McDonald's Europe Flagship Farms

Lettuce – Florette Agrícola

Introduction

Florette Agrícola is the Spanish enterprise of the Florette Group, dedicated to growing and supplying fresh raw materials to Florette. The growing areas cover 1,400 hectares across northern and southern Spain and produce around 30,000 tonnes of produce annually. This includes Iceberg lettuce, Endives, Baby Leaf, Romaine, Batavia, Lollo, Spinach, Chard and Radicchio. Florette Agrícola currently supplies approximately 70% of the Florette Spain's annual fresh–cut raw material requirements.

The key initiatives undertaken by Florette can be summarised as follows:

- Automated drip irrigation is used to provide water to the growing crop and minimises water use by applying targeted quantities above the root zone of the crops. It is estimated to be 25% more efficient than other methods of surface irrigation.
- The use of nitrogen is closely monitored via soil sampling as well final product testing to ensure that application is optimised and cost effective
- Pheromone traps are used to capture and monitor incidence of pests so that Plant Protection Products (PPP) are only applied when defined threshold levels are exceeded. In addition, the use of biological pest control products with zero–residues, such as garlic extract, helps to further reduce pest incidence and minimise PPP use.
- Nest boxes and perches have been erected around the farm to provide more habitats for insectivores such as birds and bats. In addition to supporting local biodiversity, the animals act as a form of biological control against insects and rodents.
- Florette Agrícola employs a large number of workers on fixed–term contracts, and offers substantial assistance and support to all staff. The farm helps with issues such as the application of work permits, organising travel arrangements (from as far away as Thailand), and providing a support worker to help with any personal or financial matters.
- The company is a member of the region's Milagro XXI Foundation which provides help and support to the local community through projects and social development schemes.
- The farm works to promote best practice in the farming sector and encourage rural emloyment through engaging with local universities, employment forums and agricultural businesses.

> "The concept of sustainability is the foundation on which Florette Agrícola grows their crops. Their commitment to reducing inputs whilst maintaining product quality and productivity is a key element to their success and by ensuring that employees are content, both in work and during their own social time has enabled Florette Agrícola to maintain high employee retention rates. Retaining well trained and competent staff is crucial to the success of any business. The practices undertaken by Florette Agrícola demonstrate that the sustainability of lettuce production is not a one dimensional issue."
>
> **Karl Williams, Flagship Farms Programme Manager, FAI**

Summary of actions and benefits

The table below summarises the key areas of good practice displayed by Florette Agricola and the benefits (EN environmental / EC economic / ET ethical) that arise from taking these actions.

Action		Benefits
Assurance & Certification	**GlobalGAP Certification**	EC Has resonance with consumers and provides further market value EN GlobalGAP audits environmental criteria within its standards, which ensures the farming practices are not harmful to the environment ET GlobalGAP standards are designed to ensure that food quality, food safety and worker welfare is well managed
	Linking Environment And Farming (LEAF) Certification	EC Has resonance with consumers and provides further market value ET Promotes high standards of worker welfare and food safety EN Ensures best practice in environmental management
Water Management	**Lettuce varieties Drip Irrigation**	EN Estimated to be 15–25% more efficient than sprinkler irrigation EC Leaves are not directly watered, reducing risk of fungal disease and crop contamination EN Water is applied directly to the root zone ensuring efficient use of water resource and minimising soil surface run off. Lettuce varieties are adapted to the hot and dry climatic soil conditions of the region of Navarra
Ground Management	**Thermal Blankets & Ground Plastic**	EC Covering the plants and soil in cold or hot weather generates a microclimate for plant growth and reduces yield losses from frost and sun damage EN Covers reduce evaporation from the plant and soil, minimising water waste
	Pheromone–traps for caterpillars	EC Pheromone traps are inexpensive and easy to install and help monitor specific lettuce pests, this allows for targeted applications of PPPs once threshold levels are exceeded EN The traps reduce the need for blanket application of PPPs ensuring off–target species are not affected
Soil Health	**Nitrate Testing**	EC Since 2011 the optimal application of fertiliser has helped lower the application of chemical fertilisers by 21%, equivalent to a 24% decrease in input costs EN Nitrate levels in lettuce ensure quality is maintained, reducing waste
	Organic Fertiliser	EC Delivers nutrients to the soil and improves soil structure. Organic manures release nutrients more slowly than chemical fertilisers, reducing the need for frequent application EN Improved soil structure increases soil water–holding capacity and minimises soil erosion. Utilising manure helps to close the nutrient cycle
Environment	**Using biological repellents against pests**	EC Garlic extract and neem oil are used to control lettuce pests and protect the produce quality EN No residues associated with the use of biological controls EN Reduce the need for chemical fungicides and insecticides. Beneficial insects and mammals are not known to be affected by neem and garlic formulations, so local wildlife is not impacted
	Nest Boxes	EN Provides shelter for insectivores such as birds and bats, which act as natural predators against rodents and insects and protect the lettuce harvest, reducing the need for PPP use encouraging wildlife in the region helps boost biodiversity and habitat resilience
Staff Welfare	**Employment Contracts and Support**	EC Full–time fixed contracts encourage long–term employment and help enable the development of a skilled workforce ET Staff benefit from legal protection and support covering working conditions, finances, holidays and medical care, providing job security and protection to all employees on the farm

