

LEVERS FOR SUCCESS

TECHNICAL ASPECTS AND PROJECT DESIGN

- **Minimise impacts:** The owners decided to devote 10% of the Estate to trees rather than to vines or other crops. This compromise is beneficial for the adaptation of the vineyard to climate change and the creation of habitats favourable for beneficial organisms.
- **Anticipate the financial cost of maintenance:** Although the cost of planting is lower, tree maintenance costs are equivalent to approximately 5% of the farm's turnover, which had not been anticipated by the project leaders.
- **Embrace natural management:** No chemical fertiliser or pesticide is used, bats act as natural pest control. In-between the rows of vines, we have experimented natural grass cover to limit water runoff and soil erosion.
- **Be part of a long-term strategy:** François Frézouls emphasises that such a project «can only be the project of a lifetime.»

COMMITMENT OF STAKEHOLDERS

- **A community of volunteers and consumers:** The Estate welcomes woofers and works with a wide variety of stakeholders. Many visitors contribute to the project by bringing their own plants. The growing tourist attraction of the Estate enables to perpetuate the agroforestry project by increasing the sales of products.

ACTION MONITORING AND REPLICABILITY

- **Adaptive aspect:** The implementation of a regular monitoring and evaluation system supported by technical and academic experts ensures the project's ability to self-evaluate and adapt to changes and eventually improve its effectiveness.
- **Replicability:** This agroforestry project is reinforced each year by new cycles of planting. It can be transposed and replicated on other vineyards with similar issues, making sure to choose appropriate varieties.

FOR FURTHER INFORMATION

- Enclos de la Croix Estate webpage: <https://www.enclosdelacroix.com>
- Nature 2050 programme webpage: <https://www.cdc-biodiversite.fr/realisations/domaine-enclos-de-la-croix/>

PROJECT LEADERS

- **François and Agathe Frézouls**
ff@enclosdelacroix.com

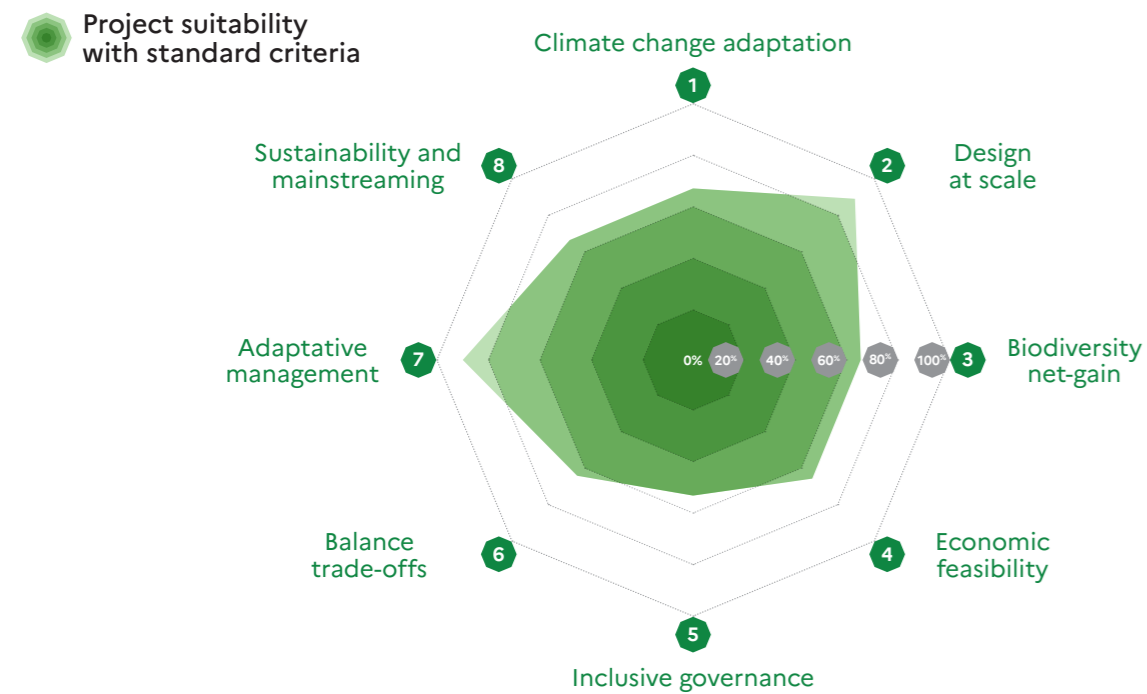
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ENCLOS DE LA CROIX ESTATE 2017 - 2050



Service trees planted at the Enclos de la Croix Estate, 2021
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IDENTITY CARD

GEOGRAPHICAL LOCATION

Lansargues, Hérault (34)

TARGETED ADAPTATION ISSUE(S)

Heat waves

HABITAT(S) CONCERNED

Rural

TYPE(S) OF NBAS

Sustainable management of ecosystems – Transition from vine growing to a vine-trees-grazing system.

PROJECT LEADER(S) AND ASSOCIATED PARTNER(S)

- Enclos de la Croix Estate
- Concours Arbres d'Avenir
- Accor Hotels
- Pur Projet
- Nature 2050 – CDC Biodiversité

FUNDERS AND BUDGET

- Nature 2050 Programme – CDC Biodiversité (31%)
- Occitanie Region (28%)
- Owner equity (31%)

Budget : 35 336 €

In addition, the cost of maintaining and monitoring the project until 2050 will be assumed by the Enclos de la Croix Estate and CDC Biodiversité.

