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TRANSITION PROGRESS REPORT
NAVARRA 360º
2025 campaign

Territorial regenerative transition model
Production, soil, climate, biodiversity and water



Partners

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

2. FRAME OF REFERENCE

3. AGRONOMIC CONTEXT

4. MONITORING REGENERATIVE PRACTICES

5. IMPACT RESULTS

- **Block 1.** Soil health. Soil analysis
- **Block 2.** Optimisation of fertilisation. Efficiency in the use of N, P and K
- **Block 3.** Crop protection optimisation. Efficiency in the use of crop protection products and EIQ
- **Block 4.** Water. Watering volume
- **Block 5.** Biodiversity. Area dedicated to habitats and number of species cultivated
- **Block 6.** Climate. CO_2 equivalent emissions

6. CONCLUSIONS

7. STRATEGY, SCALABILITY, AND POTENTIAL FOR 2026

1. EXECUTIVE SUMMARY

Building a more resilient European food system requires more than changes on individual farms, calling for coordinated action that brings farmers, industry, researchers and other stakeholders together to support the transition towards more sustainable and regenerative agricultural practices. This is the approach behind EIT Food's regenerative agriculture landscapes, which aim to accelerate adoption, strengthen collaboration and scale solutions across agricultural territories.

Navarra 360° is one of these landscapes. Launched in 2024 in northern Spain, the initiative brings together 38 participating farms covering more than 5,300 hectares. Through tailored technical support, field monitoring and collaboration, it helps farmers adopt and improve regenerative practices while building evidence of their environmental and agronomic performance.

This **Transition Progress Report presents the results of the 2025 growing season**, assessing progress in regenerative practice adoption and examining developments across key areas, including agricultural productivity, soil health, climate, biodiversity and water.

Environmental and agronomic impact transitional progress report 2025

Navarra 360° confirms in 2025 that it is possible to produce with less impact: The project, implemented on 38 farms and more than 5,300 ha, has achieved strong reductions in fertilisation and emissions, especially in wheat and barley, laying a strong foundation for scaling up regenerative agriculture by 2026.

The findings show encouraging progress in the adoption of regenerative practices. **Compared with the 2024 baseline, the area under no-till management increased by 15%, reaching 2,572 hectares, while minimum tillage expanded by 108% to 675 hectares. The area where crop residues are retained on the soil surface also increased by 41%, reaching 2,122 hectares. These practices can help protect soil structure, improve water retention and support biodiversity over time.**

The report also identifies progress in fertilisation management and reductions in associated emissions, particularly in wheat and barley production. These findings suggest opportunities to improve resource efficiency and reduce the environmental footprint of agricultural production, while highlighting the importance of continued monitoring to understand longer-term impacts.

The results show that farmers are progressing from different starting points. Some had already adopted regenerative practices before joining the initiative, while others are beginning to introduce new approaches. This reinforces the need for tailored advice, continuous technical support and monitoring that reflects local farming conditions.

Looking ahead to 2026, Navarra 360° will focus on consolidating and expanding the practices already introduced, with particular emphasis on optimising fertilisation, reducing soil disturbance and minimising the use of crop protection products.

Beyond the progress recorded on participating farms, Navarra 360° illustrates the value of EIT Food's landscape approach: connecting farmers, technical expertise and shared measurement to support the transition at a wider scale. The lessons generated through the initiative can help inform similar efforts across Europe, contributing to EIT Food's wider ambition to make agriculture more resilient, sustainable and productive.

2. FRAME OF REFERENCE

Territorial scope and distribution

In 2025, the Navarra 360° project brought together a network of 38 agricultural farms totalling 5,313 hectares, distributed in six regions of Navarre. Most of the participants have integrated 100% of the surface area of their farms into the programme.

By agricultural regions, the leading region in area is VII-Ribera Baja, with 1,987 ha (11 large farms). In the middle zone, the region with the most farms is V-Navarra Media, with 11 farms, but with smallholdings making a total of only 922 ha (50% less area per farmer than in the Ribera Baja). And, finally, the lowest representation in the project is in the II-Región Pirineos, with 234 ha distributed in only 2 small-medium farms.

Official campaign progress:

The 2025 cereal growing season in Navarre was a good, although not exceptional, year, historically consolidating itself as the fourth with the highest grain production in the Autonomous Community. The official balance presented by the public company INTIA and the Government of Navarra highlights the following key points:

Total production of 880,000 tonnes of grain (including wheat, barley, oats, triticale, rye, grain legumes and rapeseed) was achieved. This figure represents 6% less volume harvested compared to the record campaign of the previous year.

The specific performance of each of these crops in the region during the growing season explains the yield ceilings and climatic anomalies recorded:

Wheat: It has consolidated its position as the main crop in Navarre (41% of the surface area). It had a good or very good general performance in all areas. However, in the northern and fresh dry

regions (such as the Pamplona Basin), continuous excess moisture penalized the optimal filling of the grain, which aligns with yield accidents (such as hail and furrowing).

Barley (Malting and Feed): It registered an outstanding agronomic success. Abundant rainfall in arid and semi-arid areas of the Middle Zone and the Ribera (where the project has a strong presence of hectares) pushed barley yields to record highs, offsetting declines in the north.

Oats: Maintained stable productions and progressive ripening benefited by the mild temperatures of spring, consolidating the harvests without critical incidents of lodging despite the rainy regime.

Rapeseed: It was the star crop of the 2025 growing season in Navarre, achieving an all-time productivity record with average yields in dry lands above 3,300 kg/ha. This demonstrates the enormous regulatory potential of winter oilseeds. Within the framework of the project, this potential was only clouded in specific plots affected by severe hailstorms in spring.

Sunflower: Being a summer crop, its cycle continued to develop favourably after the harvest of winter cereals. It benefited from the excellent water reserves accumulated in the deep soil profiles due to previous rainfall. However, the project's impact analysis identified a high carbon footprint in this crop due to the use of diesel fuel, which has motivated the priority introduction of strip-till techniques for the 2026 campaign

The determining factor of the growing season was the combination of abundant continuous rainfall and mild/warm temperatures, which led to an inverted performance to that usual in the territory: The northern areas (wetter and traditionally the most productive of the dry lands of Navarre) suffered from excess humidity, which reduced potential wheat yields.

This same rainfall regime greatly benefited the arid areas of the Middle and Southern Zone (Ribera), where crops such as barley reached productivity ceilings well above their historical average.

Wheat remained the main crop in Navarre fields for the third consecutive year, occupying 41% of the surface area compared to 36% for barley. This positioning was due to varietal improvements and better weed control

Overall, in the Autonomous Community, there was an increase in diversification and in the use of improving alternatives thanks to the rotation requirements of the CAP eco-regimes (requirement of 10% of improving crops with at least 5% legumes).

Implementation timeline and baseline

The incorporation of farmers into the project is divided in a staggered manner into three groups to measure the impact of regenerative practices:

2025 campaign (70% of farmers): First year of impact and implementation of the transition plan for 25 producers.

2026 campaign (remaining 30%): During the year 2025, implementing practices for 13 producers begins.

Baseline Setting: 90% of farmers (35 out of 38) set their baseline in 2025. The remaining 3 (ID 106, 107, 110) will establish it in 2026 due to their late discharge (November-December 2025).

In June and July 2025, an extensive soil analysis programme was conducted to diagnose the physical, chemical and biological health of the soil. 215 sampling points representing 4,897.8 effective hectares were analysed.

The distribution of the area in the project by region determines the location of the sample points. The VII-Ribera Baja region registered the highest control pressure with 77 sampling points (1,928 ha covered), followed by the VI-Ribera Alta and V-Navarra Media, both with 45 points each.

The soil sampling generated the following technical outputs:

- 442 carbon analyses (at depths of 10 cm and 30 cm) to calculate the organic carbon stock (\(SOC\) in t/ha)
- 221 Physicochemical analyses of complete fertility: macronutrients and micronutrients
- 36 complete microbiology analyses (PLFA profile)
- 36 background fertility reports
- 35 cover reports for optimising inputs.

The Evaluated Soil Health parameters are used to determine the multidimensional diagnosis of the plots in the project: It was structured in three critical control blocks:

- **Fertility and Physics: USDA Texture (3 fractions):** Moisture, Organic Matter, pH, Organic Carbon, C/N Ratio and Electrical Conductivity.
- **Nutrients (Macro and Micro):** Total Nitrogen, Phosphorus (Olsen), Potassium, Calcium, Magnesium, Sodium, Boron, Iron, Manganese, Copper, Zinc and Sulfur.
- **Biodiversity and Microbiology (PLFA):** Total microbial biomass, bacteria (Gram+/Gram), total fungi, mycorrhizae, saprophytes, actinomycetes, protozoa, fungus/bacteria ratio and general diversity index.

3. AGRONOMIC CONTEXT

The description of the agronomic context in the 2025 Impact Report of the Navarra 360° project is essential to establish a solid and objective baseline on which to interpret the effects of the regenerative practices implemented. This analysis allows us to characterise the initial conditions of the participating soils and production systems —including their territorial variability, their physical-chemical and biological properties, and the main conditioning factors for fertility and agronomic management—, providing the necessary framework to understand both the results obtained during the first year and the potential for improvement in future growing seasons.