	Mentors	EC Provide support to employees throughout their working stay, building job satisfaction and worker happiness which improves employee and business performance ET Mentors provide social and financial advice helping to ensure good staff health, safety and wellbeing
	Worker Facilities	EC Full lodging and transportation around the farm during working hours is provided, increasing worker efficiency and support, encouraging better performance ET Provides a comfortable and communal environment for employees to relax and socialise ET Off–site transport is provided, offering staff independence from the work environment
Community Support	**Cañadas Reales Pathways**	ET The historical pathways used for driving livestock are protected and managed on the farm to ensure their use and historic value remains ET Maintaining the pathways is important to the cultural heritage of the area and continues to support the livelihoods of local shepherds and livestock keepers
	Member of Milagro XXI Foundation	ET The company supports local community projects and also participates in a number of regional festivities to celebrate the areas history in cultivation and culinary knowledge
	Supporting local business and Agronomical Schools	EC Collaborations with regional companies have led to technological developments in crop varieties, PPPs and novel cultivation techniques ET Florette Agrícola holds farm visits to support knowledge exchange and best practices within the farming and public sectors

“To be chosen by McDonald´s considering the crops of our subsidiary Florette Agrícola (Florette Agricultural Business unit) as part of the program “Flagship Farm” means the expressed recognition from one of our most important partners of the efforts made by our company in the field of sustainable development and our policy of ongoing improvement towards excellence.”

BU Ibérica

Background

The Florette Group is part of Agrial, which is an Agricultural Co–Operative. The business selects, prepares and sells ready–to–use salads and vegetables. Florette has 12 sites throughout Europe and employs a total of 2,700 staff, producing 1 million bags of finished product per day (equating to around 94,000 tonnes of product packed annually).

In Spain 75% of Florette's raw material requirement is sourced from their farming subsidiary Florette Agrícola (founded in 1998 by Florette Spain). Florette Agrícola farms (through contract farming agreements) around 1,600 hectares of land (73 hectares of greenhouses) across Northern and Southern Spain, and in 2011, produced 30,000 tonnes of raw material. The crops grown include Iceberg, Scaroles, Baby Leaves, Romaine, Batavia, Lollo, Spinach, Chard and Radicchio. Around 93% of Florette Agrícola's production goes to Florette with the remaining 7% supplied into the wholesale market.

The Castiflor farm is situated in the municipality of Olmillos, a small village near San Esteban de Gormaz (Soria Spain). The farm land sits at the edge of the town and the nearby Duero River supplies all the necessary irrigation water. In 2006, investment in the area led to new roads and a municipal reservoir and irrigation system, which provided the necessary infrastructure to improve the agricultural productivity of the area. This area has a continental climate, which is very cold in winter and warm in the summer. Due to the altitude (900m), it is an ideal area to grow salad crops due to the good daytime temperatures and cool evenings.

