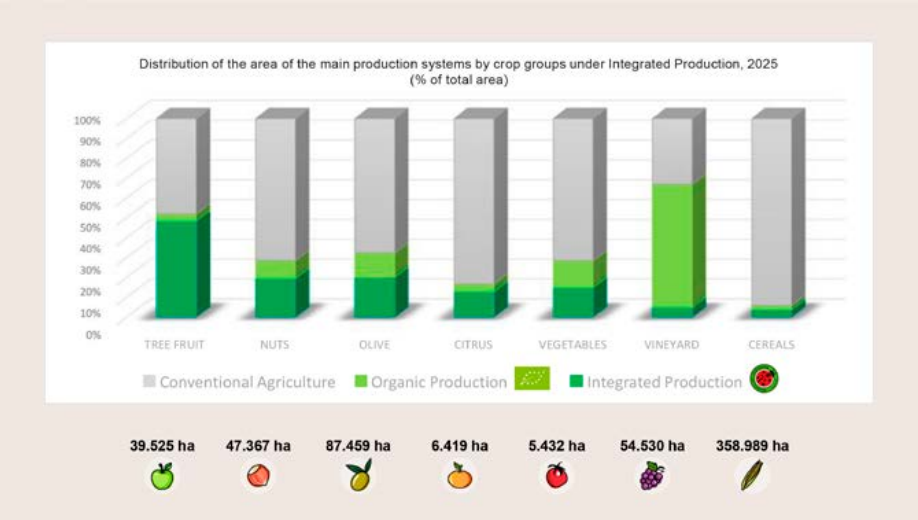


Figure 7. *Distribution of the surface area of the main production systems by crop groups, included in Integrated Production. Sources: Catalan Council for Integrated Production and DARPA's 2025 Agri-Food, Rural and Environmental Observatory.*

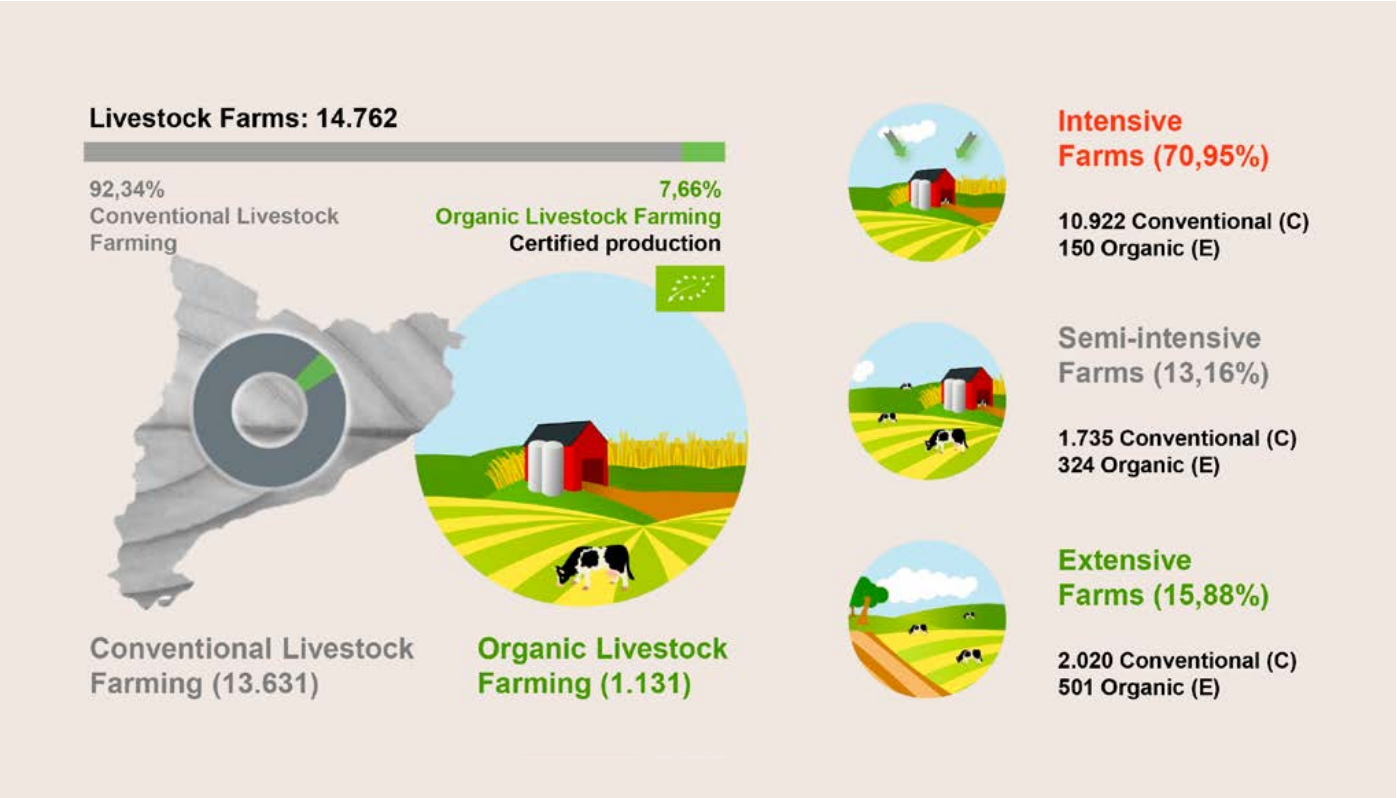


Figure 8. *Catalan livestock farms according to production system. Source: DARPA 2025 Agri-Food, Rural and Environmental Observatory.*

tions that facilitate this agroecological transition and strengthen awareness in both the agricultural sector and society about its key role in these areas:

- Food security and food production
- The conservation of natural resources
- The maintenance of agricultural activity and the settlement of the population in the territory

Currently, 85% of Catalan farms produce conventionally, while only 15% use certified systems such as organic agri-food production (PAE) and Integrated Production (IP). Although these models incorporate environmental criteria, they do not fully foresee the triple aspect of sustainability.

For this reason, it is necessary to take a step forward, that is, to evolve towards production systems that truly and in a balanced manner integrate environmental, economic and social aspects, that are aligned with European strategies and that guarantee the viability of the agricultural sector in the future.

Authors:

Rosa Mari Pedrol Esteve
Coordinator of Integrated Production. DARPA.
rmpedrol@gencat.cat

Carmen Trigueros Vilella
Technician from the Integrated Production Unit. DARPA.
carme.trigueros@gencat.cat

Roser March Solans
Administrative Clerk of the Integrated Production Unit. DARPA.
rosermarch@gencat.cat

David Romero Olivé
Technician from the Integrated Production Unit. DARPA.
davidromeroo@gencat.cat

Jordi Visa Cortada
Technician from the Integrated Production Unit. DARPA.
jordivisa@gencat.cat

Zaira Falero Guerrero
Technician from the Integrated Production Unit. DARPA.
zairafalero@gencat.cat

Alejandro Martinez Requena
Veterinary responsible for animal welfare at slaughter. DARPA.
alejandro.m.r@gencat.cat

Montse Alamos Lopez
Head of the Livestock Planning Service. DARPA.
malamos@gencat.cat

Anna Goutan Roura
Head of the Agricultural Planning Service. DARPA. General Sub-Directorate for Agriculture.
agoutan@gencat.cat

WHAT IS IT AND WHAT DOES IT BRING?
Sustainable Agricultural Production

A view to the future. Photo: Pixabay.

01. Introduction: a new look at the countryside

Catalan agriculture and livestock farming is at a decisive moment. The ageing of the farming community, economic pressure, the climate crisis and the growing disconnect between the rural world and urban society have put at risk not only the viability of the agricultural sector, but also food sovereignty and the sustainable management of the territory.

In this context, Sustainable Agricultural Production (PAS) emerges as a transformative response. It is not just a set of good agricultural practices, but a paradigm shift that places the farmer and livestock breeder at the centre, and a production system that ensures environmental sustainability, economic viability and social cohesion. PAS is not just a tool to improve the way we produce, but an opportunity to reconnect what has been separated: knowledge. scientific with practical knowledge, young generations with veterans, the rural world with the urban world. It is a proposal to forge alliances, to build an agricultural model that listens, learns and evolves. Because the countryside is not just a productive space: it is a space of life, culture and future projection.

> The Law on PAS is a regulation that aims to lay the foundations for a new agricultural model that is fairer, more efficient and aligned with the challenges of the 21st century.

PAS has been configured taking into account the productive needs of Catalonia and based on the experience accumulated in previous productive models.

Update the concept of agricultural sustainability and do it from the sector itself, with knowledge, rigour and roots in the territory. All of this has also led to the promotion of the Law on PAS, a regulation that aims to lay the foundations for a new agricultural model that is fairer, more efficient and better aligned with the challenges of the 21st century.

This Law aims to ensure a positive or neutral environmental impact of the entire food chain, ensuring the protection of natural resources, food safety, nu-

trition and public health. It also wants to preserve the affordability of food in order to guarantee access to it for the entire population.

To make this possible, the Law provides for:

- Define what we understand by sustainability from the Catalan productive reality, with technical, realistic criteria adapted to our environment.
- Establish a public, objective and transparent system for evaluating the sustainability of farms.
- Offer digital tools and technical support to accompany farms in their continuous improvement.
- Promote voluntary certification that allows the most sustainable productions to be highlighted and connected with the consumer and the entire value chain.
- Recognising the sector's efforts, with incentives and visibility mechanisms, to improve the social perception of farming and promote responsible consumption.
- Accompany the transition towards agroecology, with training, advice and technical support.
- Contribute to the economic viability of farms, so that they can continue to develop their activity with guarantees for the future.
- Improve the quality of life of people who work in the countryside, dignifying their work and promoting generational renewal.
- Promote collaboration between research centres, universities, technical services and farming, to move forward together.
- Create co-governance spaces, with representation from the sector, the Administration, the scientific world and civil society.
- Establish a periodic monitoring and review system to adapt to the technological, climatic and social changes that are already here.

If the initiative is not taken from here, it will be done from outside. And too often, this entails impositions that are divorced from the reality, with rules that can often be absurd or unattainable. We need to act with determination, lead our own future and defend what is ours. Being proactive is not just an option: it is a necessity.

Principles that guide PAS. Source: DARPA.

