



WORLDWIDE  *fruit*

Water Stewardship Case Studies

Spanish Case Study 1:

Rio Cinca



cinca group



Water Stewardship Case Studies

Spanish Case Study 1: Rio Cinca

Contents

- 1. Context 2
 - 1.1 WWF Water Risk Filter: Physical Risks for Spain 2
- 2. Rio Cinca Summary 3
- 3. History of the Farm 4
- 4. Sustainable Water Management 5
- 5. Environmental & Other Initiatives 8
- 6. Climate Change & Water 10



Report compiled by Carina Wessels
Blue North Sustainability

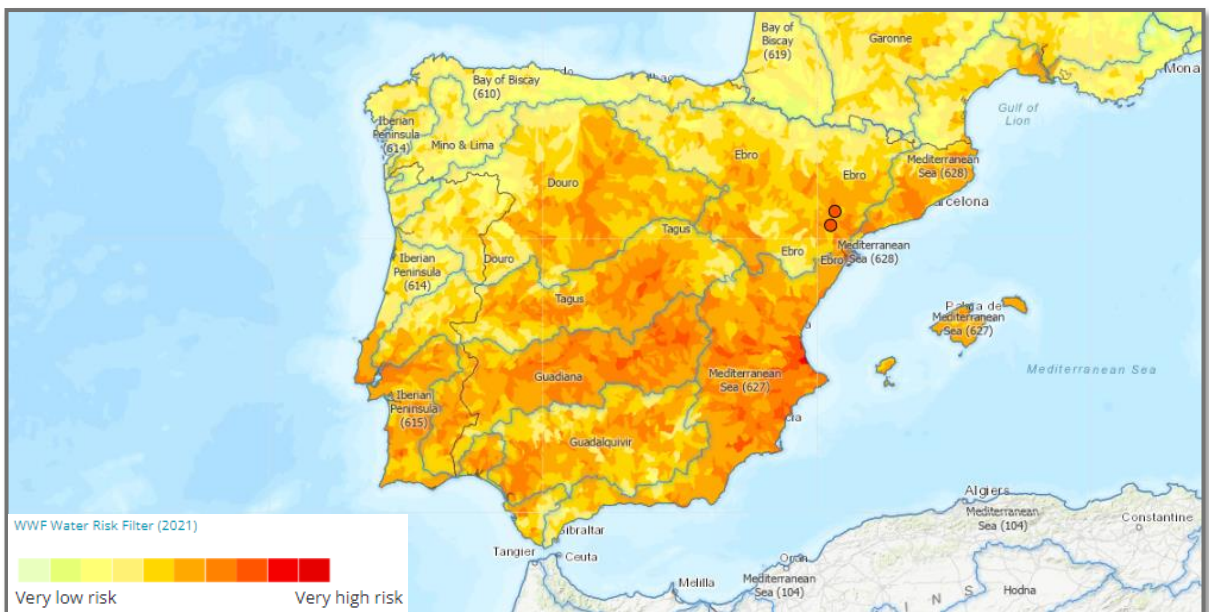
1. Context

Worldwide Fruit Limited (WFL) are investing in Water Stewardship across their supply base. As part of their commitment, they are presenting a series of Water Stewardship case studies from supplying farms. The aim of these case studies is to raise awareness of the challenges that WFL's growers deal with on a daily basis. Water management challenges and the solutions implemented to overcome them are explored, but we will also see how growers are driving ongoing good management of water resources. Apart from water, case studies will also look at current sustainability strategies implemented and plans for improving sustainability into the future.

This is the first Spanish Water Stewardship case study and represents Rio Cinca, based in the region of Catalunya and Aragón, northern Spain. Rio Cinca supplies WFL with stone fruit.

1.1 WWF Water Risk Filter: Physical Risks for Spain

The below image shows the WWF Water Risk Filter physical risk results for Spain, as well as Rio Cinca's location in the region of Catalunya and Aragón, northern Spain. The physical risk layer represents both natural and human-induced conditions of river basins. It is based on region specific data and comprises four risk categories covering different aspects of physical risks: water scarcity, flooding, water quality, and ecosystem services status. Therefore, physical risks consider if water is too little, too much, unfit for use, as well as the ecological health of surrounding ecosystems and associated ecosystem services.