This approach the agronomic context not only allows the project's impact indicators to be properly situated, but also to guide technical decision-making and prioritise those actions with the greatest capacity for improvement on soil health, efficiency in the use of inputs and the overall sustainability of the farms.

The project-wide soil results are summarised below:

N (kg/ha)	*Very High*	52,9	**pH**	*Basic*	8,11
P (mg/Kg sms)	*Very Low*	13,98	**Ca(mg/Kg sms)**	*Very High*	8.799,94
K (mg/Kg sms)	*High*	264,37	**CaCO3 (% sms)**	*Very Calcareous*	33,37
S (mg/Kg sms)	--	661,95	**Salinity (dS/m)**	*Non-limiting*	0,47

The soils of the project are generally fertile and with high levels of various nutrients, but they are marked by a strong alkalinity and a very calcareous character, which can limit the availability of phosphorus above all and forces the fertilisation strategy to be adjusted very well.

Soil has a double limitation for the availability of phosphorus: on the one hand, its natural endowment of assimilable phosphorus is already low; on the other hand, the high content of calcium and carbonates favours their chemical fixation, immobilising both the phosphorus present and that provided by fertilisation.

The direct agronomic consequences are as follows:

> Phosphorus is a highly reactive element. In the presence of a high calcium content and an alkaline pH sustained by calcium carbonate, soluble phosphorus (orthophosphate) undergoes a process called retrogradation. As a result, even if the farmer applies phosphorus to the soil, it is retained and unusable after a few hours or days. Phosphorus is the key element for cell division and energy supply (ATP), being essential during germination and rooting.

Generalised iron chlorosis is also an added technical problem: The very high calcium carbonate content ensures a strongly alkaline pH (7.8 - 8.5). This means that, in addition to the lack of phosphorus, the region will suffer endemic from iron chlorosis (iron blocking), which will limit photosynthesis and further weaken crops.

Although the general pattern is repeated throughout Navarre, there are some nuances between areas: In all regions there are very high levels of nitrogen, low or very low levels of phosphorus, basic pH, high calcium and calcareous or very calcareous soils

VI – Ribera Alta: it is the region with the highest values of nitrogen, potassium, sulphur, calcium and salinity. Even so, salinity is classified as slightly limiting, not a severe problem.

VII – Ribera Baja: it has high K values and the highest CaCO3 content, in addition to a slightly limiting salinity.

II – Pyrenees and III: Pamplona Basin: they have the highest pH, that is, the most alkaline soils of the whole.

V – Middle Navarre: shows the highest phosphorus among regions, although it is still classified as low, so it is still a potentially limiting nutrient.

Similarly, each crop in the scope of the project has its own needs and effects on the soil; When the soil characterisation data are analysed, the pattern is still similar to that observed by regions, but with some differences. Alkaline soils predominate in all crops, with a high presence of calcium and carbonates, and without significant risk of salinity.

Cross-referencing soil characteristics (high calcium, very high calcium carbonate and low phosphorus) with this mosaic of rainfed and rotational herbaceous crops (cereals, rapeseed and sunflower), helps to understand how soil chemistry interacts with the critical physiological needs of each crop.

Each of the species reacts very differently to a lack of phosphorus and an excess of limestone:

Malting Barley (Critical Sensitivity): Phosphorus is vital for grain development. A deficiency delays ripening and affects the size of the grain. This alters the malt extract and protein levels, causing the barley to be rejected by the brewing industry for not meeting quality standards.

The plots of the project, with malting barley in 2025, have higher values of nitrogen and potassium, the lowest phosphorus among the crops, and maintain a basic pH, high Ca and very high calcareous level and non-limiting salinity.

Wheat and Oats: These are winter cereals with a very high demand for phosphorus during tillering (when the plant defines the number of potential ears). Without assimilable phosphorus, the grain yield plummets from the beginning of the cycle.

The project plots with these crops show normal phosphorus levels, while it is potassium which appears as low. They retain the alkaline soil pattern, rich in calcium and very calcareous.

Rapeseed (High demand and paradox): Rapeseed is a cruciferous vegetable that is very demanding in phosphorus for the formation of biomass and oils. However, it has an advantage: its roots secrete potent organic acids that are capable of "breaking down" calcium phosphate by hatching phosphorus that was blocked. The analysis helps to measure this capacity for self-management.

The plots of the project with this crop are the same as in the previous case: they show normal phosphorus levels, while it is potassium that appears as low. They retain the alkaline soil pattern, rich in calcium and very calcareous.

Sunflower: It is the pivotal crop of the rotation. Its root is extremely deep and aggressive. It looks for phosphorus in layers of soil where cereals do not reach, but it is very sensitive to the calcareous crust (caliche) that can destroy the seedling at birth if the soil is compacted.

The plots of the project with this crop have the lowest level of nitrogen and somewhat lower values of calcium and calcium carbonate than other crops. Even so, it is still a basic, calcareous soil without significant salinity problems.

This analysis of the agronomic context in the project marks the following lines of action:

Avoid the "Thrown Money Effect" (Economic Efficiency). If farmers in the region apply the classic complex bottom fertiliser (such as traditional NPK) "*broadcast*" before sowing, 80% or 90% of the phosphorus provided will be blocked with calcium in a matter of days. The analysis is used to calculate the actual efficiency of fertilisation and change the strategy towards protected, localized or acidic fertilisers.

Design the Rotation Fertilization Strategy. Since you have crops that extract a lot of phosphorus (rapeseed) and others that suffer a lot from its absence (wheat/barley), the analysis is used to plan at what point in the crop rotation it is worth investing in phosphorus. For example, applying a strong dose of protected phosphorus to wheat and taking advantage of organic residues and oilseed rape's extraction capacity the following year.

4. MONITORING REGENERATIVE PRACTICES

Monitoring adopting regenerative practices in Navarra 360º has been structured taking the 2024 campaign as a baseline as a reference and considering only those practices that have been verified through field notebooks, CAP information and technical field visits. This approach has provided evidence for measuring how participating farms have changed and also for recognising practices that were already part of their management before the start of the project, such as no-tillage, minimum tillage, maintenance of crop residues on the surface, the inclusion of legumes in the rotation and, when it has been possible to verify it, the grazing of crops.

The 2025 results show an increase of the area where key practices for the regenerative transition are applied. Among the most relevant increases are no-till, which reaches 2,572 ha (+15%), minimum tillage, with 675 ha (+108%), surface tillage, with 556 ha (+199%), maintenance of residues on the surface, with 2,122 ha (+41%), and organic mulch, with 1,509 ha (+41%).

Significant progress has also been made in practices linked to integrated nutrient management, such as organic fertilisation, which has risen to 68 ha (+146%).

In addition, new practices will be incorporated by 2025, such as cover crops, companion crops, biofertilisation, the use of fertilisers with reduced nitrogen content, optimising irrigation water, the reduction of doses or passes of crop protection products and the diversification of crop rotation.

In terms of the transition to regenerative agriculture according to the SAI approach, these results reflect that a significant part of the participating farms do not start from a basic initial situation, but from an intermediate or advanced stage of adoption, equivalent in many cases to levels 2–3 (*Advancing-Leading*) of transition, as they already have soil disturbance reduction practices. improvement of coverage, diversified rotations and first advances in the reduction of inputs**. The project therefore not only accompanies farmers who initiate change, but also consolidates and scales practices already implemented, allowing progress towards higher levels of regenerative performance and generating a reliable basis for reporting impacts on input efficiency, biodiversity, emissions and soil health.**

For 2026, it is expected to deepen this transition by increasing the surface area with practices such as precision fertilisation, seeded fallow, maintenance of residues on the surface, minimum tillage and biofertilisation. The consolidation of these actions are expected to strengthen the progressive improvement of the project's indicators and move towards more efficient, resilient production systems aligned with the highest levels of performance defined by SAI for regenerative agriculture.

The gradual introduction of changes in crop management within the project area seeks to generate positive impacts on four key areas of the agricultural system: climate, soil health, biodiversity and water. In this context, **the regenerative practices promoted and verified in Navarra 360º do not act**

in isolation, but as a set of complementary strategies that progressively transform how the production system works.

Impact on soil health

The practices implemented help reinforce the protection and functionality of the soil.

The increase in organic mulch to 1,509 ha (+41%), living mulch to 617 ha (+7%) and maintaining plant residues on the surface to 2,122 ha (+41%) improves soil cover, protects it against erosion and helps to conserve moisture and moderate thermal oscillations.

In the same way, the expansion of minimum tillage and no-tillage favours the conservation of soil structure, aggregate stability and biological activity, by reducing the physical alteration of the profile.

However, the greater presence of legumes in the rotation (169 ha; +213%) and the advance of organic fertilisation and biofertilisation reinforce soil fertility and its biological functioning, by promoting more balanced cycles of nutrients and greater microbial activity.

Impact on biodiversity

The diversification of management observed in 2025 contributes to increasing the heterogeneity of the agroecosystem and generating more favourable conditions for functional biodiversity.

The introduction of cover crops (8 ha), companion crops (22 ha) and new crops in rotation (121 ha of rotation diversification), together with maintaining residues on the surface and living mulch, increases the availability of shelter and food for auxiliary fauna, soil organisms and other components of agricultural biodiversity.

In addition, implementing the practice of reducing doses or passes of crop protection products in 122 ha represents an important step in the reduction of chemical pressure on the agricultural ecosystem, favouring the conservation of natural enemies of pests, pollinators and soil macrofauna.