The Law on PAS applies to all farms in Catalonia, whether large or small, conventional, integrated or organic. Each farm can improve from its own starting point, with the resources and conditions it has. It is not about being perfect, but about making progress. And on this path, any small step is praiseworthy. Because sustainability is not a fixed goal, but a living, shared and progressive process.

02. What is Sustainable Agricultural Production (PAS)?

It is a voluntary production model that aims to evaluate, recognise and value Catalan farms according to their level of sustainability, understood from an environmental, economic and social perspective.

PAS establishes an objective and measurable system that allows each farm to know its degree of sustainability, identify areas for improvement and progress at its own pace, with the support of digital tools and technical advice. It is a process of continuous improvement, adapted to the diversity of the sector, which does not seek perfection, but rather commitment and progress.

This model represents a series of opportunities for the agricultural sector: to draw attention to the effort that many farms are already making, to strengthen their viability, to gain social recognition and to open up new market opportunities through voluntary public certification.

PAS not only measures, but also connects people, knowledge, generations and territories. It is a tool to build a fairer and more resilient agricultural model better aligned with the challenges of the 21st century.

How is PAS implemented on farms?

It is planned as a voluntary, flexible process adapted to the reality of each farm. The objective is to facilitate a realistic and effective transition towards a more sustainable model, without impositions, but with tools and support to make it possible. The process takes place in several phases:

- Self-assessment and digital tools

Any farm can calculate its level of sustainability using digital tools offered by the PAS system. These tools allow for an objective and accessible self-assessment. Farms with higher levels of sustainability can opt, always on a voluntary basis, for public certification that recognises their commitment.

- Initial assessment

A diagnosis is made of the current situation of the operation in terms of environmental, economic and social sustainability. This diagnosis serves as a starting point for defining improvement objectives.

- Application of indicators and criteria

A public and transparent protocol with measurable indicators is used to assess the degree of sustainability. These indicators may include aspects such as efficient water use, waste management, biodiversity, animal welfare, etc.

- Technical support

Farms receive technical and training support to implement improvements and adapt to sustainability criteria. The exchange of knowledge and good practices between professionals in the sector is encouraged.

PAS not only promotes sustainable agricultural practices, but also wants to promote positive and shared change throughout the sector.

PAS gives the countryside a voice in public decisions.

- Product certification and valorisation

Farms that pass the certification process can differentiate their products and highlight the fact that they come from a farm that produces sustainably. This certification is voluntary and represents the reward and recognition for a job well done. It is also the way to show this differentiation to consumers and society. In addition, it is compatible with other public certification, such as that for organic farming, and work will be done to find synergies that facilitate the management and recognition of good practices.

This implementation model aims to be a useful and transformative tool, which recognises work well done and helps move towards a more resilient, competitive and committed agricultural sector with the territory. PAS not only promotes sustainable agricultural practices, but also wants to promote positive and shared change throughout the sector.

Steps to implement PAS. Source: DARPA, with background images from Pixabay.

PAS as a cohesion tool. Source: DARPA, with background images from Pixabay.

03. PAS as a driver of social and territorial change

PAS not only transforms the way we farm, but also the way we understand the role of agriculture within society. At a time when the rural world is often disconnected from the urban world, PAS can act as a bridge between territories, generations and sectors.

PAS wants to go beyond environmental improvement of farms. Its true potential lies in its ability to transform the territory and rural society, through several pillars:

- Recognition and dignity of the agricultural sector

PAS values the work of farmers and livestock breeder, making visible their commitment to the environment and food quality. This visibility helps to dignify the profession and reinforce its role as managers of the territory.

- Boost to the rural economy

With voluntary certification, farms can differentiate their products and access new marketing channels, improving their profitability. This contributes to slowing down depopulation and keeping the local economic fabric alive.

- Territorial cohesion and generational renewal

A more sustainable and recognised agricultural sector can attract new farmers, especially young people and women, and can help maintain activity in rural areas. This strengthens territorial cohesion and avoids the concentration of population in urban areas.

- Participation and co-responsibility

The fact that any farm can calculate its level of sustainability and access digital tools encourages the active involvement of the sector. PAS does not

impose itself, but rather invites participation, improvement and sharing of good practices.

- Construction of a positive and shared story

PAS helps build a story that breaks with clichés and shows that Catalan farming is modern, responsible and committed. This story is key to regaining society's trust and strengthening the link between the rural and urban worlds.

04. Conservation of natural resources: tangible environmental benefits

One of the fundamental pillars of Sustainable Agricultural Production (PAS) is the preservation of natural resources, which are the basis of any agricultural activity. Without fertile soils, clean water and balanced ecosystems, there is no future for agriculture. PAS proposes a model that takes care of the environment while ensuring food production, generating concrete and measurable environmental benefits.

Soil conservation

- Prevents erosion through practices such as crop rotation, plant covers and reducing intensive soil work.
- Improves fertility through the use of composting and organic fertilisers, and the reduction of chemical fertilisers.
- Increases the capacity to retain water and nutrients, making crops more resistant to droughts and extreme conditions.

Sustainable water management

- Efficient irrigation with drip systems and humidity sensors that optimise water use.
- Reduction of aquifer pollution through better management of fertilisers and slurry.
- Reduction in water consumption through the implementation of saving agricultural techniques.

Biodiversity protection

- Diversification of crops that favours the presence of pollinating insects and auxiliary fauna.
- Wildlife refuge areas such as flower banks, hedgerows or natural ponds.
- Reduction of monocultures, which often impoverish the soil and promote pests.

Pollution reduction

- Less use of phytosanitary products and chemical fertilisers, with practices such as biological control or precision fertilisation.
- Reduction of atmospheric pollutants (such as greenhouse gases and/or pollution gases), thanks to more efficient management of energy and raw materials.

With PAS, each farm explains its own reality.

PAS not only measures, but also guides, accompanies and improves.

Climate change mitigation

- Carbon capture through plant covers, crop rotation and agroforestry practices.
- Use of renewable energy sources and reduction of dependence on fossil fuels.
- Improvement of the agricultural landscape
- More resilient and multifunctional landscapes, which combine production, conservation and aesthetic value.
- Potential for rural tourism and environmental education, strengthening the link between territory and society.

The agricultural sector, in addition to living off the territory, takes care of it because it directly depends on it. Without a healthy environment, there is no future for agriculture or livestock. For this reason, farmers and livestock breeders are the first to be interested in preserving natural resources, since they are the basis of their lives and jobs.

Impact of PAS on the sector, research and agricultural policy. Photo: DARPA with background Pixabay images.

05. Direct impact on the agricultural sector

PAS not only provides environmental benefits, but also offers concrete answers to the internal challenges of the agricultural sector. In a context of profitability crisis, climate uncertainty and disconnection with the consumer, PAS is presented as a tool to revitalise agricultural activity from within, with realistic and sustainable solutions.

Recovery of profitability

- Cost reduction thanks to more efficient management of resources, such as water, fertilisers and energy.
- Utilisation of waste for composting or bioenergy, converting expenses into resources.
- Access to markets with added value, such as organic, local or sustainably certified products.
- Diversification of productions, which allows risks to be reduced and better adapted to market demands.

Environmental resilience

- Healthier and more fertile soils, which improve productivity and reduce dependence on external products.
- Better adaptation to climate change, thanks to practices that increase water retention capacity and resistance to extreme events.
- Reduction of environmental pollution, which improves the quality of life for both farmers and nearby communities.

Social and territorial sustainability

- More rural employment, thanks to more knowledge-intensive and management-intensive production models.
- Revitalisation of the territory, with more active, visible and connected farms with society.
- It curbs rural depopulation, offering real opportunities for life and work in the countryside.
- Better quality of life for farmers, with more stable, recognised and sustainable farms.
-

Response to consumer demand

- Consumers increasingly value sustainable, healthy and quality food.
- PAS allows us to regain confidence in agricultural products, with greater transparency, traceability and environmental commitment.
- This connection with the consumer can strengthen the image of the sector and open up new commercial opportunities.

PAS offers an opportunity to reconnect scientific knowledge with agricultural practice, generating useful, applicable and replicable solutions and a solid basis for making more efficient, realistic and fair policies.

PAS is not just a commitment to the future, but a practical tool to improve the present of the agricultural sector. It is a way to make the sector stronger, fairer and more prepared for the challenges ahead.

06. Impact on research and innovation: connection with the countryside

PAS not only transforms farms and policies, but can also guide research and innovation towards the real needs of the agricultural sector. Too often, agricultural research is carried out somewhat disconnected from the day-to-day lives of farmers. PAS offers an opportunity to reconnect scientific knowledge with agricultural practice, in order to generate useful, applicable and replicable solutions.

Identification of specific problems

- PAS provides real data on the difficulties of implementing sustainable practices, whether technical or economic.
- It allows specific problems to be detected by sector, territory or type of exploitation, which can guide more precise and effective lines of research.

Orientation of applied research

With this information, practical solutions can be developed to:

- Improve plant cover.
- Reduce the use of chemicals without compromising harvests.
- Adapt crops to new climatic conditions.
- Optimise the use of water and other resources.

Participatory and applied research

- PAS facilitates a direct connection between researchers and farmers, and creates collaborative spaces where solutions are validated in real field conditions.
- This participatory research generates trust, agility and more relevant results for the sector.

Monitoring the impact of innovation

- PAS allows the impact of innovations to be evaluated before and after implementation, and promotes continuous improvement.
- The good practices identified can be disseminated and replicated, in order to multiply the benefits.

PAS can become the common thread between knowledge and action to ensure that agricultural innovation is not only advanced, but also useful, accessible and transformative. It is an opportunity to make research look at the countryside again, and for the countryside to feel listened to, valued and supported.

07. Impact on public policies

Sustainable Agricultural Production (PAS) not only transforms farms, but can also profoundly improve the way public policies are designed and implemented. In a context of limited resources and diverse needs, PAS offers a solid basis for making more efficient, realistic and fair policies.

Real knowledge of the sector

- PAS generates detailed environmental, economic and social data for each farm.
- This knowledge allows us to make a diagnosis tailored to the reality of the territory and identify the specific needs of each area and type of production.

Data-driven prioritisation

- With reliable information, administrations can identify priority sectors and areas for intervention.
- This allows for the personalisation of aid and policies in order to adapt them to real conditions and avoid generic approaches that often do not work.