PROJECT OBJECTIVES

- **For climate change adaptation**
Parcel the estate with trees to create a microclimate and limit the heat.
- **For biodiversity**
Create ecological continuity within the estate, with various habitats for the different target species (bats, pollinators, beneficial organisms for vines).
- **For the local area**
Improve the agri-environmental value of the local area in the continuity of existing protected areas, and bring together local partners around an emblematic regional production by stimulating wine tourism.



Alternating cork trees amidst vines, Domaine Enclos de la Croix, 2019
© CDC Biodiversité

CONTEXT AND ISSUES

The Domaine de l'Enclos de la Croix is a 23-hectare family-owned wine estate in the heart of the western Camargue close to the city of Montpellier. Its activity is based on three pillars: vines, trees and grazing. Rising temperatures are a major threat to the vineyard: the vines are affected by the heat while the risk of drought increases. As a result, the harvest has to be carried out earlier in the year, even before the grapes are ripe, or on the contrary later. This premature or delayed harvest affects the quality and yield. As a result, climate change could eventually threaten the sustainability of this wine estate. Monoculture was identified as a major source of imbalance and a factor weakening the resilience of the Estate to heat waves. Thus came about the idea of transforming these monocultures into 1- to 2-hectare enclosed areas surrounded by hedges in order to benefit from the many ecosystem services provided by the presence of trees.

REGULATORY CONTEXT OF THE PROJECT

- PCAET Pays de l'Or (updated in 2020)
- SCoT Pays de l'Or (updated in 2019)
- Natura 2000 Sites of l'Etang de l'Or, «Birds» and «Habitats» guidelines

ACTIONS IMPLEMENTED

In 2017, the Estate's agroforestry project won an award in the Arbres d'Avenir competition (organised by Accor, led by Pur Projet and co-financed by the Nature 2050 programme). Thanks to the grant received, 2300 trees and shrubs of 75 different varieties were planted on the property in the form of lines of forest trees and bushes inside the plots, interrow cultivation was experimented

following ancestral practices. The planting zones are marked and staked off; then the soil is prepared (de-compacting and subsoiling with a bucket shovel) for the plantings (setting up stakes and protections, mulching if necessary). The grassy areas are maintained by a hundred sheep from autumn to spring and a third of the estate is ploughed with horses.

SCHEDULE

PROJECT LIFESPAN

Background	1814: Creation of the Enclos de la Croix Estate 1992: Transition to organic farming 2009: Organic farming certification
2017	Project wins third Arbres d'Avenir competition Start of works: 358 trees planted Co-development of indicators
2018	Planting of 577 trees, shrubs and fruit bushes Start of monitoring
2019	Planting of 1365 seedlings
2020	Fund-seeking to continue planting and replanting Replanting of 98 vines Creation of an application listing all the trees planted
until 2050	Monitoring of indicators

GOVERNANCE ADOPTED

The design and implementation of the project were carried out by the owners of the Estate. In the long term, the management, maintenance and monitoring of the plantings are also taken care of by the owners of Enclos de la Croix. To implement the planting work, the Estate could rely on nine full-time employees along with the help of many volunteers. The Estate is also supported by CDC Biodiversité via the Nature 2050 programme for defining and monitoring the indicators until 2050, and its partner SAALTUS, mandated to carry out the technical monitoring. The Estate is also supported by Forêt Ressources Management to improve the carbon storage performance of the plants and the Tour du Valat research centre for ornithological monitoring. At the same time, Pur Projet ensures the follow-up of the winners of the Arbres d'Avenir competition for the first three years.

PROJECT BENEFITS AND CONTRIBUTIONS OF THE PROJECT



BENEFITS REGARDING TARGET ADAPTATION ISSUES

- **Temperature trends** : By dividing the estate into enclosed areas of 1 to 2 hectares with hedges, temperatures can be reduced by 3 to 5°C compared with areas directly exposed to the sun. Trees provide shade and coolness, enhancing the landscape and enriching the soil. The presence of trees also limits the water requirements of the vines by limiting evapotranspiration.



BENEFITS FOR BIODIVERSITY

- **Protection/preservation**: Integrated in the Etang de l'Or Natura 2000 site, The plantings of the Enclos de la Croix Estate ensure the preservation of a listed natural area.
- The creation of new habitats makes it possible to multiply the ecological continuity on the Estate, while favouring a great diversity of species.

OTHER BENEFITS

- **Economic viability**: Gradual transformation of the business model around the tree. This transition improves the quality and image of the wine, helping to increase the selling price of bottles. The agroforestry project costs the Domaine around 5% of its sales. It ensures the maintenance of a traditional, family-run business established 8 generations ago, as well as the preservation of natural landscapes in a rapidly expanding urban area that leaves little room for green spaces.



MONITORING INDICATORS

Adaptation to climate changes

- **Evolution/maturity of the ecosystem**: Measurements of the organic carbon stock in the soil and the natural abundance rate of Nitrogen 15 in the leaves
- **Carbon storage**: Monitoring and improving the carbon storage results of plants. Depending on the nature of the soils, the best adapted species are selected based on the determination of average biomasses by type of species according to growing milieu.

Biodiversity

- **Monitoring trees**: Census and mapping of planted trees (geo-referencing of each planting and exploitation of data through GIS software).
- **Annual monitoring of the birds** on the site.

Other

- **Project outreach**: Monitoring of number of visitors to the Estate



Field hedge planted in the vineyard, Domaine Enclos de la Croix, 2019
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