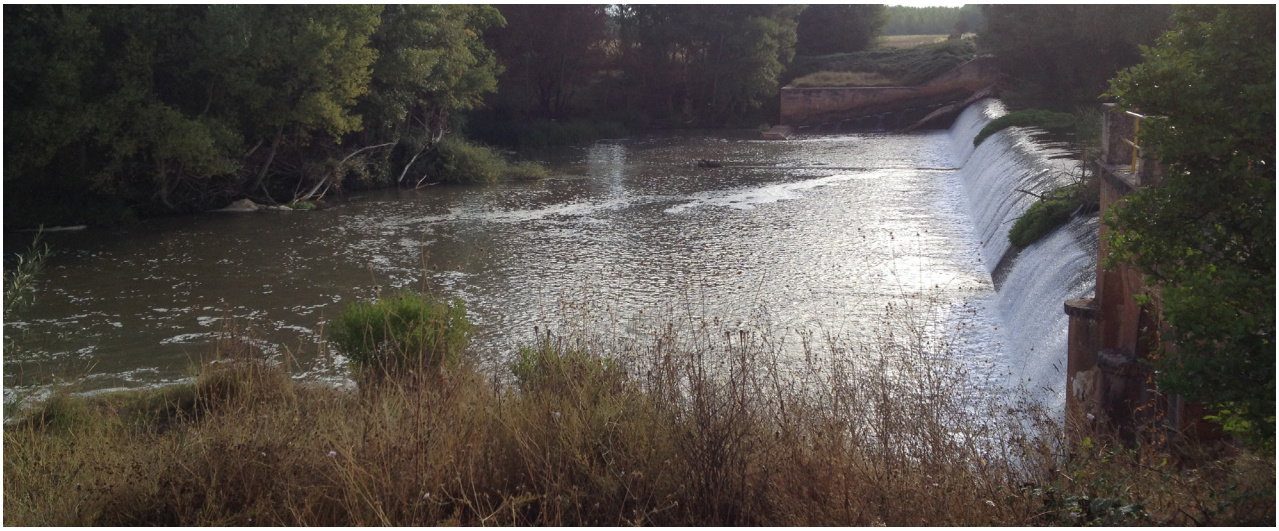
What is being grown on the farm?

Castiflor is one of the two cultivation sites used during the summer growing season. The climate and altitude limits our growing season here to the summer months between April and October. During this period the farm produces 6,765 tonnes of fresh salads on its 267 hectares of land.

During this period the farm produces a total of 6,765 tonnes of fresh salads on its 267 hectares of land, consisting of Iceberg, Curle Envive, Scarole, Romaine, Lollo and Radicchio.

Why is this area good for lettuce production?

The climate here is dry with low relative humidity which is good for lettuce cultivation. The soil is deep and fertile providing optimal conditions for good root development. As the lettuce plants are fragile the shelter provided by the trees is beneficial to plant quality. The municipality has invested in a good irrigation system here and the water quality is good and availability is excellent. We employ multiple techniques to reduce the impact of lettuce pests, these include crop rotation, pheromone traps, fencing and encouraging wildlife areas that support local predators, such as birds.



Where is the source of the irrigation water?

The farm's water supply comes from the Duero River, located near to the farm. The local municipality invested in a system of pumps and reservoirs to enable the viable production of crops and employment for the area. A pumping station pumps the water up to a large reservoir situated nearby, this then delivers the water under gravitational pressure to the fields. The water pressure in the field means we do not require energy intensive pumping systems on the field.

How do you irrigate the lettuce fields?

The farm ensures effective water management through the use of drip irrigation and automated sprinkler irrigation. The drip irrigation system uses a network of pressurised pipes and drippers that deliver the water to the soil directly above the plant's root zone.

We also use automated sprinkler irrigation in the first few days following planting to ensure plants have sufficient moisture around the root plug and during periods of high temperature to prevent tip burn.

What are the benefits of using drip irrigation?

The lettuce is particularly susceptible during the later growth stages between hearting and harvest when fluctuations in water supply can lead to losses in yield and crop quality. Drip irrigation directs water to the root zone of the lettuce, optimising efficiency of application and also reducing the impacts of run–off associated with topical irrigation systems.

In addition, avoiding water contact with the leaf of the plant can reduce the risk of fungal diseases developing on the dampened leaves and prevents any transfer of possible contaminants in the water to the edible leaves, preserving the crop quality.

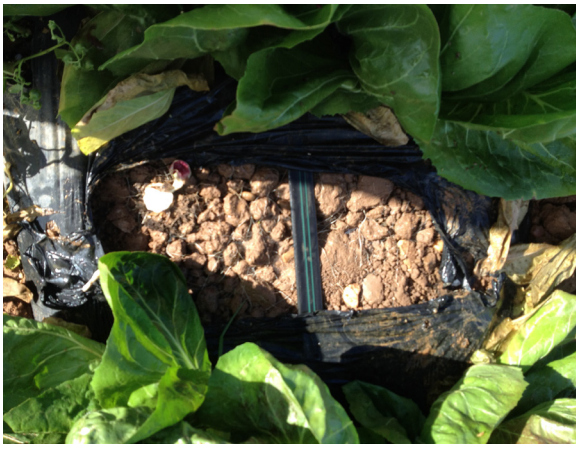
Have these water management tools reduced water consumption on the farm?