Continuous evaluation and improvement

- PAS facilitates monitoring of the effectiveness of the aid and the measures applied.
- This allows regulations and strategies to be adjusted based on the results obtained and foster a culture of continuous improvement and institutional learning.

Transparent dialogue between administration and farmers

- Sharing data and diagnoses creates trust and consensus among the actors involved.
- PAS can be a tool to better substantiate regulatory measures and make them more understandable, accepted and effective.

Ultimately, PAS can act as a bridge between the reality of the countryside and political decisions, in order to ensure that agricultural policies are not only well-intentioned, but also well-informed and effective.

08. Conclusion: a path towards the agriculture of the future

Sustainable Agricultural Production (SAP) is not just a technical tool or a management strategy. It is a vision of the future for Catalan agriculture, which understands that sustainability is not an option, but a necessity. A vision that recognises that respect for the environment, economic viability and social cohesion are not contradictory objectives, but complementary and inseparable.

PAS shows us that it is possible to produce quality food, take care of the territory and guarantee a dignified life for farmers and livestock breeders. It invites us to reconnect society with farming, to protect natural resources, to strengthen the agricultural sector, to make public policies more efficient and to align research with the real needs of the countryside.

It is a tool to recognise the efforts of farms, to support them in continuous improvement, and to build a fairer, more resilient and connected food system with the reality of the 21st century. It is also an opportunity to lead change from a local reality, with our own criteria, proven and rooted in the territory.

This article wanted to open a window into this new way of doing agriculture. An agriculture that not only looks at the present, but also sows the future. Now is the time to join forces: farmers, livestock breeders, technicians, researchers, food companies, the Administration and the public. Because the future of the countryside is the future of everyone.

PAS is, in short, a countrywide proposal. And every step we take in this direction, no matter how small, brings us closer to a more vibrant, more dignified and more sustainable agricultural model.

Authors

Rosa Altisent Rosell
General Directorate for Agriculture and Livestock DARPA.
rosaaltisent@gencat.cat

Neus Ferrete Gracia
Deputy Director-General of Agriculture. DARPA.
neus.ferrete@gencat.cat

Mercè Soler Barrasus
Deputy Director General of Livestock. DARPA.
merce.soler@gencat.cat

Montserrat Alamos Lopez
Head of the Livestock Planning Service. DARPA.
malamos@gencat.cat

Anna Goutan Roura
Head of the Agricultural Planning Service. DARPA.
agoutan@gencat.cat

Rosa Mari Pedrol Esteve
Integrated Production Coordinator. DARPA.
rmpedrol@gencat.cat

SOWING SUSTAINABILITY: practices that promote Sustainable Agricultural Production

01. Introduction

On the farms of Catalonia, every decision counts. How they are irrigated, how the soil is protected, how the animals are cared for, how resources are used or how the human team is treated. Sustainability translates into specific actions that make a farm more efficient, more resilient, fairer... and, above all, better prepared for present and future challenges.

Sustainable Agricultural Production (PAS) recognises and promotes a whole series of sustainable practices, based on technical knowledge and current scientific evidence, with the support of researchers from the Institute of Agro-Food Research and Technology (IRTA), sector technicians and Administration technicians.

Food must be produced while respecting the environment and ensuring economic and social sustainability.

And, with this maxim, these are the main practices that have been defined in the PAS project and that will continue to evolve over time, as new knowledge becomes available that allows them to be improved and updated.

02. Environmental sustainability: taking care of the resources that allow us to produce

The PAS environmental bloc represents a firm commitment to caring for the environment and the responsible management of natural resources. This bloc promotes practices ranging from calculating the carbon and water footprint to planned and sustainable fertilisation, reducing the impact on air, water and soil. It also promotes the efficient use of water with advanced irrigation techniques, the improvement of soil quality through plant covers, rotations and organic residues, and the conservation of biodiversity with ecological infrastructure and the protection of species. In the field of phytosanitary products and fertilisers, the focus is on technical advice, integrated management, application registration and the use of decision-making tools to minimise environmental risks. In addition, the production of renewable energy is encouraged for use on farms, energy efficiency and responsible waste management.

Drip irrigation. Photo: DARPA.

Vegetable cover in a fruit field. Photo: Pixabay.

Agricultural practices of the environmental bloc			
Theme	**Sub-theme**	**Practice**	**Practice regenerative**
Atmosphere	Greenhouse gases	Calculate the carbon footprint	
	Air quality	Manage fertilisation with livestock manure while protecting the air quality	
Water	Water use	Map the available water resources, describe the farm's irrigation system and measure and record irrigation water consumption.	
		Use efficient irrigation systems	
		Use water-saving techniques	
		Use rational irrigation programming tools	
		Calculate the water footprint	
	Water quality	Manage fertilisation with nitrogen fertilisers while protecting the water quality	
		Prevent and control contamination by phytosanitary products	
Soil	Soil quality	Incorporate crop residues into the soil	X
		Maintain a living vegetation cover	X
		Use soil tillage techniques that respect the soil's edaphic structure.	
		Prioritise techniques to avoid soil compaction	X
		Carry out crop rotation	
		Implement alternative techniques for the improvement of soil fertility	
	Soil degradation	Prevent and minimise soil erosion	X
		Prevent and control phytosanitary contamination	
Biodiversity	Ecosystem diversity	Conserve, maintain or install ecological infrastructure	X
		Protect and conserve wild birds and bats	X
	Species diversity	Conserve and promote cultivated biodiversity	X
	Genetic diversity	Conserve and promote cultivated genetic biodiversity	
Materials and energy	Use of materials fertilisers	Have technical advice on fertilisation matters	
		Store fertilisers safely	
		Plan fertilisation with agronomic criteria	
		Use decision-making tools in fertilisation	
		Develop a fertilisation plan	
		Record fertiliser applications	
		Prioritise organic fertilisation	X
		Carry out a nitrogen assessment of the farm	
		Carry out a phosphorus assessment of the farm	

Theme	Sub-theme	Practice	Practice regenerative
Materials and energy	Use of materials phytosanitary products	Provide technical advice on integrated pest and disease management	X
		Monitor pests and diseases and use tools to support decision-making	
		Use alternative techniques to phytosanitary products for pest and disease control	
		Use alternative techniques to chemical herbicides in weed control	
		Maintain the phytosanitary warehouse in suitable conditions	
		Maintain (adjust, calibrate and inspect) phytosanitary treatment equipment	
		Minimise drift from phytosanitary treatments	
		Prevent and control phytosanitary contamination	
		Use proven dose calculation systems and volume of phytosanitary application	
		Register phytosanitary applications	
		Train phytosanitary product applicators	
		Use phytosanitary products according to current legislation	
		Measure the impact of phytosanitary product application	
	Energy	Monitor energy consumption	
		Implement energy saving measures	
		Produce renewable energy for own consumption by the farm	
	Reduction and elimination of waste	Manage waste	
		Use recycled or biodegradable material	
		Reduce food loss and waste	

Practices of the agricultural environmental bloc of PAS, organised by theme and sub-theme. Source: DARPA.

03. Environmental bloc practices

What do they specifically contribute to farm owners?

Saving resources and reducing costs

The efficient use of water, energy and fertilisers allows for the optimisation of inputs and the reduction of production costs without losing performance.

Improving soil fertility and health

Practices such as crop rotation, the incorporation of plant residues or plant covers contribute to maintaining living and productive soil in the long term.

Reduction of environmental and legal risks

The correct management of phytosanitary products, fertilisers and waste minimises the environmental impact and helps to comply with current regulations, thus avoiding sanctions and conflicts.

Adaptation to the effects of climate change

With better management of natural resources, farms are more resilient to droughts, pests or increasingly frequent extreme phenomena.

What do they contribute to society?

Protection of common natural resources

Responsible management of soil, water and air contributes to preserving the environment for future generations.

More food security and quality

Controlling the use of phytosanitary products and fertilisers reduces pollution and guarantees safer food for the consumer.

Conservation of biodiversity and the agricultural landscape

Ecological infrastructure, habitat management and crop diversity help maintain living and balanced ecosystems.

Reduction of the impact of climate change and the water footprint

Calculation and reduction of the carbon and water footprint contributes to mitigating greenhouse gas emissions and reducing water scarcity.

Livestock practices of the environmental bloc		
Theme	**Sub-theme**	**Practice**
Atmosphere	Greenhouse gases	Calculate the carbon footprint Calculate enteric emissions of methane in ruminants Implement regular control and evaluation procedures and programmes related to environmental measures to reduce greenhouse gas emissions according to housing and waste management facilities. Establish good environmental practices to reduce greenhouse gas emissions according to housing and waste management facilities
	Air quality	Implement regular monitoring and evaluation procedures and programs related to environmental measures to verify or control air quality Establish good environmental practices to reduce emissions of particles, dust and odours
Water	Water use	Monitor farm water consumption Implement water-saving measures Calculate the water footprint
	Water quality	Supply water in sufficient quantity and of good quality Implement measures to reduce the impact of livestock activity to protect water quality
Soil	Soil quality	Managing natural soil resources, habitat conservation and the landscape through grazing Manage the storage of livestock manure to avoid emissions into the soil
	Soil degradation	Manage grazing by reducing soil degradation and erosion
Biodiversity	Diversity of the ecosystem, habitats and productions	Conserve, maintain or install infrastructure or practices to promote and protect ecosystem diversity
	Genetic diversity	Conserve and promote the diversity of lines and breeds raised on the farm
Materials and energy	Use of resources	Calculate phosphorus efficiency at farm level Calculate nitrogen efficiency at farm level Implement feeding and nutrient use strategies to reduce emissions Implement practices that promote food consumption by livestock which is more sustainable from a production point of view
	Energy	Monitor the farm's energy efficiency Implement energy saving measures (efficiency or production of renewable energy for self-consumption)

Theme	Sub-theme	Practice
Materials and energy	Reduction and elimination of waste	Manage waste generated in livestock activity Use recycled or biodegradable materials
Animal health and welfare	Animal health	Implement programmes and measures to reduce the use of antimicrobials Implement measures to minimise health risks on farms
	Animal welfare	Develop training programmes in animal health and welfare Implement regular control and evaluation procedures and programmes related to animal health and welfare. Apply measures to control and reduce stress

Practices in the livestock environmental bloc of PAS, organised by theme and sub-theme. Source: DARPA.