Impact on water

Practices aimed at reducing soil disturbance, keeping soil covered, and increasing soil content contribute to improved infiltration, moisture retention, and water use efficiency, while reducing runoff and the risk of nutrient leaching. In this line, the growth in surface area with direct seeding, minimum tillage, surface residues, mulching and organic fertilisation reinforces the soil's capacity to preserve water and cushion situations of water stress.

In addition, within the project, 5 Key Line designs have been made, aimed at improving the distribution of water in the plot, promoting its infiltration and reducing surface runoff. However,

this work could not be carried out in the field during the autumn, since the conditions were especially dry and the soil was not in a suitable state for its correct implementation.

Together, these actions show a clear line of work towards more efficient, resilient water management adapted to the conditions of each farm.

Climate impact (climate change mitigation)

The expansion of the area with direct seeding (+15%), minimum tillage (+108%), surface tillage (+199%) and maintenance of residues on the surface (+41%) contributes to reducing mechanical disturbance of the soil and favouring the conservation of organic carbon, strengthening the capacity of the agricultural system to act as a carbon sink. The lower intensity of tillage also implies reduced use of machinery and, therefore, in fuel consumption and associated emissions.

In addition, the growth in organic fertilisation (+146%) and introducing biofertilisation (135 ha) and fertilisers with reduced nitrogen content (145 ha) point towards a lower dependence on synthetic fertilisers, which can contribute to reducing both the emissions associated with their manufacture and those derived from their application in the field.

Overall, the changes observed in 2025 shows that adopting regenerative practices within the project not only represents a change in agronomic management, but also a progressive transformation of farm operations, with potential benefits for the environmental sustainability of the production system.

The increase in surface area in practices linked to the reduction of tillage, soil protection, improved fertilisation and diversification of the system constitutes a clear sign of progress towards more resilient, efficient production models aligned with the principles of regenerative agriculture

Strategic focus for 2026:

The transformative potential of regenerative agriculture does not lie only in the timely adoption of certain practices, but also in the continuity of technical support and the ability to consolidate, adapt and scale up these changes over time.

Here, the monitoring carried out during 2025 has helped to verify meaningful progress in adopting regenerative practices in the 38 participating farms, as well as to identify different starting points within the transition.

For 2026, the strategic challenge of the project is to strengthen this support to consolidate those farmers who are already in intermediate or advanced stages of transition, and to reduce the technical and economic uncertainty of those who initiate deeper changes in their management system

With this objective, the strategy for 2026 is aimed at maximising the impact of the project by concentrating advice on three priority axes: optimising fertilisation, minimising soil disturbance and reducing the use of crop protection products

These three areas have already shown progress during 2025, both for surface area and in introducing new practices and are particularly important levers of change due to their ability to generate simultaneous benefits on soil health, climate, biodiversity and water.

Fertilisation optimisation: This first strategic axis, focused on fertilisation optimisation, is based on a vision of the soil as a living and functional system, and is supported by tools such as soil analysis, individualised advice, the OptiN Fert model and field visits. Its consolidation in 2026 should support further progress in reducing the use of mineral fertilisers, improving agronomic efficiency without compromising yield. This approach can benefit the climate, by reducing the emissions associated with the manufacture and use of fertilisers – considering as a reference an average factor of 0.42 kg CO_2eq per kg of fertiliser produced – but also on water, by reducing the risk of nutrient leaching and diffuse pollution. Meanwhile, tighter fertilisation improves the economic efficiency of farms and strengthens their resilience to input cost volatility

Minimising soil disturbance: The second axis seeks to consolidate the positive evolution already observed in 2025 in practices such as no-tillage (2,572 ha; +15%), minimum tillage (675 ha; +108%), shallow tillage (556 ha; +199%) and maintenance of residues on the surface (2,122 ha; +41%). The continuity and expansion of these practices in 2026 are expected to strengthen soil structure, stabilise organic carbon, improve water infiltration and retention, and reduce susceptibility to erosion. It is, therefore, an axis with potential benefits for soil and water health, but also with a relevant contribution to the climate, due to its ability to promote carbon sequestration and reduce fuel consumption associated with intensive tillage. In addition, by better conserving soil structure and biological activity, these practices create more favourable conditions for soil biodiversity and long-term system functionality.

Reduction of the use of crop protection products: The third strategic axis focuses on reducing the use of crop protection products and accompanying farmers towards more preventive and selective integrated management models. During 2025, implementing this practice has already been verified in 122 ha, and its development in 2026 represents a key opportunity to increase the functional biodiversity of the agroecosystem, reduce chemical pressure on the environment and improve the ecological balance of the production system. The reduction of doses and passes of crop protection products can benefit biodiversity, by favouring the conservation of pollinators, auxiliary fauna and beneficial soil organisms, and on water, by reducing the risk of dragging or infiltration of compounds into surface and groundwater bodies. In addition, a lower need for treatments also implies fewer machinery passes and, therefore, an additional contribution to the reduction of emissions associated with the use of fuel.

Overall, the strategic focus for 2026 is based on accelerating the learning curve of participating farms and transforming the initial adoption of practices into a more robust, coherent and measurable transition.

Technical support will continue to be the main way to reduce the risk perceived by the farmer, facilitate decision-making and translate the principles of regenerative agriculture into tangible improvements on the four pillars of the project: soil health, biodiversity, water and climate.

This approach Navarra 360° not only seeks to continue improving its environmental indicators, but also to consolidate a more resilient, efficient and scalable production model, capable of generating agronomic, environmental and economic value in the medium and long term.

5. IMPACT RESULTS

Progress in 2025 provides an initial basis for linking adopting regenerative practices with the initial measured results of the Navarra 360° project.

The increase in area under practices such as no-tillage (2,572 ha; +15%), minimum tillage (675 ha; +108%), shallow tillage (556 ha; +199%), maintenance of residues on the surface (2,122 ha; +41%), organic fertilisation (68 ha; +146%), biofertilisation (135 ha) or the reduction of doses or passes of crop protection products (122 ha) provides a reliable basis for interpreting the changes observed in the agronomic and environmental indicators monitored in the project.

The impact generated by the project in 2025 is structured around three main pillars, which help explain the progress observed in soil, inputs and environmental performance.

Soil: The first pillar, focused on soil health and carbon sequestration, shows a favourable baseline in key parameters, with average values of organic matter of 2.4%, soil organic carbon (SOC) of 2.1% and carbon stock at 30 cm of 65.5 t C/ha, above the available regional references. Added to this is a functional biological basis, with a microbial biomass of 283.17 mg C/kg and a fungus-bacteria ratio of 1.14, although the microbial diversity index (1.28) continues to indicate considerable scope for improvement in the medium and long term.

Inputs: The second pillar, related to efficiency in the use of inputs, reflects significant progress in optimising fertilisation, especially in malting barley and wheat, where relevant reductions are recorded in the use of nitrogen per tonne produced (-44.98% and -46.65%, respectively), phosphorus (-74.66% and -63.34%) and potassium (-31.85% in malting barley and -76.73% in wheat). In parallel, the project has begun to incorporate measures aimed at more efficient water

management, with 206.28 ha of irrigated area (3.8% of the total), 7 ha under water/irrigation optimisation practices and the preparation of 6 Key Line designs, whose execution has been postponed to 2026 due to the autumn drought and the lack of adequate soil conditions.

Environmental performance: The third pillar, focused on crop and biodiversity protection and climate mitigation, also shows positive signs in this first year of impact. On the one hand, there are significant reductions in the EIQ per tonne produced, especially in sunflower (-77.9%) and malting barley (-39.6%), as well as in the kg of crop protection products per tonne, with decreases in malting barley (-44.2%) and wheat (-25.7%), while the diversification of management and the reduction of chemical pressure contribute to generating more favourable conditions for the functional biodiversity of the agroecosystem. However, the results show significant reductions in CO_2 equivalent emissions per tonne produced, especially in malting barley (-52.33%) and wheat (-49.65%), reflecting the combined effect of a lower intensity of input use, a more conservationist soil management and a general improvement in the efficiency of the production system.

BLOCK 1: SOIL HEALTH. Soil analysis

Soil health is one of the central axes of the Navarra 360° project and, therefore, during 2025 priority has been given to the generation of a solid baseline that will allow the measurable effect of implementing regenerative practices on the functioning of the production system to be measured in future years.

For this purpose, a targeted sampling programme was carried out that covered **215 sampling points** and **4,897.8 ha** of surface area, allowing a reliable starting point (Baseline) to be established for the main indicators linked to the physical, chemical and biological quality of the soil.

The baseline results show, at the overall level of the project, average values of **organic matter of 2.4%, soil organic carbon (SOC) of 2.1%** and a **carbon stock at 30 cm of 65.5 t C/ha**, the latter two being above the regional references available for Navarre. Biologically, the baseline reflects a **microbial biomass of 283.17 mg C/kg** and a **fungus-to-bacteria ratio of 1.14**, compatible with a biologically functional and balanced soil, while the **Shannon microbial diversity index** of **1.28** shows that there is still considerable scope for improvement for soil biodiversity.

These results should not only be interpreted as a snapshot of the current state of the project's soils, but as the starting point on which the impact of the regenerative transition will be evaluated in subsequent growing seasons.