We aim to use water as efficiently as possible, the drip irrigation system allows for greater uniformity across the field and uses less water.

In 2012 there was an increased use of irrigation water because the summer was particularly dry so we had to apply more water than usual. Despite this fact, over a three year period we have reduced water consumption by 18%.

EN

Drip irrigation systems are estimated to be between 15–25% more efficient than sprinkler irrigation.



What other inputs are you trying to reduce?

EN

Achieved an 18% reduction in water consumption since 2011

Annual soil testing helps to reduce over–application of nitrogen which can lead to excess plant uptake impacting lettuce quality. Optimum nitrate levels are essential for lettuce quality, as insufficient or excessive levels can lead to soft leaf structure and bruising during picking and transport. Nitrate testing is performed regularly on both the soil and the harvested product to provide a detailed analysis of the soils nutrient status and the plants requirements. Where nitrogen is required, wherever possible it's applied in the form of pelleted organic fertiliser.

Why are you increasing the use of organic fertiliser?

We use a heat treated pellet which we can apply accurately to the soil and without the risk of creating any food safety issues. The pellets have the added benefit that they contain organic matter which helps improve many of the soil services. The organic manures also gradually release nutrients as opposed to chemical fertilisers; this reduces the need for frequent applications of fertiliser and lowers the risk of nitrogen leaching out of the soil.

What impact has this had?

By targeting the application of organic fertiliser, the farm has reduced its requirement and expenditures on chemical fertilisers. Since 2011 the farm has reduced the application of chemical fertilisers by 21%. In addition, utilising livestock manure helps close the nutrient cycle, and makes use of an existing resource.

How do you protect plants from temperature extremes throughout the growing season?

Thermal blankets and ground plastic are used to protect the lettuce plants in the early stages of growth. The thermal blankets are made of fabric cloth with a reflective aluminum foil woven through. When sealed over the plants in cooler weather they retain warmth, helping to support plant growth and reduce crop losses from frost damage.

In the warmer months, the reflective material shades the plants and maintains a cooler microclimate around the lettuce heads. Evaporation from the plants is also reduced, which helps to further maximise efficient water use and minimise water waste.

Ground plastic is used on the soil to create a similar effect. The black material absorbs energy from the sun generating warmth around roots of the plant, whilst the soil cover limits evaporation of soil moisture. Covering the soil in this way improves growth conditions in the soil and also helps to limit weed growth so that fewer herbicide applications are required.

EN

Achieved a 21% reduction in artificial Nitrogen applications between 2011 and 2013

Lettuce can be particularly susceptible to insect damage and disease, how are you controlling these problems?

Lettuce plants are affected by a number of crop pests, especially caterpillar species such as Heliothis (e.g. Helicoverpa armigera and Helicoverpa punctigera) and aphids (e.g. Nasonovia ribis–nigri). These can do considerable damage to the crop and many have developed resistance to traditional plant protection products used in lettuce production. The farm implements several practices to minimise the application of plant protection products (PPPs), such as pheromone traps and biological products such as garlic extract and neem oil.

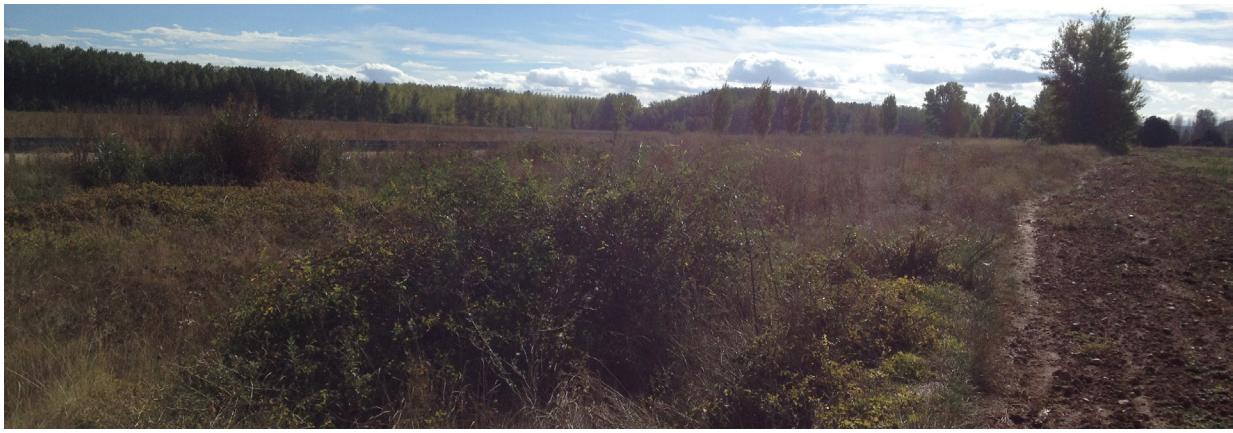
Also, depending on the climate conditions, sowing and planting operations are adapted to optimise growing conditions and reduce the impact of disease. For example, planting density is reduced in wet conditions to minimise the spread of disease from plant to plant. Drip irrigation also helps to reduce fungal diseases, as the plant leaves are not dampened, which can create an ideal environment for fungal growth.