Opting for cleaner technologies and efficient systems that reduce emissions allows us to have a healthier environment.

Every drop counts: good water management ensures its current and future availability.

Consolidation of a sustainable agricultural model

These practices make possible an agricultural system that is committed to society, modern and compatible with the environmental values that citizens increasingly demand.

04. Social sustainability: taking care of farmers and livestock breeders

The social bloc of Sustainable Agricultural Production emphasises the human value of farms, promoting practices that improve working conditions and personal well-being. These include actions such as guaranteeing decent pay, facilitating quality free time and promoting continuous training in the workplace. We also work to ensure compliance with contracts, freedom of association, the absence of underage workers and equal opportunities, avoiding any form of discrimination.

In addition, the hiring of vulnerable people is encouraged and job security is prioritised, both in training and physical working conditions, as well as access to healthcare coverage. This set of practices not only contributes to a better quality of life for staff, but also reinforces the sector's commitment to Sustainable Agricultural Production, which is socially responsible and aligned with the current demands of citizens and markets.

05. Social bloc practices

What do sustainable social practices bring to farm owners?

Improving the work climate and making staff want to stay in the agricultural sector

Trained, well-treated and valued workers tend to be more motivated and committed, and to stay on the farm longer.

Improvement of image and market positioning

Consumers, distributors and institutions increasingly value products from socially responsible farms that care for their workers.

Efficiency and occupational safety

Having adequate training in occupational safety and having safe conditions improves productivity and reduces accidents, with less need for sick leave.

What do they contribute to society?

They guarantee decent and fair working conditions

Consumers can be sure that behind the products they are buying there are decent working conditions.

Inclusion and social cohesion in the rural world

Promoting equality and hiring vulnerable people and avoiding discrimination contribute to a more inclusive and socially sustainable rural environment.

Increase in generational renewal in the agricultural sector

A socially robust structure within farms ensures the continuity of the agricultural model and promotes generational renewal.

Improved image for the agricultural sector

The sector positions itself as a driver of economic and social development and dignifies the agricultural profession in the eyes of society.

Agricultural and livestock practices of the social bloc		
Theme	**Sub-theme**	**Practice**
Decent living conditions	Quality of life	Ensure that the employer and staff have quality free time
	Salary level	Remunerate the staff in a dignified manner
	Capacity development	Ensure staff training in their work area
Labour rights	Labour relations	Meet all the obligations derived from of the employment contract
	Child labour	Ensure there are no underage workers
	Freedom of association and right to collective bargaining	Guarantee freedom of association for employees
Equality	Non-discrimination	Not discriminate against any worker at the farm
	Gender equality	Promote gender equality
	Support for vulnerable people	Encourage the hiring of vulnerable personnel
Occupational health and safety	Health training and monitoring	Guarantee training in occupational health and safety
	Workplace, operations and facility safety	Ensure safety in the workplace, operations and facilities
	Health coverage and access to medical care	Guarantee health coverage and access to medical care
Food sovereignty	Control over their own production and supply system	Food sovereignty

Internships from the PAS agricultural and livestock social bloc, organised by theme and sub-theme. Source: DARPA.

Child labour, Photo: Background image from Pixabay.

06. Economic sustainability: profitability for the countryside, without mortgaging its future

The PAS economic bloc aims to strengthen the viability of farms from a practical approach oriented towards efficient management. The calculation of income and production costs is promoted as a key tool for improving economic profitability and decision-making. The diversification of income sources is also promoted to reduce vulnerability and promote production stability. In the field of food quality and safety, practices include hygiene control measures, the exclusion of dangerous phytosanitary products, self-monitoring of waste and tracking of the maximum limits exhaustion index. In addition, production under certified quality schemes and the digitalisation of information are encouraged, through the registration of actions and complete traceability by plot.

This set of practices not only contributes to more efficient management, but also prepares farms to compete in demanding markets, reinforcing consumer confidence and the value of the agricultural product.

07. Economic bloc practices

What do they contribute to farm owners?

Improving the profitability of farms and being aware of their economic situation

Calculating income and costs allows you to accurately know the economic situation of the farm and make informed decisions to improve its results.

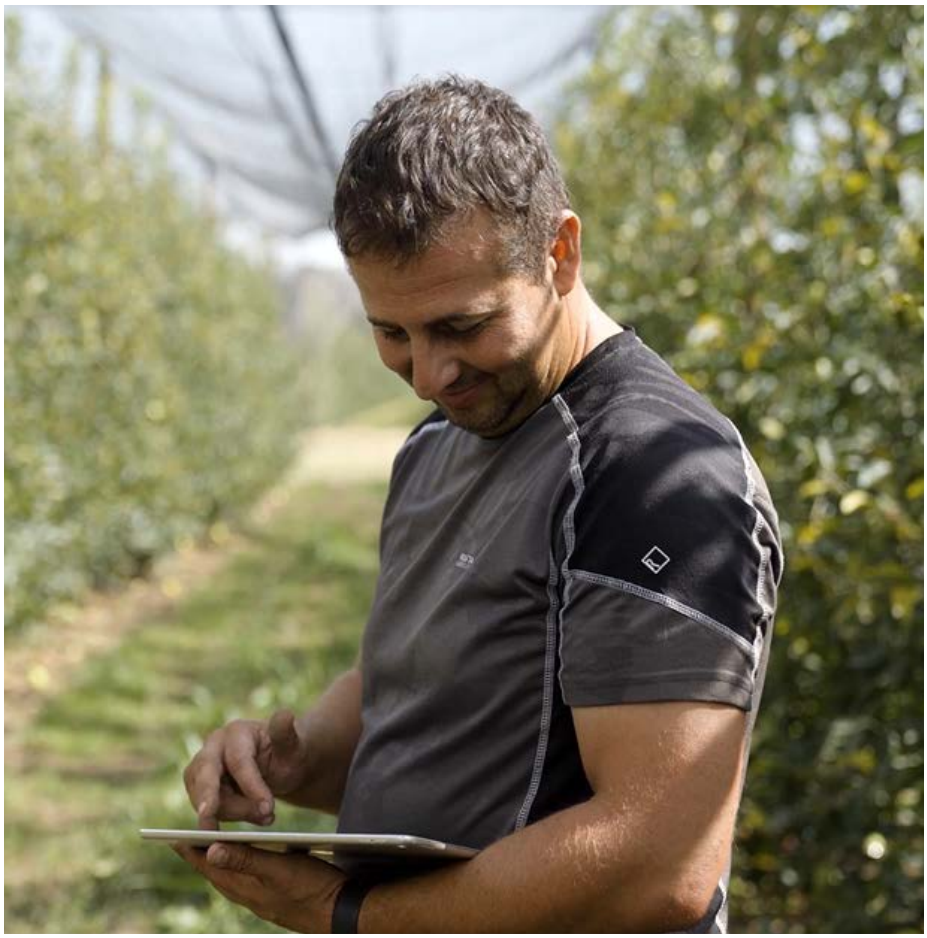
Risk reduction and more stability

Income diversification and production monitoring provide resilience in the face of market fluctuations or adverse conditions.

Access to more demanding markets

Traceability, waste control and working under certified quality schemes

If farms are sustainable, generational renewal is promoted.



Record of performances in a digital notebook. Photo: DARPA.

Agricultural and livestock practices in the economic bloc		
Theme	**Sub-theme**	**Practice**
Investment	Economic profitability	Calculate the net income of the farm Calculate the production costs
Vulnerability	Production stability	Diversification of income sources
Quality of the product and information	Product safety and hygiene	Establish control measures to guarantee production hygiene and food security Exclude the use of phytosanitary products classified as dangerous or toxic Carry out a self-check of phytosanitary residue Calculate the exhaustion rate of the maximum waste limit
	Product quality	Produce under certified quality schemes
	Product information	Maintain complete traceability of agricultural production at the plot level Identify and describe the agricultural operation and maintain records of the main actions in a digital farm notebook

Practices of the agricultural and livestock economic bloc of the PAS, organised by theme and sub-theme. Source: DARPA.

respond to consumer demands. Commercial channels also value transparency and food safety.

What do they contribute to society?

More food safety

Responsible management of phytosanitary products and waste control guarantee safer food for consumers.

Greater transparency and trust

Traceability and clear information about the origin and production process reinforce consumer confidence in local and sustainable products.

A more competitive agricultural sector prepared for the future

Economically viable and well-managed farms contribute to the stability of the territory and promote generational renewal.

08. A meaningful evolution, not an obligation

This set of practices is not a closed or immutable list. These practices are a starting point in the Sustainable Agricultural Production model, but they will evolve over time, as a result of the new scientific and technical knowledge available —thanks to the work of research centres such as the IRTA— and, above all, they also aim to highlight everything that the agricultural sector already does well.

All these practices share a vision: that food production can be compatible with a well-kept, living, dynamic territory, with a robust economy and a healthy society.

Producing under certified quality schemes. Photo: Plusfresc.

Authors:

Joan Bonany Rocas
Director of the Mas Badia agricultural experimental station. Fruit growing programme. IRTA.
joan.bonany@irta.cat

Georgina Alins Valls
Researcher specialising in ecological infrastructure and regenerative agriculture. Fruit growing programme. IRTA.
georgina.alins@irta.cat

Francesc Domingo Olivé
Specialist researcher with the Sustainable Extensive Crops programme.
francesc.domingo@irta.cat

Miquel Peris Giner
Specialist researcher in the management of fruit plantations. Fruit growing programme. IRTA.
miquel.peris@irta.cat

Maria del Mar Català Forner
Specialist researcher on rice. Sustainable Extensive Crops programme. IRTA.
mar.catala@irta.cat

Jordi Cabrefiga Olamendi
Technician with the Sustainable Plant Protection programme. IRTA.
jordi.cabrefiga@irta.cat

Carles Faro Buira
Technician with the Post-Harvest programme. IRTA.
carlos.faro@irta.cat

Mireia Puig Garcia
Technician with the Post-Harvest programme. IRTA.
mireia.puig@irta.cat

Diana Ramirez Llorente
Head of the Animal Production Infrastructure platform. Chair of the Animal Experimentation Ethics committee. IRTA.
diana.ramirez@irta.cat

Marta Ruiz Colmenero
Researcher specialising in life cycle analysis. Sustainability in Biosystems programme. IRTA.
marta.ruiz@irta.cat

Víctor Rancaño García
Technician in Life Cycle Analysis. Sustainability in Biosystems programme. IRTA.
victor.rancano@irta.cat

Ariadna Bàllega Calvo
Technician in Life Cycle Analysis. Sustainability in Biosystems programme. IRTA.
ariadna.ballega@irta.cat

DATA TO GROW:
how to assess agricultural sustainability and move together towards a greener digital future

Connected agriculture: data to grow. Photo: image from Freepik.