In this context, the information generated allows not only to characterise the initial level of soil health in the participating farms, but also to direct the technical advice towards those practices with the greatest capacity for improvement on organic matter, sequestered carbon and biological activity. This

approach the project places the soil at the centre of its impact strategy, understanding that its progressive improvement is a necessary condition to simultaneously advance in productivity, agronomic resilience and environmental sustainability.

Building on this work, in 2026 the KeyBioCoop pilot will be launched aimed at testing methods that allow reducing the use of chemical fertilisers, introducing biostimulants and humic acids and the application of KeyLine designs in plots with marked topography, thus reinforcing the project's capacity to monitor this pillar in a more comprehensive way in the coming growing seasons.

BLOCK 2: FERTILISATION OPTIMISATION. Efficiency in the use of N, P, K

Nitrogen (N) usage efficiency

The indicator for this area is the kg of nitrogen provided per tonne of harvested product (kg N/t). This indicator measures the amount of nitrogen applied relative to crop production: a lower value generally indicates greater input efficiency, since the system needs a smaller amount of nitrogen to produce the same ton of crop.

The 2025 results show a substantial improvement in the efficiency of nitrogen use in the main cereals of the project, especially malting barley and wheat. In malting barley, the indicator drops from 35.52 to 19.54 kg N/t, a reduction of 44.98% compared to the baseline. In wheat, the improvement is very similar, with a decrease from 39.31 to 20.97 kg N/t, equivalent to a 46.65% reduction. These results show that the adjustment of fertilisation doses and the technical advice applied during the growing season have made it possible to significantly reduce the intensity of nitrogen use in these crops.

In oats, the performance is more moderate, with a slight improvement of 3.43%, going from 29.47 to 28.46 kg N/t. However, sunflower registers an increase in the indicator, which goes from 15.74 to 18.70 kg N/t, an increase of 18.80%. Although the absolute value is still relatively low compared to other more demanding crops, this result indicates that there is still room to optimise sunflower nitrogen fertilisation and better adjust it to the yield obtained.

The case of oilseed rape requires a specific interpretation. Globally, the indicator increases from 66.70 to 99.34 kg N/t, an increase of 48.93%. However, this result is conditioned by a loss of yield associated with a hail episode, which significantly reduced production and distorted the value of the KPI. Therefore, this increase should not be interpreted as an actual loss of agronomic efficiency, but as the effect of a specific climatic incidence on the harvested yield.

Results by agricultural region

Results vary across regions, although with a clearly positive trend in several of the main cereal areas of the project.

In the VII-**Ribera Baja** the best results are observed, with very sharp reductions in malting barley (-58.82%) and wheat (-62.14%). In the VI-**Ribera Alta** there are also significant improvements, with decreases of 45.80% in wheat, 37.18% in oats and 15.10% in malting barley. These data suggest that, in southern areas, adjusted fertilisation recommendations have had a particularly clear effect on the reduction of applied nitrogen per tonne produced.

The V-**Navarra Media** presents a particularly consistent performance, registering reductions in all crops with available data: malting barley (-5.34%), wheat (-28.47%), oats (-11.20%), rapeseed (-2.24%) and sunflower (-100%). This result suggests that, in that region, sunflower was produced without nitrogen inputs in 2025, which shows a high capacity to adjust management to the crop's actual needs.

In the IV-**Tierra Estella**, the performance is also mostly positive, with reductions in malting barley (-12.30%) and wheat (-31.27%), although oats show a slight increase (+8.06%).

The main deviations are concentrated in the northern regions. In the III-**Pamplona Basin**, in addition to the case of rapeseed (+178.46%, conditioned by hail), oats show an increase of 58.50%, while wheat shows a slight improvement of 9.43%. In the II-**Pyrenees**, the only two crops with available data show a worsening: oats increased by 28.39% and sunflower by 25.64%. These results suggest that, in these areas, the nitrogen fertilisation adjustment has not yet reached the same level of efficiency observed in the rest of the project.

Agronomic interpretation - Conclusions

Overall, the results of the first-year show that the project has been particularly effective in improving the efficiency of nitrogen use in wheat and malting barley, two of the most representative crops of the agricultural system analysed. The reductions observed, close to 45–47% globally, suggest that the technical adjustment of fertilisation can translate into substantial efficiency improvements from the first year of implementation. Thus, validating the potential of technical advice and adjusted fertilisation as key tools to improve agronomic efficiency

Meanwhile, the analysis shows that this KPI is sensitive to performance variability, and therefore to external factors such as weather incidents. The case of rapeseed clearly illustrates how a crop loss due to hail can lead to an apparent worsening of the indicator without worse nitrogen management. This aspect must be considered in the interpretation of the results and in the comparative analysis of future growing seasons.

In addition, oats and sunflowers show a more variable performance and, therefore, more scope for improvement. While oats respond positively in some regions, in others there are significant increases in the indicator, suggesting the need to continue adjusting fertilisation strategies to local conditions.

In the case of sunflower, the overall increase of 18.80% indicates that there is still room to improve crop efficiency, especially in those areas where the nitrogen applied has not translated into a proportional improvement in yield.

Across the regions, the greatest improvements are concentrated in Ribera Baja, Ribera Alta and Navarra Media, while the northern regions show a more irregular performance and will require more specific monitoring in future growing seasons.

Efficiency in the use of Phosphorus (P)

The indicator for this area is the kg of phosphorus provided per tonne of harvested product (kg P/t). It is an intensity KPI, so that the lower its value, the greater the technical efficiency of the system, since it allows a ton of harvest to be produced with a lower amount of phosphorus applied. The interpretation of this indicator is especially relevant in the context of the project, given that the initial agronomic characterisation shows soils with basic pH, high calcium content, very calcareous character and low or very low levels of available phosphorus, conditions that directly influence the availability and efficiency of use of this nutrient.

The results for 2025 show a very notable improvement in the efficiency of phosphorus use in the main cereals of the project, especially malting barley and wheat. In malting barley, the indicator goes from 7.91 to 2.01 kg P/t, a reduction of 74.66% compared to the baseline. In wheat, the decrease is also very pronounced, from 9.27 to 3.40 kg b/t, equivalent to an improvement of 63.34%. These results show a substantial reduction in the intensity of phosphorus use and reflect a clear improvement in the adjustment of phosphate fertilisation to the crop's actual needs.

In oats and rapeseed, the behavior is much more stable. Oats went from 10.37 to 11.17 kg P/t, representing a moderate increase of 7.65%, while rapeseed increased from 13.60 to 14.11 kg P/t, with a limited variation of 3.71%. These small differences reflect relative stability compared to changes in the main cereals.

The case of sunflower presents a differential behavior within the project, since it maintains a value of 0.00 kg P/t both at baseline and in 2025. This result suggests that no phosphorus contributions were recorded in this crop during the period analyzed and suggests that, in the agronomic conditions of the project, sunflower is being managed without specific phosphate fertilisation, predictably relying on the residual dynamics of the system.

Results by agricultural region

The territorial analysis confirms a clearly positive trend in several regions in the south and the middle zone, where the most significant reductions in the use of phosphorus per tonne produced are concentrated.

In the VII-Ribera Baja, malting barley reduced the indicator by 97.54%, from 1.26 to 0.03 kg P/t, while wheat improved by 72.55%, from 3.34 to 0.92 kg P/t. In the V-Navarra Media, malting barley reached a reduction of 100%, going from 8.99 to 0.00 kg P/t, and wheat improved by 83.54%, with a decrease from 9.67 to 1.59 kg P/t. In the IV-Tierra Estella, the most outstanding result corresponds to wheat, with a reduction of 96.13%, from 15.20 to 0.59 kg P/t, while malting barley also improves significantly (-43.77%).

These results suggest that, in a significant part of the project's farms, especially in the southern and middle regions, it has been possible to reduce the use of phosphorus very intensely without compromising production, which points to a better use of the existing reserves in the system and reduced use of bottom fertilisers that are not always justified from a technical point of view. This interpretation is especially relevant if one takes into account that the agronomic context of the project is characterised by low or very low levels of phosphorus at the time of sampling, combined with high calcium, calcium carbonate and basic pH, factors that strongly condition the availability of the nutrient for the crop.

In contrast to this general pattern of improvement, the main deviations are once again concentrated in the northern regions, especially in oats. In the III-Pamplona Basin, this crop goes from 2.38 to 10.19 kg b/t, an increase of 328.30%. In the II-Pyrenees, oats also worsened, with an increase of 46.95%, going from 13.09 to 19.24 kg P/t. These figures show that the improvement in phosphorus efficiency has not been homogeneous throughout the territory and that in certain combinations of region and crop there are still relevant inefficiencies that will have to be further analysed in subsequent campaigns.

In the VI-Ribera Alta, the performance is mostly positive, with reductions of 30.31% in malting barley, 42.65% in wheat and 36.48% in oats. However, in the V-Middle Navarre, although the performance of wheat and barley is very favourable, oats registered an increase of 44.44% and rapeseed of 17.17%, which shows that even within the regions with the best general trends there are still important differences according to crop.