How do the pheromone traps work?

EN

Pheromone traps allow us to monitor pest levels

Pheromone traps are used on the farm to identify insect pest species and enable targeted control. The traps use pheromones, natural signaling molecules produced by insects, to attract particular pest species. Small quantities of species–specific pheromone are emitted slowly from the device to attract the insect into the trap. The traps are inexpensive and easy to install and are used on the farm to successfully capture and monitor levels. The traps are placed at key positions in the field and checked twice weekly. If threshold levels are exceeded then a spray programme is implemented which is best suited to the type of pest identified. Monitoring in this way allows treatment to be targeted to the life stage and severity of insect activity in the field and ensures a responsible and defined approach to the application of PPPs.



What are biological products?

Biological products are natural substances such as garlic extract and neem oil, that can be used as an alternative to chemical insecticides and fungicides. Neem Oil repels a wide variety of pests including mealy bug, beet armyworm, aphids and it is not known to be harmful to mammals, birds or to beneficial insects such as honeybees and ladybirds. This is important as we rely on natural predators to help control pest populations and further limit interventions. Garlic extract has a reputation as both a prevention and cure and there seem to be few pest species immune to it's strong smell.

Have you been able to reduce chemical inputs as a result?

Increasing use of biological products has helped reduce the use of chemical inputs on the farm. In addition, high–precision application equipment and timing of treatment with good weather forecasts, has further helped to minimise superfluous applications and, as a result, total PPP application has reduced since 2011.

EN

We use garlic extract and neem oil as an alternative to chemical insecticides

How do you encourage biodiversity on the farm?

The farm encourages biodiversity through rural landscape preservation and using natural vegetation corridors and sheltered areas for local mountain wildlife, including partridge and deer. Nest boxes have been fixed to trees to provide shelter for insectivores such as birds and bats, and hangers for kestrels. These birds act as a form of biological control for insects and rodents which lowers the use of insecticides.

Florette Agricola is a member of LEAF (Linking Environment and Farming), how does this influence your farming practices?

The LEAF approach is centred on Integrated Farm Management (IFM) that utilises traditional farming methods alongside modern technology to improve sustainable farming practices. Members receive guidance and access to a number of management tools that work to enrich the surrounding environment, including enhancing local habitats, limiting use of chemical inputs, on farm recycling and water efficiency.

What other assurance certification does the business have?

In 2005, Florette Agrícola gained GlobalGAP approval, which is inspected and certified by an independent inspection body. This ensures that all practices from planting through to harvest are all carried out to high standards of quality and food safety. The scheme also aims to ensure that the environment is protected and to optimise the use of inputs. The scheme also ensures worker health and safety is protected.

EN

There has been a 100% increase in the use of biological controls along with a 30% reduction in PPP use

What benefit does the business receive from certification with GlobalGAP and LEAF?

GlobalG.A.P is an internationally recognized standard for growers and producers. Florette Agrícola produce is marketed as GlobalGAP approved which helps to increase brand integrity and product value through improved consumer confidence. The LEAF Marque logo has become synonymous with good quality produce grown to a high standard of environmental care. Certification with the LEAF Marque has helped further increase consumer trust and generate added market value for the Florette brand.

How many staff do you employ and where do they come from?

To ensure a stable and reliable staff, Florette Agrícola recruits globally. The current number of staff is 245 who come from 13 countries; many of these are from Thailand, Romania, Morocco and Spain.

Staff are employed on full–time fixed contract, they are provided with legal protection and support covering working conditions, finances, holidays and medical care. Work permits and the necessary documentation is provided in the employee's first language to ensure transparency and trust between the company and staff. The company strives to support this multicultural workforce at all stages throughout their employment.