01. Introduction: data as a driver of change

In 21st century agriculture, data is as essential as productive resources can be. Accumulated experience or intuition is no longer enough: we need precise, current and well-organised information that allows us to make good decisions. In this context, digitalisation becomes a transformative tool, which can make the difference between a farm that simply survives and one that thrives.

Every action taken in the field or on the farm—an irrigation application, a sowing, a harvest, an application of manure—generates data. But this data, if not collected or processed appropriately, ends up being lost and not used. The idea is that, with digitalisation and the information obtained, resources can be optimised, costs reduced, sustainability improved and better adapted to the challenges of climate change and the market.

This article aims to show how tools such as the sustainability calculator can help transform this data into strategic decisions. In short, knowledge must be put at the service of the agricultural sector, so that work in the fields and on livestock farms is made easier and resources can be saved and farm management improved.

02. The era of the digital revolution in the countryside

Agriculture and livestock are undergoing a silent but profound transformation: digitalisation is changing the way farming is performed, how a farm is managed and how the tasks that need to be done are planned. This revolution is ultimately based on using digitalised information to make better decisions.

Today, farm owners can use sensors to monitor soil and irrigation, use drones to assess the growth status of crops, apply fertilisers with precision thanks to geolocation, monitor the

amount of feed distributed, control the temperature of the farm, among other available options, linked to digitalisation and data processing.

When data are collected systematically and processed appropriately, they become knowledge. Knowledge that allows us to optimise the use of water, phytosanitary products, fertilisers and energy; reduce costs; anticipate problems and, above all, make more informed decisions.

Digitalisation, therefore, is not just a tool to make the farm more efficient, but a lever to make it more sustainable, more resilient and more competitive. It is an opportunity to empower farmers and livestock breeders and connect them with a new way of doing things, data-driven, results-oriented and committed to the future.

03. How the sustainability calculator can help with digitalisation

For data to be truly useful, they need to be well organised and structured. In this context, the sustainability calculator becomes a key tool for the digitalisation of the agricultural sector developed by the Department of Agriculture, Livestock, Fisheries and Food, with the collaboration of the Institute of Agro-Food Research and Technology (IRTA). This public digital tool allows all relevant information from an agricultural or livestock farm to be recorded and analysed in a structured manner.

> The agricultural sustainability calculator is user-friendly and uses digitalised data from digital notebooks, transforming them into useful information for decision-making.

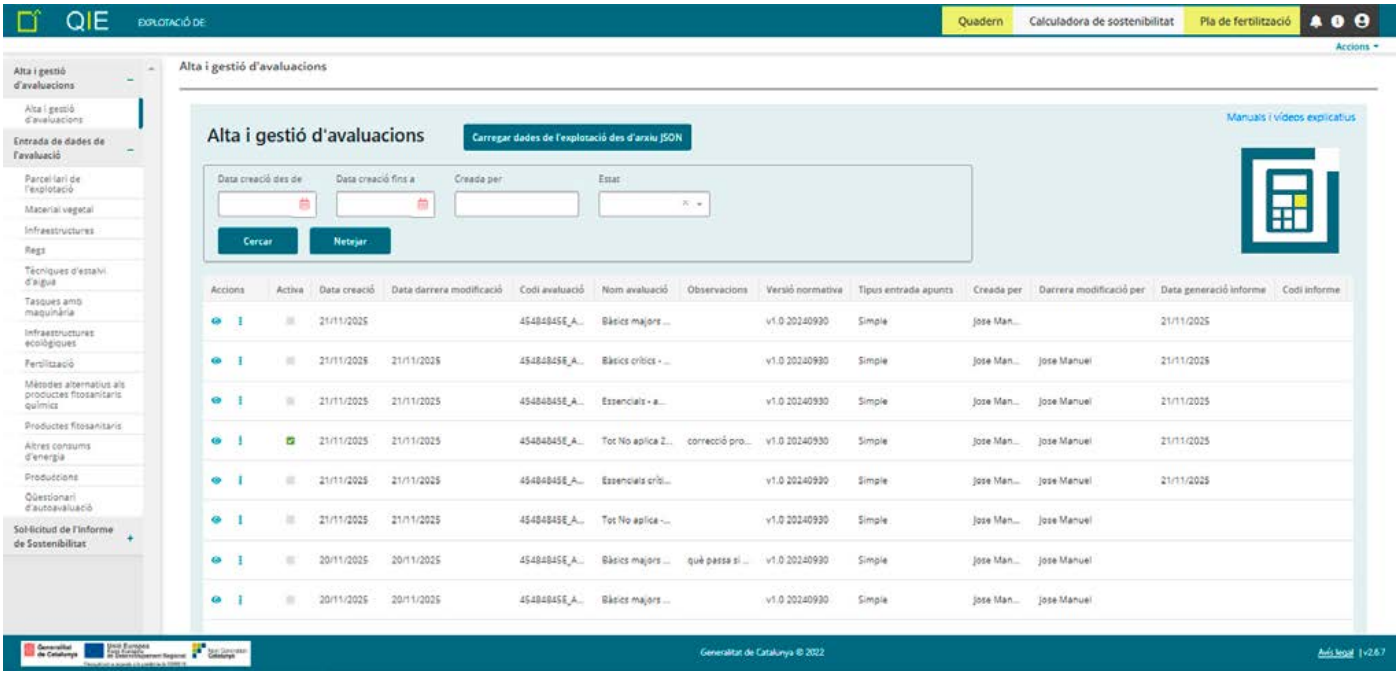
The calculator integrates data from different sources, including digital notebooks such as the Integrated Operating Book (QIE), and is compatible with systems that generate the PAS exchange file. This interoperability facilitates automatic data import and ensures efficient and centralised information management.

Based on the digitalised data, the tool allows for:

- Processing and analysing initial information, such as, for example, in the agricultural case, that related to crops, irrigation, fertilisation, the use of machinery and the implementation of sustainable practices and production.
- Generating a sustainability report with key indicators and specific recommendations.
- Evaluating the sustainability of the operation.

The operation is simple and accessible: the farmer can enter the data manually or import them from another digital medium, answer a self-assessment questionnaire and automatically obtain a visual and detailed report. This report shows the strengths and areas for improvement in relation to the sustainability of the agricultural operation, and can be used to access aid, communicate environmental commitments or plan improvement strategies.

In addition, the sustainability values generated are comparable and transparent, which contributes to combat-



Screenshot of the "Registration and management of assessments" functionality of the PAS Calculator, integrated within the QIE public digital notebook. Source: DARPA.

ing practices such as greenwashing, as it means clear evidence is required about the sustainable practices applied and the results obtained.

In short, the sustainability calculator is not just an evaluation tool, but a digital compass that guides farms towards a smarter, more responsible and competitive future, transforming data into useful knowledge for decision-making.

04. How data can help on the path to improving sustainability

Having data is just the first step. The true value of digitalisation is manifested when these data are translated into information that allows specific actions to be taken to promote the sustainability of the operation. This is precisely what the sustainability calculator achieves: transforming information into strategy and decision-making.

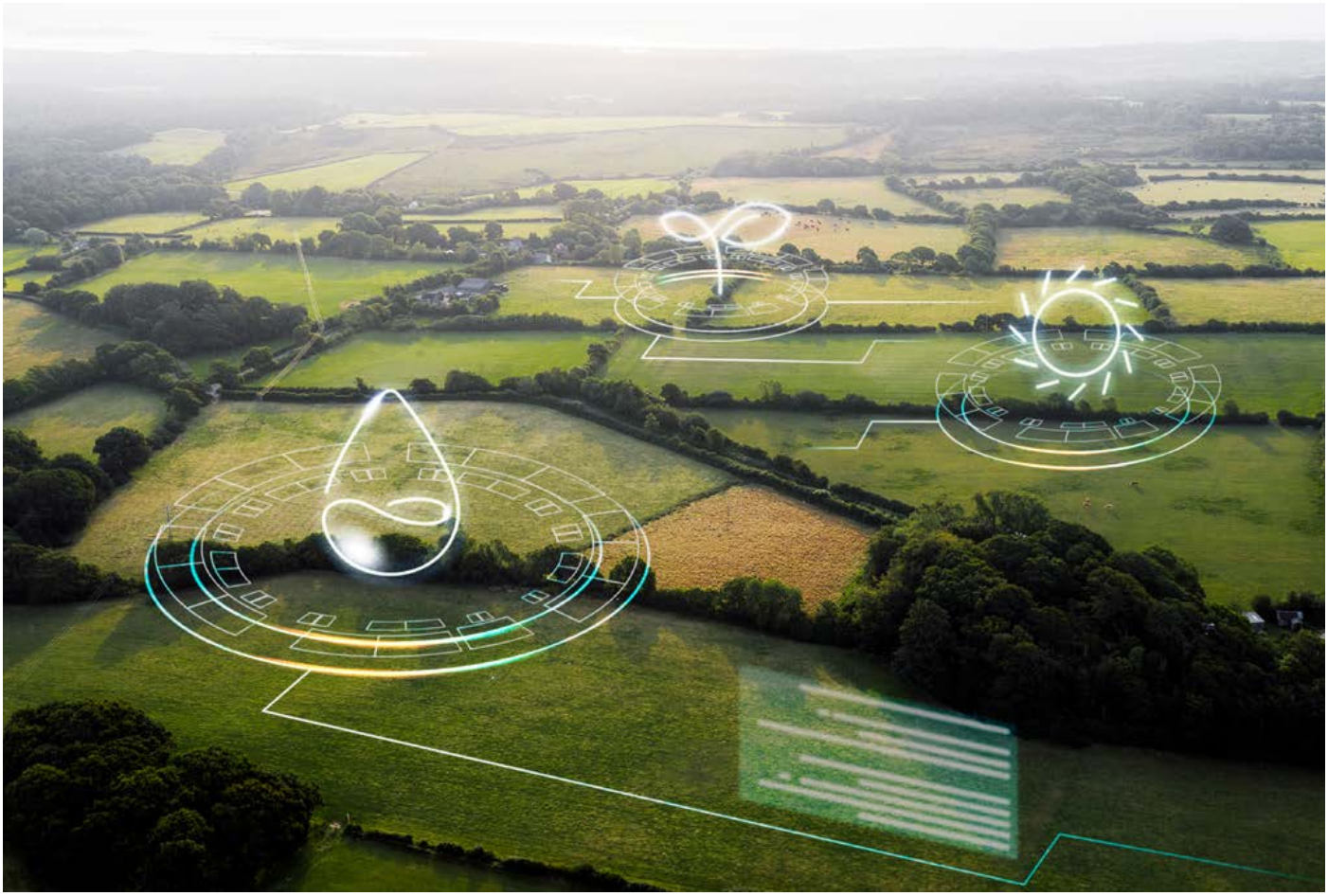
The report generated by the calculator offers a visual and easy-to-interpret sustainability profile. Farmers can see graphically and immediately how their farm behaves in different environmental aspects: water use, soil conservation, emissions, biodiversity, energy and materials, among others. Each point on the graph represents a sub-theme, and its position indicates the level of sustainability achieved. The colours, which range from maroon to deep green, show the capacity for self-improvement in every aspect.