Agronomic interpretation - Conclusions

The joint reading of these results with the agronomic context of the project allows us to draw a relevant conclusion: the improvement observed in wheat and malting barley shows that a significant part of the farms have been able to adjust the use of phosphorus much more precisely, significantly reducing the intensity of application in an environment where the availability of this nutrient is conditioned by alkaline and very calcareous soils. In this context, the results of 2025 validate a more

rational fertilisation strategy that is less dependent on systematic background applications, especially in those areas where the system has demonstrated the ability to sustain production with lower phosphorus inputs.

However, these intense declines must be interpreted with caution and monitoring in future growing seasons. In a context where available phosphorus is low and its dynamics are strongly conditioned by the calcium and carbonate content, the very marked reduction in inputs may be agronomically efficient in the short term, but it will require continuous monitoring to verify that it does not compromise the availability of the nutrient or the yield in subsequent years. From this perspective, the project not only demonstrates the ability to reduce the use of phosphorus, but also the need to accompany this reduction with a fine agronomic interpretation and continuous analytical monitoring.

Oats once again show the most irregular performance. The strong increases observed in the Pamplona Basin and in the Pyrenees indicate a lower correspondence between the phosphorus applied and the yield finally obtained, which points to a lower management efficiency in these specific conditions. Although the causes may be diverse and will require additional analysis, the results clearly indicate that this crop needs further technical adjustment in the northern areas to improve its performance within the project.

However, the performance of sunflower, with zero phosphorus values in all regions and in both years, confirms a clearly differentiated management pattern with respect to the rest of the crops. In terms of efficiency, this result indicates that the crop has been maintained without direct phosphate inputs and that, within the project, it has not generated additional demand for fertilisation of this nutrient.

The evolution described above is a clear sign that technical advice has contributed to optimising phosphate fertilisation, reducing dependence on systematic applications and favouring a more adjusted use of the nutrient. **Meanwhile**, the context of basic, highly calcareous soils with low available phosphorus highlights the importance of continuing to monitor these results to ensure that the reductions in intake maintain their agronomic sustainability in the medium term.

Overall, the results show a significant advance in efficiency, although they also underline the need to continue refining management by crop and by territory during the coming growing seasons.

Potassium (K) usage efficiency

The indicator for this area is the kg of potassium provided per tonne of harvested product (kg K/t). It is an intensity KPI, so the lower its value, the greater the technical efficiency of the system, since it allows the same ton of harvest to be produced with a smaller amount of potassium fertiliser applied. Its interpretation in the project is especially relevant because the initial agronomic characterisation shows,

at a global level, high levels of potassium in the soil, which suggests an important capacity of the system to sustain production with reduced or even no contributions of this nutrient

The 2025 results show that the intensity of potassium use was already very low at baseline, especially in major cereal crops.

In malting barley, the indicator goes from 0.12 to 0.08 kg K/t, a reduction of 31.85%. In wheat, the improvement is even more pronounced, with a decrease from 1.33 to 0.31 kg K/t, equivalent to a reduction of 76.73%. These results show that the project has contributed to further reducing already very moderate inputs, reinforcing a fertilisation strategy based on the better use of soil reserves.

In oats, rapeseed and sunflower, the indicator remains at 0.00 kg K/t both at baseline and in 2025. This performance shows that, in these crops, no potassium contributions were recorded during the period analysed and that the system has been able to sustain its production without resorting to mineral potassium fertilisation. In the context of the project, these values should be interpreted as a signal of high efficiency, consistent with the high availability of potassium described in the initial soil characterisation.

Results by agricultural region

The territorial analysis reinforces this reading.

In regions II-Pyrenees, III-Pamplona Basin, IV-Tierra Estella and V-Middle Navarre, the values of kg K/t remain at 0.00 in practically all the crops evaluated. In a context of soils with a good potassium endowment, this performance represents the most efficient scenario, since it indicates the absence of unnecessary mineral inputs and a complete use of the system's potassium fertility.

The VII-Ribera Baja shows a particularly outstanding improvement compared to the baseline. In malting barley, the indicator is reduced from 0.26 to 0.04 kg K/t, which represents an improvement of 83.34%. In wheat, the decrease is from 3.64 to 0.78 kg K/t, equivalent to a reduction of 78.48%. These results suggest that in this region a previous inertia of higher potassium supply has been corrected, moving towards a management much more adjusted to the real availability of the soil.

The only deviation from this general trend is observed in the VI-Ribera Alta, where malting barley goes from 0.00 to 0.33 kg K/t. Given that the starting value was zero, an impact percentage is not calculated, but this result represents an exception within the general performance of the project and suggests a specific application of potassium that does not follow the trend of reduction observed in the rest of the areas and crops.

Agronomic Interpretation - Conclusions

The joint reading of these results with the soil characterisation allows a clear conclusion to be drawn: the performance of potassium within the project validates a fertilisation strategy based on the use of the reserves already present in the soil. The fact that starting values were already very low, and that by 2025 they have been further reduced for wheat and barley, suggests that the system had scope to dispense with a significant part of potash applications without penalising production. In this context, the project has contributed to reinforcing a logic of "minimum inputs" where soil fertility could already sustain the crop

This result also acquires an additional strategic value if it is considered that the soils of the project have high levels of calcium and carbonates, factors that can influence the dynamics of cation exchange. Even so, the results observed show that the availability of potassium in the system has been sufficient to maintain very low or no fertilisation in most cases, which reinforces the idea that the soil reserves were capable of adequately supplying the crop during the growing season.

The performance of oats, rapeseed and sunflower, with continuous values of 0.00 kg K/t, can also be interpreted for the sustainability of the rotation system. In terms of efficiency, these crops have operated without direct potassium mineral inputs, which indicates a high capacity to exploit edaphic potassium within current management. Similarly, the very sharp reductions observed in Ribera Baja show that there was still room to correct inertia of overfertilisation in some specific areas.

This evolution has a positive reading both from an economic point of view, by reducing fertilisation costs, and from an agronomic perspective, by reinforcing a management more adjusted to the real fertility of the soil.

As the main aspect of future monitoring, it is advisable to keep the analytical monitoring of potassium available in subsequent campaigns, especially in those rotations with continuous extraction. Although the current results show a favourable situation, maintaining this low-replacement approach will have to be supported by periodic monitoring to confirm the agronomic sustainability of the system in the medium term

BLOCK 3: OPTIMIZATION OF CROP PROTECTION. Efficiency in the use of crop protection products and EIQ

The optimisation of crop protection has been evaluated using two complementary indicators: the kg of crop protection products per tonne produced, which measure the physical intensity of use of the product, and the EIQ per tonne (Environmental Impact Quotient), which integrates both the toxicity of the active ingredients and the dose applied and allows the environmental impact associated with phytosanitary management to be assessed. The joint reading of both indicators is especially relevant,

since a reduction in the amount of product used does not always imply, by itself, an equivalent reduction in environmental impact.

In global terms, the results for 2025 show a positive evolution in several of the project's main crops, with significant reductions in both the intensity of phytosanitary use and in the EIQ. The clearest advances are observed in malting barley and sunflower, while wheat shows a partial improvement and oats continue to show a less favourable performance. Overall, the data indicate that the project is succeeding in reducing phytosanitary pressure on a significant part of the farms, while improving the environmental quality of management in certain key crops.

Malting barley: One of the most favourable performances of the project is recorded, with a 39.6% reduction in the EIQ, going from 23.44 to 14.15, and a 44.2% decrease in kg of crop protection products per tonne, from 0.21 to 0.12 kg/t. This result shows a simultaneous improvement in both the amount of product applied and its environmental impact and suggests that optimising agronomic management and the nutritional status of the crop has contributed to reducing the need for chemical intervention. In this context, the evolution of malting barley is one of the most solid examples of integrated improvement within the project.

Wheat: The performance is more nuanced. Although the kg of crop protection products per tonne fell by 25.7%, from 0.15 to 0.11 kg/t, the EIQ showed a slight increase of 1.3%, from 19.52 to 19.78. This divergence shows that the reduction in the volume applied does not always automatically translate into a lower environmental burden and suggests that the protection strategy relied on active substances with a higher relative toxicological intensity. From a technical point of view, this result underlines the importance of continuing to advance not only in the reduction of quantities, but also in the selection of phytosanitary solutions with less environmental impact.

Oats: It is the main point of attention within this block. In 2025, the crop registers an increase of 35.0% in the EIQ, from 4.35 to 5.87, and an increase of 24.3% in the kg of crop protection products per tonne, from 0.15 to 0.19 kg/t. This performance is consistent with the greater instability also observed in other indicators of the project for this crop, especially in certain northern regions, and points to a lower degree of adjustment in management during the first campaign. Consequently, oats are configured as the crop that requires a more specific review in future growing seasons to improve the coherence between agronomic management, nutritional status and phytosanitary protection strategy.

Sunflower: It presents the most pronounced environmental improvement of the project, with a 77.9% reduction in the EIQ, going from 34.49 to 7.64, and a decrease of 15.6% in kg of crop protection products per tonne, from 1.05 to 0.89 kg/t. These results confirm a substantial reduction in the phytosanitary impact in a crop that, at baseline, started from high values of EIQ.

In combination with its low level of dependence on phosphate and potassium fertilisation, sunflower is emerging as one of the crops with the best environmental performance integrated within the project's rotation.