What facilities are available for the farm staff?

Accommodation with all necessary amenities is available for the staff, along with communal facilities to allow staff to relax and socialize. Transport is provided to allow staff to go off–site offering independence from the work environment. Mentors are available to support employees throughout their working stay and they organise trips to amenities such as shops, banks and post office. They also arrange weekend trips and health care appointments when necessary. The company values the importance of family support and mentors will fully organise all staff holiday trips back home.

ET

Accommodation, communal facilities, transport and mentor support are provided for staff

ET

Improving training and better engagement with staff has improved retention rates

What benefits do you see from implementing these practices?

Staff retention was a significant problem for us in the past, it was also a significant cost, to train an employee and have them leave was a real challenge for the business. Now we have well–trained staff all around the year that are engaged in the business and work hard to produce a high quality product.

The region has a long agricultural heritage and traversing the farm is the Cañada Real. What is this and why is it important?

The Cañadas Reales is a historical pathway used traditionally for driving sheep to new areas and pastures. There are many Cañadas that form a network across 125,000 Km of the country and are protected from ownership or obstruction by Spanish law.

Florette Agrícola protects the use and management of the Cañadas Reales paths running through the farm, which are still being used today by traditional shepherds in the area to move goats, sheep and cattle to fresh grasing areas. Signposts erected by the company help to identify the paths to anyone working on or passing through the land to ensure their continued access.

Are there other ways the business supports the region's agricultural heritage within the local community?

Florette Agrícola engages with the local community to support knowledge exchange and best practices within the farming and public sectors. The company is a member of the Milagro XXI Foundation that supports local community projects and also participates in a number of regional festivities to celebrate the region's history. Florette Agrícola works closely with the local Agronomical Schools to promote the farming sector in the region and organises field trips to the farm which can be attended by local farmers, students and professionals.

ET

The company is a member of the Milagro XXI Foundation that supports local community projects

How do these events assist agricultural development in the region?

These events are important for knowledge transfer on best practice; this has resulted in a number of collaborations with regional companies looking to develop technological improvements in crop varieties, plant protection products and novel cultivation techniques.

Local residents and students from the University benefit from employment forums (Foro de Empleo de la Universidad Pública de Navarra and Encuentro Empleo–Sociedad) that publicise work opportunities.

What benefits does the business bring to the local community?

The large work force brings revenue opportunities to the area and the company has organised a number of offers with local companies to benefit the community and farm staff, including price offers on health services, amenities and travel (e.g. car hire, flights).

We also provide employment for the local community along with the opportunity for progression within the business to management roles.

We also rent land from local farmers, which is especially helpful to older farmers with small plots of land as they are able to retain ownership of the land whilst still receiving a rental income.

Appendix 1– Good Practice Matrix for Florette Agricola

The following matrix has been developed by McDonald's to help assess the sustainability of the agricultural production within the supply chain. Flagship farms have been identified that demonstrate best practice in one or more of the 17 key areas in the matrix, whilst also operating to general high agricultural standards in all other areas.

A ✓ in the matrix below indicates good practices demonstrated in this case study.

Ethical (acceptable practices) ET

Human health & welfare ✓
i Employee health & welfare ✓
ii Food safety

Animal health & welfare
i Nutrition
ii Medication & growth promoters
iii Genetic selection
iv Animal cloning
v Husbandry
vi Transport
vii Slaughter

Business ethics & supplier relationships ✓

Rural landscape preservation ✓

Environment (protecting the planet) EN

Climate change
i Greenhouse gas emissions
ii Energy efficiency ✓ & renewables

Natural resources – soil ✓
i Soil fertility & health ✓
ii Soil erosion, desertification & salinisation ✓
iii Soil contamination

Natural resources – water
i Water pollution ✓
ii Water usage efficiency

Natural resources – air
i Air emissions

Agrotechnology
i Agrochemical usage ✓
ii Bioconcentration & persistent organic pollutants
iii Genetically modified organisms

Ecosystem protection ✓
i High Conservation Value Land (HCVL) ✓
ii Habitat & species preservation ✓

Waste
i Production waste
ii Hazardous waste
iii Waste to landfill

Economics (long–term economic viability) EC

Sufficient high quality production ✓
i Producer income security & access to market ✓
ii Agricultural input costs ✓
iii Crop & livestock disease ✓

Community investment ✓
i Local employment & sourcing ✓
ii Support for community programmes