This profile not only serves to take a snapshot of the current situation, but also acts as a guide for continuous improvement. For example:

- If the nitrogen balance is not zero, fertiliser doses need to be adjusted.
- If the carbon footprint is high, farming practices, machinery use, energy sources or inputs at the farm can be reviewed.
- If biodiversity is low, ecological infrastructure or new crops or varieties can be incorporated.

In addition, the aggregate analysis of different reports obtained—such as the 998 analysed within the framework of the Strategic Food Plan—allows us to identify sectoral trends and areas with the greatest room for improvement. For example, in the case of agriculture, it has been detected that biodiversity is one of the weakest points in many farms, while soil management presents good results.

This collective knowledge can guide public policies, aid programmes and training actions. But, above all, it allows the farmer to make informed decisions, adapted to their reality and oriented towards a more sustainable future.



Connected fields to move towards data-driven agriculture. Photo: DARPA with Freepik stock images.

Data that generates opportunities. Photo: Pixabay.

05. What does digitalisation bring to a farmer or livestock breeder and to the territory as a whole?

Digitalisation has a direct and measurable impact on the reality of farms and the territory in which they operate.

For the farmer or livestock breeder, it brings the following benefits:

- Improve profitability: having accurate data allows us to optimise the use of inputs such as water, fertilisers or energy, reducing unnecessary expenses and improving production efficiency.
- Access to grants and financing: many lines of aid, such as those included in the Strategic Food Plan (PEAC), positively value the availability of a sustainability report, obtained thanks to prior digitalisation of the information.
- Better positioning in the market: with objective data, the farmer's or livestock breeder's commitment to sustainability can be demonstrated and this increases the trust placed in these producers by consumers, distributors and cooperatives. This is an added value that can make a difference in an increasingly demanding market.
- Strategic planning: with clear information about the strengths and weaknesses of the operation, short, medium and long-term improvement actions can be planned.

At a territorial scale, digitalisation contributes to:

- More resilient agriculture and livestock: those farms that are more sustainable are better prepared to deal with extreme climatic phenomena and market variability. The fixation of the rural population: improving profitability and quality of life reduces the risk of abandonment of the territory.
- The definition of more tailored public policies: aggregate data analysis allows the Administration to better understand the reality of the sector and design more efficient and adapted measures.

In short, digitalisation not only transforms individual farms, but also has a multiplier effect on the entire agri-food system and the rural territory as a whole.

06. Digitalise so that farmers, technicians and the Administration can move forward together

Sustainability is not an individual challenge, but a collective one. Therefore, tools such as sustainability calculators have a value that goes well beyond the operation that uses them. When these tools are widely adopted, they become a shared knowledge infrastructure that benefits the entire sector.

Each sustainability report generated provides valuable information not only for farmers and livestock breeders, but also for the technicians who advise them and for the Administration responsible for defining public policies. When these data are analysed in an aggregated manner, this allows trends to be identified, critical points to be detected and resource planning and actions to be optimised.

Digitalise so that farmers, technicians and the Administration can move forward together. Photo: Freepik.

This shared vision opens the door to a new way of working: more collaborative, more transparent and more efficient. Technicians can offer advice that is better tailored to the reality of each farm. Researchers can validate practices and develop new solutions based on real data. Likewise, the Administration can design grant programmes, regulations and support strategies that are more aligned with the needs of the territory.

In this regard, digitalisation not only empowers farmers and livestock breeders, but also creates bridges between all the stakeholders in the agri-food system and becomes a language based on data, evidence and shared objectives. It is a tool to move forward together towards more sustainable, fairer and more prepared agriculture and livestock farming for the challenges of the future.

07. Digital and sustainable future

Agricultural sustainability is no longer an abstract idea or a distant goal: digitalised data are much more than numbers; they are is a source of knowledge, a basis for decision-making and an opportunity to transform the sector. As a result of digitalisation, agricultural producers are better able to understand their farm, identify their weaknesses, take advantage of strengths and plan actions that improve profitability, resilience and environmental commitment.

This path towards more sustainable agriculture should not have to be taken alone. Digital tools facilitate collaboration between farm owners, technicians, researchers and the Administration, creating a network of shared knowledge that can drive significant changes.

Ultimately, the future of the agricultural sector lies in digitalisation and the ability to convert data into decisions. Measuring is the first step towards improvement. And getting to know the operation better is, today, one of the smartest decisions that any professional in the field can make.

Authors:

Joan Bonany Rocas
Director of the Mas Badia agricultural experimental station. Fruit growing programme. IRTA.
joan.bonany@irta.cat

Rosa Mari Pedrol Esteve
Coordinator of Integrated Production. DARPA.
rmpedrol@gencat.cat

Lluís Soria Ruiz
Technician from the Integrated Production Unit. DARPA.
luismiguelsoria@gencat.cat

José Muñoz Guijarro
Technician from the Integrated Production Unit. DARPA.
josemanuelmunoz@gencat.cat

SUSTAINABILITY REPORTS: a snapshot of the level of sustainability of an agricultural operation

01. Measuring agricultural sustainability: an objective, transparent and data-based assessment

In an agricultural sector that is increasingly complex and subject to growing challenges, sustainability is no longer just an objective: it is an essential priority. In recent years, several initiatives have appeared—mostly private—that talk about sustainability, but do not evaluate or quantify it.

This raises key questions: How do we know if a farm is truly sustainable? How can we measure it objectively? How can we compare similar farms and identify opportunities for improvement?

The answer lies in collecting and analysing real data from the farm itself. This is where the Sustainability Calculator from Sustainable Agricultural Production (PAS) takes centre stage, as the tool that generates sustainability reports.

The PAS calculator is the freely accessible digital tool that collects real data from the farm such as water use, fertilisers, phytosanitary products, energy, biodiversity practices, animal welfare or waste management and transforms them into key indicators such as the carbon footprint, water footprint or nutrient balance.

The sustainability report is a document that qualifies and quantifies the sustainability of an agricultural operation. It presents the sustainability profile, the main sustainability indicators and classifies the operation according to its level of sustainability (Fig. 1).

One of the central elements of the sustainability report is the sustainability profile (Fig. 2), represented with a surface area graph. It currently shows the results of the environmental bloc, but

Figure 1. *Content of a sustainability report. Source: DARPA.*

it is planned that during 2026 the economic and social blocs will also be incorporated, completing a comprehensive evaluation. In this graph, the black line indicates the behaviour of the operation in relation to the different sub-themes within each bloc - environmental, economic and social. The colours, which range from deep green to maroon, symbolise the farm's capacity for self-improvement: the greener it is, the more aligned it is with best sustainability practices.

In addition, the report integrates 7 of the 16 Product Environmental Footprints (PEF) and several specific PAS indicators, such as the ecological infrastructure index, nitrogen and phosphorus balances, the organic origin of macronutrients and the total load of phytosanitary products. All of them are aligned with European regulations.

- Level C: they meet the essential requirements, good agricultural and environmental conditions (BCAM) and legal management requirements (RLG) related to sustainability.

- Level B: they also implement the sustainability practices defined by the standard.

- Level A: they obtain high results in key indicators (footprints, balance sheets, infrastructure assets and phytosanitary measures).

When a farm knows its level of sustainability, it can begin to change its future.

Knowing where you are now is the first step to knowing where to go. Every piece of data collected becomes an opportunity to improve, grow and save.