Rapeseed: The results should be interpreted with caution. Globally, the EIQ fell by 14.0%, from 16.11 to 13.86, while the kg of crop protection products per tonne increased slightly by 5.8%, from 0.26 to 0.27 kg/t. This apparent contradiction is caused by an anomalous reduction in yield on one of the farms affected by hail, which distorts the indicators calculated per tonne produced. Therefore, although the overall balance remains positive for EIQ, the performance of rapeseed in 2025 should be analysed considering the effect of this incident on aggregate results.

Overall, the results for 2025 allow us to conclude that the project is moving towards more efficient and environmentally adjusted crop protection, especially in malting barley and sunflower, where both the volume of product applied and the associated environmental impact are simultaneously reduced.

The case of wheat also introduces a relevant methodological reading: applying less product does not always equate to reducing the EIQ, so technical advice should continue to reinforce the choice of active ingredients and control strategies with a lower environmental footprint. However, oats and, to a lesser extent, rapeseed, highlight the need to continue refining management in certain production and climatic situations.

From a broader perspective, reducing chemical pressure on crops not only improves the efficiency of the system, but can also generate more favourable conditions for the functional biodiversity of the agroecosystem, by reducing the exposure of auxiliary fauna, pollinators and soil organisms to synthetic compounds. This approach optimising crop protection is consolidated as a strategic axis of the project, both for its direct contribution to agronomic sustainability and for its ability to reinforce other environmental objectives of the regenerative model.

BLOCK 4: WATER. Watering volume

Water management in Navarra 360° has been approached from a perspective of water efficiency and improvement of soil functionality, understanding that the capacity for infiltration, moisture retention and use of available water depends largely on the agronomic management applied on each farm. In this context, practices such as no-tillage, minimum tillage, maintenance of residues on the surface, mulching and organic fertilisation contribute to improving the structure of the soil and its ability to conserve water, while reducing runoff and evaporation losses.

In terms of direct monitoring, the irrigated area within the project is small, with 206.28 ha, which represents approximately 3.8% of the total area. Even so, during 2025, specific water/irrigation optimisation measures have begun to be incorporated in 7 ha, which is a first step towards a more precise management of water resources in those farms where water is a key agronomic factor.

In addition, in 2025, 6 Key Line designs were carried out, aimed at improving the distribution of water on the plot, promoting its infiltration and reducing surface runoff. However, its physical execution had to be postponed to 2026 due to the autumn drought and the hardness of the soil, which did not allow the work to be carried out in adequate conditions.

Overall, this block shows that, although the water dimension of the project still has a shorter development path than other areas, the foundations have already been laid to move towards more resilient management systems, capable of improving the use of water and reinforcing the adaptation of farms to situations of water stress.

BLOCK 5: BIODIVERSITY. Area dedicated to habitats and number of species cultivated

Biodiversity is one of the environmental pillars of the Navarra 360° project and, in this block, its evolution is mainly described through two specific indicators: the area dedicated to habitat within the farm and the number of species cultivated. However, the project's contribution to biodiversity needs to be interpreted more broadly, as the improvement observed in other areas also can benefit this pillar.

The reduction of phytosanitary pressure, reflected in improving indicators such as kg of crop protection products per tonne or the EIQ, contributes to generating more favourable conditions for auxiliary fauna, pollinators and other beneficial organisms of the agroecosystem. Similarly, some indicators of the soil health block, such as the Shannon Microbial Diversity Index, provide complementary information on the biological biodiversity of the soil system, by reflecting the functional diversity of the soil microbial community.

Building on this work, in 2026 a biodiversity pilot has been launched aimed at testing measurement methods that allow the evolution of key components such as auxiliary fauna, pollinators and other beneficial organisms of the agroecosystem to be monitored more accurately, thus strengthening the project's capacity to monitor this pillar more comprehensively in the coming growing seasons.

Unlike input use intensity indicators, in which the objective is reduction, in this case the progress of the project is interpreted based on the stabilization or increase of these metrics, as they are linked to

the ecological complexity of the production system and its capacity to sustain key ecosystem functions.

Area dedicated to habitat on the farm

Globally, the project maintains a practically stable habitat area between baseline and 2025, going from 405.26 ha (10%) to 402.03 ha (10%). This result reflects, in general terms, a capacity to conserve the space destined for biodiversity within the participating farms during the first year of monitoring. However, this reading should be interpreted taking into account that the calculation corresponds only to the group of farmers with a consolidated baseline in 2025, so the full scope of the indicator will be strengthened as the rest of the farms are incorporated into the comparative monitoring.

From the territorial point of view, the indicator shows a marked concentration in the south of the project. The VII-Ribera Baja concentrates practically the entire area of habitat registered in 2025, with 402.03 ha, equivalent to 21% of its area within the project. This high representation responds to the agro-environmental characteristics of the area, closely linked to areas of interest for steppe birdlife. In contrast, the VI-Ribera Alta goes from 9.43 ha (1%) at baseline to 0 ha in 2025. However, this result should not only be interpreted as a loss of ecological capacity, but also as a sign of opportunity: the advisory work carried out has helped to identify a clear margin for future growth in this region, especially through greater knowledge and use of agri-environmental instruments and eco-regimes linked to biodiversity.

When the indicator is analysed by type of crop, a notable modification in the distribution of the habitat area is observed. Fallow goes from 51.85 ha (8%) at baseline to 345.69 ha (56%) in 2025, while the area associated with malting barley decreases from 81.10 ha (41%) to 12.17 ha (6%), and that of wheat from 166.25 ha (12%) to 25.52 ha (2%). This evolution should not be interpreted as a reduction in the biodiversity of the system, but as a reflection of the dynamics of rainfed rotation and the weight of fallow land in certain areas of the project ("Year and time" Scheme). In this system, plots that in one season were occupied by cereals – and which could incorporate biodiversity strips or bird protection measures – go fallow in the following season, maintaining and even reinforcing in many cases their ecological functionality, especially when it comes to seeded fallow or linked to multi-annual agri-environmental commitments. In this context, part of the ecological value associated with the agricultural landscape shifts between seasons from sown to fallow areas, remaining within the system even if it changes location or agronomic typology.

Number of species farmed

The second indicator shows a positive, albeit moderate, performance. The average number of farmed species per farm goes from 3.4 at baseline to 3.5 in 2025, indicating progress in the diversification of production systems. This result is especially relevant because it not only reflects the alternation of cash crops in the rotation, but also the progressive incorporation of alternative species and, in certain cases, of practices associated with a greater complexity of the agricultural system.

The III-Pamplona Basin is the region that shows the clearest progress in this indicator, going from 5.3 to 6.0 species per farm. In the VII-Ribera Baja, the average value goes from 1.6 to 1.8 species, which also reflects a slight positive trend, although conditioned by a more specialised production model and by the agro-environmental particularities of the area. Taken together, these results suggest that the project is favouring a progressive diversification of rotations, with the potential to strengthen both the agronomic stability and the ecological functionality of the farms.

From an agronomic perspective, this increase in cultivated diversity is especially relevant in a context of soils with basic pH, high calcium and carbonate content and low levels of available phosphorus, since the introduction of species with different root architectures, cycles and absorption strategies contributes to a more diversified use of the soil profile and a better functionality of the system in the medium term. Although the indicator does not directly measure these processes, it does allow us to identify an evolution towards less simplified and potentially more resilient systems.

Overall, the 2025 results show that the project has been able to maintain a strong base of habitats within the agricultural landscape and to slightly increase the diversity of cultivated species, which is a positive sign for functional biodiversity. The stability of 10% of the area dedicated to habitat suggests that the system conserves a relevant fraction of space with ecological value, while the growth in the average number of cultivated species points to a gradual transition towards more diverse rotations that are better connected to the project's sustainability objectives.

In addition, the growth in the average number of cultivated species confirms a positive evolution towards more diversified systems, although there are still significant differences between regions and types of farms. In this context, technical support plays a key role not only in promoting new practices, but also in activating existing opportunities for eco-schemes, agri-environmental support and biodiversity planning at farm scale.

Meanwhile, this block must be interpreted in relation to other project outcomes that also have an impact on biodiversity. The reduction in phytosanitary pressure observed in several crops, as well as the progressive improvement of some biological parameters of the soil, reinforce the idea that

biodiversity in Navarre 360° does not depend only on the existence of habitats or crop diversification, but also on the reduction of chemical disturbances and the strengthening of soil biology.

In short, the first year of the project shows that biodiversity should not be understood only as a reserved area, but as an emerging property of the production system, linked both to the presence of habitats and to the diversification of crops, the reduction of phytosanitary pressure and improving soil biology. On this basis, the margin for improvement for 2026 and 2027 lies in the territorial expansion of these results and in their consolidation as a structural part of the regenerative transition of the project

BLOCK 6: CLIMATE. CO_2 equivalent emissions

The contribution of the Navarra 360° project to the climate pillar has been evaluated using the carbon footprint indicator expressed in tonnes of CO_2 equivalent per tonne of product (t CO_2eq/t). As it is a KPI indexed by production, its evolution depends on the balance between the inputs and agricultural work applied and the final yield obtained in each crop. This approach the indicator makes it possible to assess the climate impact of management in an integrated way, especially in relation to fertilisation, the use of machinery and the intensity of soil work.