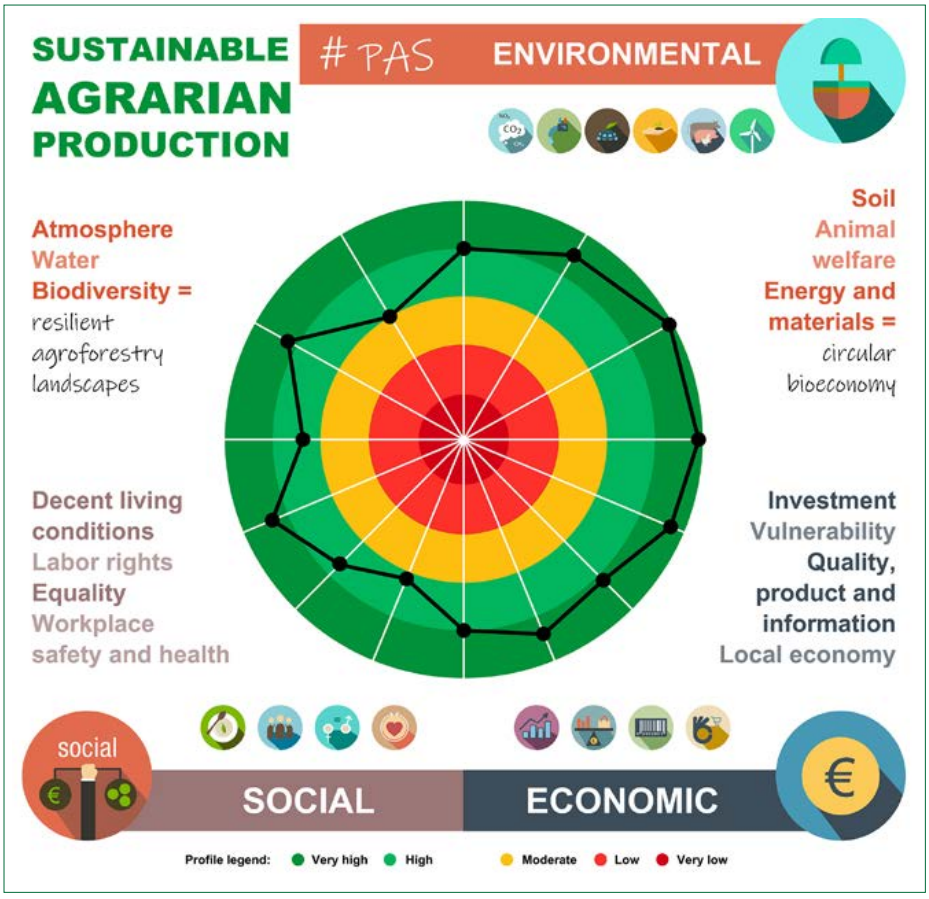


Figure 2. *Sustainability profile with environmental, social and economic blocs. Source: DARPA.*

It is planned that farms with Level A or B will be able to access a public and voluntary certification that makes their commitment to sustainability visible.

02. What are sustainability reports for?

Sustainability reports offer a clear and objective diagnosis of the situation of each farm in relation to sustainable practices. They are an essential tool for making decisions, improving management and moving towards more efficient and environmentally friendly production.

Detect strengths and areas for improvement

- Identify what is being done well and what needs to be strengthened.

Optimise existing practices

- Analyse data to find out which practices are poorly implemented.
- Improve efficiency, reduce costs and increase profitability.

Learn from leading farms

- Learn about successful models.
- Exchange knowledge between producers.
- Benchmark with similar farms.

Analyse by crop or variety

- Detect crops with the greatest environmental impact.
- Adjust practices according to the production context.

Identify common needs of the sector

- Detect widespread shortcomings.
- Guide training policies and programmes.

In short, sustainability reports not only offer a snapshot of the present, but also acts as a planning and innovation tool that helps us to tackle environmental, economic and social challenges, and transform individual knowledge into a collective resource that can improve the sector as a whole.

03. The first sustainability reports: results and lessons learnt

During the 2023-2024 campaign, the Sustainability Calculator was launched, which generated the first reports based on data collected from 998 agricultural farms in Catalonia during the 2023-2024 campaign.

The farms mostly had a production orientation in the agricultural sectors of sweet fruit and vegetables and in the dairy livestock sector (sheep, cattle and goat species).

The distribution by production systems of the farms analysed in the 2023-2024 campaign can be seen in Figure 3, which shows the distribution of the 998

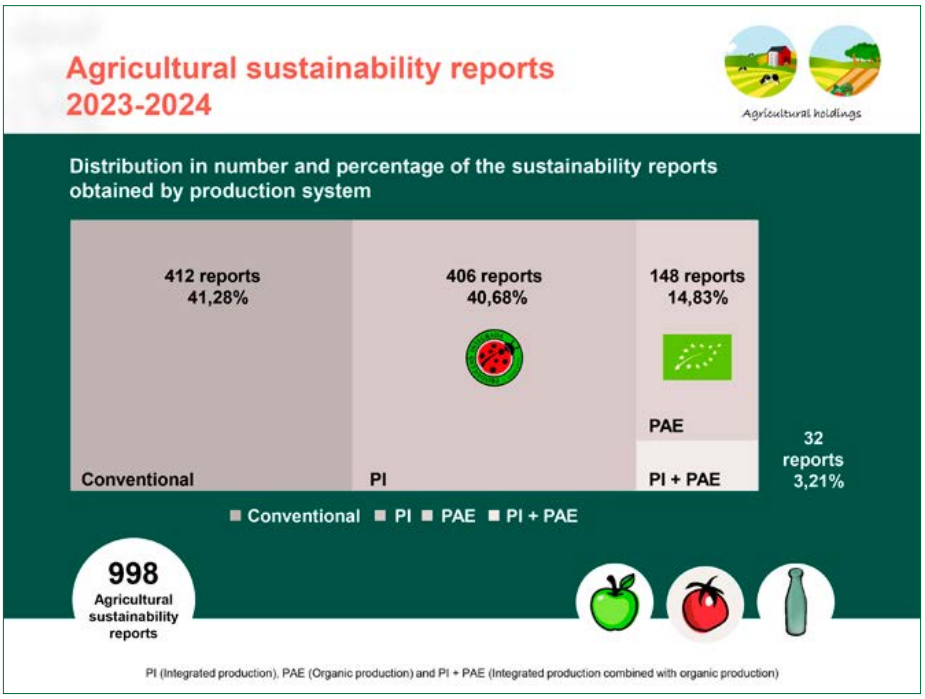


Figure 3. *Distribution in number and percentage of sustainability reports obtained by production system during the 2023-2024 campaign. Source: DARPA.*

Figure 4. *Distribution by region of sustainability reports generated in the agricultural and livestock sector during the 2023/2024 campaign. Source: DARPA.*

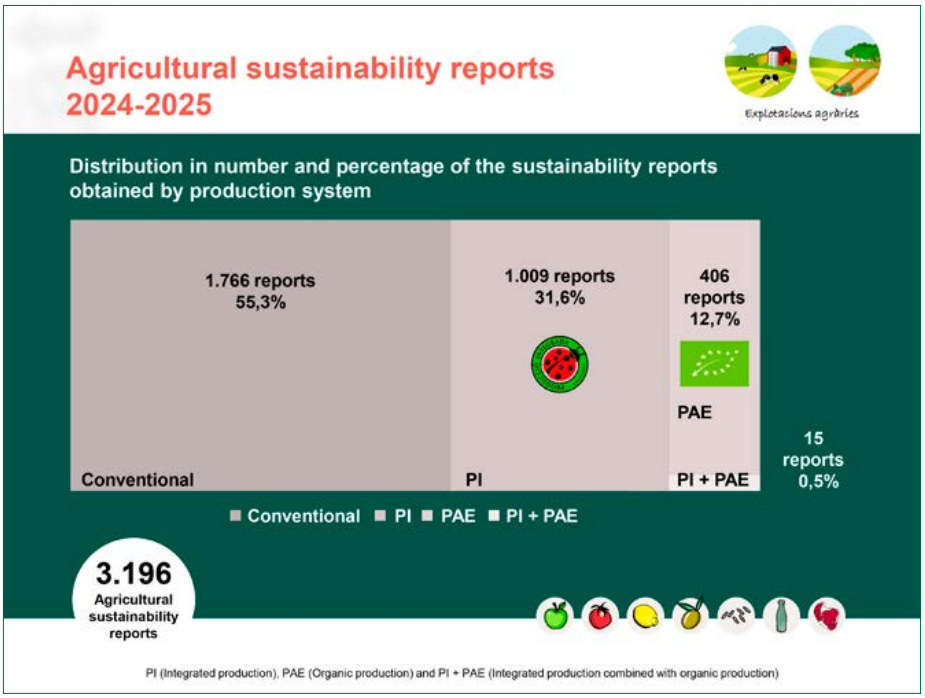


Figure 5. *Distribution in number and percentage of sustainability reports obtained by production system during the 2024-2025 campaign. Source: DARPA.*

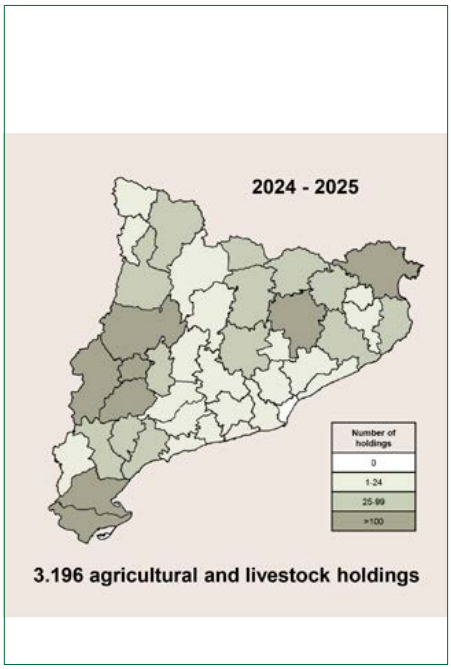


Figure 6. *Distribution by region of sustainability reports generated in the agricultural sector during the 2024-2025 campaign. Source: DARPA.*

sustainability reports obtained during the 2023–2024 campaign, depending on the production system of the farms that generated them. 41.28% of the reports correspond to conventional production farms (412 reports), 40.68% to integrated production farms (IP) (406 reports), 14.83% to farms that carry out organic agri-food production (PAE) (148) and 3.21% correspond to farms that combine IP and PAE (32 reports).

During the 2023-2024 campaign, the launch of the Sustainability Calculator allowed the first reports to be generated with data from 998 farms. In the 2024-2025 campaign, this figure increased to 3,196 farms.

This distribution reflects that sustainability is today a shared interest for agricultural farms belonging to all production systems, and that the agricultural sector, as a whole, is committed to incorporating tools for evaluating and improving sustainability.

Figure 4 shows the distribution by region of the number of farms that have generated their sustainability report during the 2023-2024 campaign.

In the second year (2024-2025 campaign), 3,196 farms used the calculator and obtained their sustainability reports.

The farms that calculated their level of sustainability have the following production orientations: for the agricultural sector they are predominantly sweet fruit, horticultural, citrus, olive and rice farms and, in the livestock sector, the production orientations are of cattle, sheep and goats for meat and milk.

The distribution of reports by production system in the 2024-2025 campaign is shown in Figure 5.

Figure 5 shows the distribution of the 3,196 sustainability reports generated during the 2024–2025 campaign, a figure that has increased very significantly compared to the previous year. The data confirm that sustainability continues to arouse interest in all production systems.