At the overall level of the project, the 2025 results show a substantial reduction in the climate footprint of the main cereals. In malting barley, the indicator is reduced from 0.78 to 0.37 t CO_2eq/t, which represents an improvement of 52.33%. In wheat, the footprint goes from 0.65 to 0.33 t CO_2eq/t, equivalent to a reduction of 49.65%. In rapeseed there is also an improvement, going from 1.05 to 0.92 t CO_2eq/t (-12.56%). However, oats remain practically stable, with 0.41 t CO_2eq/t both at baseline and in 2025 (+0.06%), while sunflower worsens, going from 0.35 to 0.49 t CO_2eq/t, representing an increase of 41.78%.

These results are closely related to the evolution of other indicators of the project, especially with improving efficiency in the use of fertilisers. In malting barley, the sharp reduction in emissions coincides with a 44.98% decrease in nitrogen use intensity and 74.66% in phosphorus. In wheat, the reduction in the carbon footprint is accompanied by an improvement of 46.65% in nitrogen and 63.34% in phosphorus. This partnership confirms that fertiliser optimisation is one of the main climate mitigation levers of the project, especially considering that the manufacture of fertiliser contributes a substantial part of the system's emissions

Results by agricultural region

The territorial analysis shows that the greatest reductions in the climate footprint are concentrated in the southern regions, especially in Ribera Baja and Ribera Alta, where the main cereals present the

best results. In VII-Ribera Baja, malting barley reduces its footprint by more than 54% and wheat by around 64%, which confirms that in this region the combination of less use of fertilisers and improved management has had a particularly favourable climate impact. In VI-Ribera Alta, the trend is equally positive in several crops, with relevant reductions in winter cereals, consolidating this area as one of the most advanced of the project for mitigation per tonne produced.

In the V-Navarra Media there are also notable improvements. Wheat reduced its climatic footprint by 32.96%, while rapeseed improved by 36.00%, reflecting a favourable performance in a region where a good evolution in the efficiency of fertiliser use was also confirmed. This result reinforces the coherence between improving fertilisation and the reduction of emissions in this area of the project.

The main alerts are concentrated in the northern regions and in certain specific crops. In II-Pyrenees, oats increase their carbon footprint by 67.42%, while in the III-Pamplona Basin this same crop increases by 49.82%. These results point to a lower efficiency of the system in oats in the cooler areas of the project, in line with the less favourable performance also observed in other agronomic and crop protection indicators. In the Pamplona Basin, moreover, rapeseed shows an increase of 78.96%, clearly conditioned by the loss of yield associated with an episode of hail, which reduced the denominator of the indicator and artificially raised emissions per tonne produced.

Agronomic Interpretation - Conclusions

In malting barley, the overall reduction of 52.33% places this crop as one of the best examples of climate mitigation within the project. Its performance is particularly strong because it combines significant reductions in the intensity of nitrogen, phosphorus, phytosanitary and EIQ use, indicating an integrated improvement of the production system. From a climate point of view, malting barley shows that tighter fertilisation and lower input pressure can directly translate into a substantial reduction in emissions per tonne.

In wheat, the overall reduction of 49.65% confirms a very similar trend. It is a crop in which the improvement in nitrogen (-46.65%) and phosphorus (-63.34%) efficiency has almost directly resulted in a reduction in the climate footprint. Although at the phytosanitary level the EIQ remains practically stable (+1.3%), the reduction in the kg of crop protection products per tonne and, above all, the better adjustment of fertilisation explains the good climatic performance of the crop.

Rapeseed shows a more moderate overall improvement (-12.56%), but this result should be interpreted with caution due to the distortion caused by a hail accident. In fact, the territorial reading itself shows more favourable performance in regions not affected by this incidence, such as Navarre Media. Therefore, the aggregate result of rapeseed in 2025 reflects not only the effect of management, but also the strong influence that yield losses have on this KPI.

Oats show the most irregular performance, with stability at a global level but with very marked worsening in the northern regions. This pattern coincides with the inefficiencies observed in other

crop fertilisation and protection indicators, and suggests that, in this crop, the project has not yet achieved a sufficiently robust adaptation of management to the soil and climatic conditions of the cooler areas. From a climate point of view, this translates into a higher footprint per tonne where the yield does not match the level of inputs or intervention required.

The case of sunflower is especially relevant from an operational point of view. Despite presenting good results in other indicators, its global climate footprint worsens by 41.78%, from 0.35 to 0.49 t CO_2eq/t. The interpretation of the project associates this result with a higher intensity of tillage and diesel consumption, that is, a more disturbing soil management that penalizes the crop's footprint. This finding has helped to identify a clear point of improvement for the 2026 campaign, in which it is proposed to introduce practices of less disturbance, such as strip-till and direct seeding, to reducing the weight of mechanical work on the climate balance of the sunflower.

Overall, the results for 2025 allow us to conclude that the Navarra 360° project is already generating tangible climate benefits, especially in those crops where a more intense reduction in the use of fertilisers and a clear improvement in agronomic efficiency have been achieved. The results for malting barley and wheat strongly validate the project's approach, demonstrating that better input management can halve the carbon footprint per tonne produced.

Meanwhile, the analysis by crop and by region shows that the climatic dimension is strongly conditioned by the combination of technical management, territorial conditions and final yield. This explains both the very marked improvements observed in the southern zone and the deviations recorded in northern oats or sunflower. Precisely for this reason, the value of the first year lies not only in the positive results obtained, but also in the project's ability to accurately identify areas for improvement and guide future management decisions towards options with less climate impact

6. CONCLUSIONS

The balance of the first year of Navarra 360° allows us to conclude that the project has successfully moved from an initial phase of design and uptake to a phase of measurable impact, supported by a solid technical and agronomic base. In 2025, work was carried out with 38 farms and more than 5,300 ha, combining sampling campaigns, agronomic diagnostics, technical visits, transition plans and monitoring of practices to build a robust baseline and accompany adopting regenerative strategies in real farm conditions. The participation achieved and the fact that, in many cases, farmers incorporated their entire area into the project reflect not only the growing interest of the sector in

more sustainable and resilient models, but also the project's ability to generate trust through intensive and data-driven technical support.

One of the main lessons of 2025 is that the project does not start from a homogeneous situation or a context of "starting from scratch". A significant part of the farms already had transition practices, such as no-tillage, minimum tillage, maintenance of residues on the surface or certain diversified rotations, which explains why several soil and carbon indicators have a relatively favourable baseline from the beginning. In this context, Navarra 360° has not only promoted new adoptions, but has also contributed to consolidating, ordering and accelerating processes of change that were already underway, expanding the surface area under key practices such as direct seeding (2,572 ha; +15%), minimum tillage (675 ha; +108%), shallow tillage (556 ha; +199%) or maintaining residues on the surface (2,122 ha; +41%).

The agronomic context of the project helps to interpret these results more accurately. The soils analysed show consistently basic pH, high calcium content, high calcium carbonate and low levels of available phosphorus, together with high levels of potassium and nitrogen. This means that the main challenge of the system is to improve the efficiency and actual availability of nutrients in a chemical environment that limits their use, especially in the case of phosphorus. Precisely for this reason, the project has been right to place the soil at the centre of its strategy, relying on analyses, individualised diagnoses and recommendations for adjusted fertilisation, rather than on general fertilisation recipes.

The results show, in fact, that optimising fertilisation has been the clearest lever of impact in the first year. In malting barley and wheat, the two most representative crops of the system, there are substantial reductions in the intensity of fertiliser use: in nitrogen, of 44.98% and 46.65%, respectively; in phosphorus, 74.66% and 63.34%; and in potassium, 31.85% and 76.73%. These improvements show that a significant part of the farms had the ability to produce with significantly lower inputs, making better use of the fertility of the system and correcting inertias of application that were not always justified from an agronomic point of view. In addition, this improvement in efficiency not only has direct economic implications but also constitutes the main route of environmental and climate impact of the project.

The climate dimension confirms this reading. The carbon footprint per tonne produced is greatly reduced in the main cereals: -52.33% in malting barley and -49.65% in wheat, showing that the improvement in input efficiency, and especially the reduction in the use of nitrogen fertilisers, acts as one of the main mitigation levers within the production system. In this context, the project suggests that the regenerative transition does not operate only through long-term structural changes, but also through immediate and measurable agronomic decisions, such as fertiliser adjustment. Even so, the analysis has also made it possible to clearly identify some deviations, the most obvious being that of sunflower, whose climate footprint increased by 41.78% as a result of higher tillage intensity and diesel

consumption, which has led to a technical correction based on strip-till and direct seeding already being proposed for 2026.

In terms of soil health, the baseline obtained in 2025 is favourable for carbon and organic matter, with average values of 2.4% organic matter, 2.1% soil organic carbon and 65.5 t C/ha carbon stock, exceeding in the latter two cases the regional references used in the project. This confirms the potential of the system to sequester and conserve carbon, especially in farms with no-till management or organic farming. However, the biological reading qualifies this good starting point: although the microbial biomass stands at 283.17 mg C/kg and the fungus-bacteria ratio at 1.14, the Shannon diversity index, at 1.28, is still very low. The basic conclusion is that the soil already has a relevant structural and functional basis, but that full biological regeneration will require continuity, time and consolidation of current practices.

Another relevant conclusion of the first year is that the project's performance is not homogeneous either by territory or by crop. The greatest improvements are generally concentrated in Ribera Baja, Ribera Alta and, in some indicators, Middle Navarre, while the greatest irregularities are observed in the Pamplona Basin and the Pyrenees. In this context, oats appear to be the most unstable crop of the project, with less favourable results in several blocks of analysis – fertilisation, crop protection and climate – particularly in the northern regions. Similarly, the case of oilseed rape affected by hail shows that several of the KPIs expressed per tonne are particularly sensitive to yield losses, so that certain worsening's respond more to exogenous climatic factors than to poorer agronomic management. This methodological reading will be key to rigorously interpreting the results of the next campaigns.

In the block of crop protection, the report also leaves an important lesson: reducing the amount of product applied does not necessarily imply reducing the environmental impact of the phytosanitary strategy in the same proportion. This is observed, for example, in wheat, where the kg of crop protection products per tonne decreased by 25.7%, but the EIQ increased slightly by 1.3%, indicating a higher relative toxicological load of the active ingredients used. However, in malting barley and sunflower, simultaneous improvements are achieved in both the volume applied and the EIQ, showing that it is possible to move towards more efficient crop protection with a lower environmental footprint. This finding reinforces the need to continue deepening an advisory approach that not only seeks to "reduce quantities", but also to improve the environmental quality of phytosanitary decisions.

Biodiversity, on the other hand, must be interpreted more broadly than the mere indicator of habitat area. The project maintains approximately 10% of its area dedicated to habitat, with a very pronounced concentration in Ribera Baja, and slightly increases the average number of species cultivated per farm, from 3.4 to 3.5. However, the ecological value of the system is also influenced by other factors, such as the reduction of phytosanitary pressure, the dynamics of fallow in the "year and time" rotations and the progressive improvement of soil biology. For this reason, biodiversity in Navarre 360° must be understood as an emerging property of the production system, linked both to the structure of the

agricultural landscape and to the way crops, inputs and soil are managed. Along these lines, the start in 2026 of a specific biodiversity pilot to test methods for monitoring auxiliary fauna, pollinators and other beneficial organisms reinforces the idea that this pillar will gain precision and depth in the coming growing seasons.

Finally, although the water dimension of the project is still less mature than other blocks – with 206.28 ha of irrigated land, equivalent to 3.8% of the total area, and 7 ha with specific water optimisation measures – a clear strategy is already emerging in which water is addressed not only from irrigation, but also from irrigation. but also, from the functioning of the soil, infiltration and land planning. The realization of 6 Key Line designs, although they could not be executed in 2025 due to the autumn drought and poor soil conditions, shows that the project begins to integrate the water-soil-landscape dimension into its technical approach.

Overall, the 2025 report shows that Navarra 360° has managed to generate first tangible and measurable impacts in key areas such as fertilisation efficiency, climate footprint, soil health and crop protection optimisation. Meanwhile, he has clearly identified where the main challenges are still concentrated: the management of oats in the northern regions, the correction of sunflower management from the climatic point of view, the need to continue monitoring the availability of phosphorus in very calcareous soils, the consolidation of functional biodiversity and the deeper development of the water dimension. Beyond the concrete results, the main strategic conclusion of the first year is that the project has shown that the regenerative transition generates real impact when it is supported by quality agronomic diagnosis, individualized technical support and the ability to translate environmental objectives into practical management decisions

The cross-referencing of data shows that the Navarra 360° project is not an isolated laboratory initiative, but a real transition model fully integrated into the territory. In a year where Navarre demonstrated its great productive potential, the project proved that the same can be produced by halving the carbon footprint and protecting the community's most valuable resource against climate change: the health of its soils.

7. STRATEGY, SCALABILITY, AND POTENTIAL FOR 2026

Strategy for 2026

The technical strategy for 2026 should be based on three priority axes:

The first is the consolidation of **fertilisation optimisation**, which in 2025 has been the clearest lever of impact of the project, especially in wheat and malting barley. The reductions observed in the use of nitrogen, phosphorus and potassium, together with the fall in the climate footprint in these crops, suggest that the margin for improvement remains high if technical support, the interpretation of analyses and the adjustment of recommendations at the plot scale are maintained. In this area, 2026 should focus on deepening precision fertilisation, biofertilisation and the use of fertilisers with lower nitrogen content, while maintaining specific surveillance on the phosphorus available in highly calcareous soils, to prevent very intense reductions from compromising agronomic sustainability in the medium term.

The second axis should focus on the **minimization of soil disturbance** as a transversal impact strategy. The 2025 results show that the expansion of the area with direct seeding, minimum tillage, surface tillage and waste maintenance has been one of the most consistent advances of the project, and that these practices are directly related to improvements in soil health, water efficiency and climate mitigation. Therefore, in 2026 the project has the ability to consolidate this line of work by expanding the area under these managements and reinforcing its application also in crops where there is still a break in the regenerative logic, especially in sunflower. In this crop, the introduction of strip-till and no-till experiences represents an immediate strategic opportunity to reduce diesel consumption, correct the growth in emissions detected in 2025 and strengthen the coherence of the entire rotation from the climatic and soil point of view.

The third strategic axis for 2026 should be oriented towards the **protection of crops with lower chemical pressure and higher environmental quality** of management. The 2025 analysis has shown that the project is already capable of clearly reducing the use of crop protection products and the EIQ in crops such as malting barley and sunflower, but it has also shown that a reduction in the kilograms applied does not always imply a lower environmental burden, as reflected in the case of wheat. Therefore, the 2026 strategy should combine two objectives: to continue reducing the physical volume of product where possible and, at the same time, to move towards the selection of active ingredients and control strategies with a lower environmental impact. This reinforces the role of technical advice not only as a support for agronomic decision-making, but also as a tool for improving functional biodiversity and the overall sustainability of the system.

Project scalability

From a scalability perspective, the results of 2025 are particularly promising.

Firstly, because the project has already demonstrated the ability to intervene on a considerable scale – more than 5,300 ha and 38 farms – and has managed to translate this scale into an operational system of work based on sampling, diagnosis, advice, verification and monitoring of indicators. This means that the methodological basis is no longer experimental or punctual, but applied and functional, which facilitates its expansion in future growing seasons.

Secondly, the scalability of the project does not depend only on continuing to incorporate hectares, but also on the fact that the intervention model is replicable. The use of tools such as the spatial database, the Improvin platform, the OptiN Fert model, fertility reports and technical visits sets a work scheme that can be extended to new farmers, new areas or new regions while maintaining methodological coherence. The fact that a significant part of the positive results of 2025 has been concentrated in relatively transferable management decisions – such as fertilisation adjustment, reduction of tillage or maintenance of waste – reinforces the project's potential for expansion without the need to rely exclusively on complex structural investments.

Third, there is qualitative scalability, not just quantitative scalability. The 2025 analysis shows that the project already has sufficient evidence to evolve from a logic of implementation and accompaniment to a more mature logic of technical segmentation. In other words, 2026 may be the year in which Navarra 360° stops working only "on a project scale" and begins to work with more differentiated technical itineraries according to crop, region and level of transition of the farmer. This ability to customise is key to scaling with quality, especially in crops such as oats or in territories such as the Pamplona Basin and the Pyrenees, where the results show more variability and a greater need for local adjustment.

Potential for 2026

The potential for 2026 is high because the project has already pinpointed where the greatest agronomic and environmental returns lie. The most immediate potential lies in reinforcing the results already achieved in winter cereals, where the combination of adjusted fertilisation, lower phytosanitary pressure and soil management offers clear returns in economic efficiency, emission reduction and system stability. If these results are consolidated and extended to a greater proportion of farmers and areas, Navarra 360° can turn the one-off improvement of 2025 into a structural trend.

There is also significant potential in correcting the identified weaknesses. Sunflower appears as a clear operational opportunity to improve climate and soil through techniques of less disturbance. Oats, on the other hand, represent a substantial potential for technical improvement if fertilisation and crop protection can be better adapted to the conditions of the north. And the Ribera Alta offers a clear

window to expand the impact on biodiversity through a greater activation of agri-environmental aid and the area dedicated to habitat, taking advantage of the interest already aroused by technical support.

In addition, 2026 offers an opportunity for the maturation of the indicator system. The implementation of the biodiversity pilot, aimed at testing methods for monitoring auxiliary fauna, pollinators and other beneficial organisms, opens the door to a more comprehensive evaluation of the impact of the project, complementing the current indicators of habitat and crop diversity. Similarly, the execution of the planned Key Line designs and the finer water tracking will allow for a deeper development of a block that in 2025 is still lighter in weight. This means that the potential for 2026 is not only to "do more", but also to better measure and demonstrate the value generated by the regenerative transition

For 2026, the Navarra 360° project is in a position of clear consolidation and scaling. The results obtained in 2025 show that the combination of agronomic diagnosis, individualized technical advice and monitoring of indicators allows measurable impacts to be generated from the first year, especially in fertilisation, climate, soil health and crop protection.

On this basis, the strategy for the next campaign should be aimed at consolidating the improvements already observed in winter cereals, correcting the main deviations detected – especially in sunflower and oats – and expanding implementing regenerative practices with greater potential for environmental and agronomic returns.

Meanwhile, the project has a high potential for scalability, both for the replicability of its intervention model and for the possibility of fine-tuning its application according to region, crop and farmer transition level. In this context, 2026 represents a decisive opportunity to transform the first advances recorded into a trajectory of structural improvement, strengthening the resilience, sustainability and competitiveness of the participating farms.



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