Conventional production farms represent 55.3% of the reports (1,766), followed by integrated production (IP) farms, which account for 31.6% of the reports (1,009). Organic agri-food production (PAE) farms contribute 12.7% of the reports (406), while those that combine IP and PAE represent 0.5% (15 reports).

This overall increase, together with the presence of all production systems, indicates that this second campaign reaffirms the sector's commitment to sustainability. In addition, new production sectors are being incorporated that show interest in evaluating and quantifying sustainability, such as citrus fruits, olive trees, rice and beef cattle breeding.

Overall, these data show sustained and cross-cutting growth in the number of sustainability reports obtained, and demonstrate that responsible and data-based management is today a priority shared by the entire sector.

Figure 6 shows the distribution by region of the number of farms that have generated their sustainability report during the 2024-2025 campaign.

The aggregate results obtained from the sustainability reports of the 2023-2024 and 2024-2025 campaigns have allowed:

- Determination of the level of sustainability of all participating farms.
- Analysis of the specific PAS indices, as well as the 7 indicators of the 16 Product Environmental Footprint (PEF) defined by the European Commission.
- Classification of farms according to their level of sustainability through a standardised categorisation (levels A, B and C).
- Identification of trends and priority areas for improvement, providing strategic information for planning and decision-making.

To find out more

The results of the analysis of the sustainability reports are available using this QR code.

Authors

Joan Bonany Rocas
Director of the Mas Badia agricultural experimental station. Fruit growing programme. IRTA.
joan.bonany@irta.cat

Marta Ruiz Colmenero
Researcher specialising in life cycle analysis. Sustainability in Biosystems programme. IRTA.
marta.ruiz@irta.cat

Rosa Mari Pedrol Esteve
Coordinator of Integrated Production. DARPA.
rmpedrol@gencat.cat

We talk to:
MARIA FUENTES MERINO

Maria Fuentes Merino has an Economics degree from the University of Barcelona (UB), with a Master of Sciences in Economics and Agrarian Policy at the Institut Agronomique Méditerranée de Montpellier. She developed her career as a researcher in agricultural economics at the National Institute for Research on Agriculture, Food and the Environment (INRAE) (France) before joining the European Commission, where she has worked for 26 years. Throughout her career she has held positions in various services, mainly in environmental and climate units, and has coordinated France's Rural Development Programmes (PDR) for eight years. For five years she has been part of the horizontal unit for environmental sustainability, where she works on CAP instruments to support European environmental and climate objectives, and currently also coordinates the eco-schemes.

What approach do you think the European Union is adopting in the field of agricultural sustainability?

We can be proud of our food system, capable of supplying safe, quality and affordable products to more than 450 million Europeans. We are also capable of exporting surpluses to world markets, with a key agricultural sector that is resilient, innovative and a driver of environmental sustainability, despite being vulnerable to climate change and environmental degradation.

Precisely, we want the European food system to be competitive, low in greenhouse emissions, climate and environmentally resilient. In the global context, food security and agricultural production are essential components of European security and prosperity. Therefore, strengthening the competitiveness and resilience of the food system must be prioritised, moving towards more sustainable models in a fair and inclusive manner.

At the beginning of the year, we published the roadmap for the European agri-food sector towards 2040 with a vision. This document will guide the European Commission's action to support the long-term competitiveness and sustainability of the sector and to ensure that all European policies work in accordance with this vision and adapt to new realities. Therefore, improving the role of the agricultural sector in climate action will be one of the main objectives of the CAP 2028-2034.

> Without economic viability, transforming production systems is difficult, as it requires investment, time and risk management. Improving the role of the agricultural sector in climate action will be one of the main objectives of the CAP 2028-2034.

This vision aims for the agricultural sector to be able to contribute decisively to the EU's environmental and climate objectives and to also be able to obtain benefits from them, taking into account economic and social challenges. Without economic viability, we will not achieve it. Their ability to produce food and withstand crises depends on healthy ecosystems, and environmentally friendly practices such as agroecological solutions improve resilience to resource scarcity and climate change.

What elements do you consider most important to promote agricultural sustainability?

They include public and private financial support, demand policies, consumption behaviour, actions in the food chain or existing regulations.

To move towards low-emission agriculture, with a reduced impact on natural resources, which is resilient and economically viable, we need coordinated actions at European, national and regional levels. These actions must include political, regulatory and market measures at all stages of the food system.

Sustainable Agricultural Production (SAP) is a good example for understanding the sustainable agroecological transition as a dynamic process, where each sector is different and enables visualisation of the efforts of the agricultural sector.

To move towards low-emission agriculture, with a reduced impact on natural resources, which can be resilient and economically viable, we need coordinated actions at European, national and regional levels.

Regarding the next CAP, incentives will be prioritised over restrictive regulations, to guide the transition of the sector and give farmers room to adapt. In the proposals for the period 2028-2034, the European Commission proposes a simplified "green architecture", which seeks a better balance between requirements, incentives and investments for better performance.

Is agroecology key to future agricultural models?

Yes, it is. Agroecology is a broad approach that applies ecological and social principles to agriculture with actions such as managing soil health, reducing inputs, caring for biodiversity, synergies between crops and animals, and recycling.

The current CAP already provides significant support for the transition towards more environmentally friendly practices, such as organic farming and integrated production. Many farmers already adopt these practices, although they have concerns about economic viability and the effects of climate change. By 2024, agri-environmental and climate schemes and commitments have been applied to almost 60% and 10% of the agricultural area of the European Union, respectively.

In the proposals for the CAP 2028-2034, we propose specific support for this green transition. It could be through financial support per farm of up to €200,000 to cover the costs and risks of changing production methods towards more agroecological approaches (such as PAS), but also investments and advisory needs. Farmers will submit transition plans to the competent authorities for approval, and member states will have flexibility to define their management.

Another option is to promote, at a European level, conversion to organic agriculture, and at a national level, integrated production and Sustainable Agricultural Production. Likewise, other production models can be promoted such as regenerative agriculture, agroforestry, extensive grazing systems, among others. These proposals will be debated by the Council and the European Parliament before the adoption of the regulations for the period after 2027.

How do you assess the Sustainable Agricultural Production (PAS) project that is being promoted in Catalonia? And how does it align with the European Commission's proposals?

PAS is a valuable project that DARPA and IRTA presented to the General Directorate for Agriculture and Rural Development of the European Commission in early 2025. This tool evaluates, classifies and measures the progress of Catalan farms according to their level of environmental, social and economic sustainability, using an objective and quantitative methodology.

This is a holistic and inclusive approach that encompasses the entire operation and allows sustainability reports to be prepared for all types of productive sectors.

The Strategic Dialogue on the Future of EU Agriculture (2024) recommended defining a new approach to achieving sustainability that would involve an EU-wide benchmarking system in agricultural and food systems, with the aim of harmonising farm assessment methodologies. Along these lines, the "Vision for Agriculture and Food" proposes the development of a "sustainability compass" at Europe-wide scale. PAS aligns with this objective and can serve as a reference for future European evaluation systems.

Do you know of any similar initiatives in other European countries?

We are still mapping the existing systems and it would be pre-

mature to determine their comparability. However, the PAS model has been taken into account and coincides with the objective that the Commission's Directorate-General for Agriculture wants to achieve with the future "sustainability compass".

What is the role of digitalisation in monitoring the sustainability of agricultural operations? Do you think it can be a barrier or even a significant barrier to the adoption of systems like PAS?

We are still mapping the existing systems and believe that the deployment of digital technologies can help agriculture and rural areas strengthen their competitiveness and environmental and socio-economic sustainability. New technologies offer opportunities to improve the working and living conditions of farmers and facilitate administrative and technical control of farms.

For the first time, member states have developed digitalisation strategies within their CAP strategic plans, in synergy with other European programmes such as the Recovery and Resilience Mechanism, the Connecting Europe Facility, Horizon Europe or the Digital Europe programme.

Within the CAP's strategic plans, digitalisation is mainly supported by investment projects, but also by eco-schemes and agri-environmental and climate commitments, which reflects its cross-cutting relevance. Romania, Poland and Estonia, among others, have planned investments in precision agriculture. In parallel, Member States are investing in an enabling environment for digitalisation by promoting the roll-out of broadband in rural areas, digital skills, advisory services and exchange of knowledge on digital matters through the strengthened AKIS. EIP-AGRI projects and smart villages further contribute to promoting the digital transformation of agriculture and rural areas.

Initiatives funded through Horizon Europe, the EU's key funding programme for research and innovation, contribute to the aim of modernising the agricultural sector by fostering and sharing knowledge, innovation and digitalisation in agriculture and rural areas. Several projects are developing or testing digital solutions to improve the capacity to implement and monitor the CAP effectively through specific use cases (e.g. DIVINE 9, Agridatavalue 10, GUARDIANS 11). Knowledge and innovation resulting from Horizon Europe activities are made available to farmers, foresters, rural communities and other stakeholders through thematic and advisory networks. These networks include activities carried out by projects, such as the SmaRT12 thematic network, which promoted the use of precision farming and digital technologies across the livestock sector, as well as advisory network projects such as FAIRSHARE13, which worked to integrate digital tools into various agricultural advisory contexts across the EU.

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What role should technological innovation and research play in improving agricultural sustainability?

In fact, we consider that innovation and research are key factors in improving agricultural sustainability and better combining environmental performance with productivity. Several dimensions of innovations can help reconcile ecological sustainability with productivity and food security. However, innovation should reach producers through knowledge creation, advisory support for practical and technological solutions, and cooperation projects. The current and future CAP will continue to support these cross-cutting measures.

What message can you give to farmers, livestock breeders and professionals in the agri-food sector who are working to transform their production systems towards more sustainable and resilient models? How can the European Commission continue to support them on this path?

We encourage EU farmers to adopt more environmentally and climate-friendly practices, supported by the national strategic plans in the CAP, which are underway and evolving positively.

The proposal for the next CAP maintains the current instruments: direct payments, voluntary agri-environmental aid, investment support and operational programs, but with more flexibility for countries and fewer rules at the European level, following the path of simplification.

What has been a major change is the governance and organisation of the CAP, which, for the first time, will be integrated into future national and regional partnership plans, which will have a single fund (for regional policy, cohesion, fisheries, migration and others).

Ultimately, it is not about the EU being a "champion of sustainable agriculture", but rather about sustainability being a strategic option for the sector itself to invest in its own future.

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