Rio Cinca's location in the region of Catalunya and Aragón, northern Spain, is indicated with red dots. Major river basins are indicated with blue lines. Source: WWF Water Risk Filter

2. Rio Cinca Summary

Rio Cinca is based in northern Spain in the region of Catalunya and Aragón and is a family-owned business that has a wealth of knowledge and experience in the agricultural industry. The entrepreneurial character of Manuel Raventós Espona and his extensive experience in agriculture is at the foundation of what Rio Cinca is today. He bought the main family farm in 1952. In 1987, his son, Manuel Raventós Raventós, the current CEO of Rio Cinca, joined the business. Over the years he implemented new production systems and integrated innovative new technologies for the classification and commercialisation of fruit. Today, Rio Cinca consists of nine properties totalling over 2000 ha, producing 15000 tons of different varieties of fruit. Cherries and stone fruit comprise the main share of fruit production. As part of their sustainability drive, Rio Cinca has been adopting agricultural practices that improve soil health, reduce runoff losses, and increase infiltration and storage of water in the soil, for example, they make use of cover crops and composting. All their orchards are drip irrigated and they use humidity probes to measure soil moisture, which allow them to irrigate according to the needs of the soil. Rio Cinca is committed to the land, nature, and improving the environment around them. They have a land stewardship agreement with the conservation organisation SEO/BirdLife, as well as the TRENCA association, in order to protect nature and promote conservation of all types of birds. Even though the Catalunya and Aragón region in northern Spain is not as susceptible to climate change as the southern and western parts of Spain, Rio Cinca is still concerned about the effects of climate change on the future growth and sustainability of their business. The hope is that the interventions they have put in place will be enough to buffer them against the worst effects of climate change.



Rio Cinca supplies WFL with stone fruit. Photo: [Mercè Gost Parera](#) (CC BY-NC-ND 4.0)

3. History of the Farm

Rio Cinca, or the Cinca Group, is a family-owned business, built on a farm established in the early 1800's. The original farm was a gift from Spanish Royalty and consisted of around 5000 – 7000 hectares (ha). Since then, it has been subdivided and the main family farm is now approximately 1000 ha, of which 100 ha is under orchards and the balance farmed with arable crops.

The entrepreneurial character of Manuel Raventós Espona and his extensive experience in the agricultural sector is at the foundation of what Rio Cinca is today. His passion and enthusiasm to continue growing in the sector led him to buy the main family farm, called San Miguel, in 1952. San Miguel is located on the border of Catalunya and Aragón, and this is where Manuel Raventós Espona began his first projects of extensive agriculture and fruit tree plantations. In 1986 he acquired another farm in the Cinca river valley. This farm has a unique microclimate that allowed him to develop exceptional fruit plantations. Then, in 1987, his son, Manuel Raventós Raventós, the current CEO of Rio Cinca, joined the business and encouraged specialisation in the cultivation of cherries, which made them one of the pioneers of the cherry industry in Spain. He also implemented new production systems and integrated innovative new technologies for the classification and commercialisation of fruit.

The family purchased other farms in the Catalunya and Aragón region, which gave them a spread in geographic distribution, harvest timing, and different soil types, enabling a diversity of fruit characteristics. Today, Rio Cinca consists of nine properties totalling 2000 ha, producing 15000 tons of different varieties of fruit. Cherries and stone fruit comprise the main share of fruit production, and some other fruits, nuts, cereals and vines are also produced. Rio Cinca also owns a packhouse which is located on the earliest cherry farm, central to the other farms. 90% of the fruit they produce are packed there.



Manuel Raventós Raventós, current CEO of Rio Cinca. Photo: [Mercè Gost Parera](#) (CC BY-NC-ND 4.0)

4. Sustainable Water Management

Rio Cinca's water comes from a variety of sources. Some of the farms in the Group are supplied by rivers that feed into reservoirs. San Miguel (the main family farm) is supplied by a canal which was built in the early 1900's, called the Canal of Aragon and Catalonia. Water flows directly from the Pyrenees mountains into the canal and there is a system of reservoirs downstream from it. The Canal is 134 km long and provides water for over 130 users, irrigating more than 100 000 ha, and it is owned by the River Ebro's Water Agency, who allocates water to farms based on number of hectares.

Currently, the main limitation of irrigated agriculture in the Catalunya and Aragón region is the availability of water, both in terms of quality and quantity. From a water quality perspective, as water levels have been lowering in recent years, the salinity of water has been increasing. At the moment, the water is still used for irrigation; however, salinity is known to affect production in trees, crops, and pastures by interfering with nitrogen uptake, reducing growth and stopping plant reproduction. Irrigating crops with saline water can thus result in yield loss and decreased quality.



The upper Ebro reservoir, known as Mar de Aragon (sea of Aragon) for its size. One of Rio Cinca's farms pumps water from this point. The reservoir is currently at 40% capacity and the salinity of the water is rising. Photo: Rio Cinca

In terms of quantity, reservoir levels were very low in the Catalunya and Aragón region this year, this was however due to substandard management. The energy companies that generate hydroelectricity left reservoir levels much lower than they should have been at this time of year. The water system that comes down from the Pyrenees have got five reservoirs to capture and hold water and at several points various canals take water to different farming regions. About seven years ago, the community of farmers built another very large reservoir, much further down the drainage system, which they used as a backup reserve in case of drought conditions. This year was the first time that farmers had to extract from this backup reservoir.



Reservoir at San Miguel, the main family farm. The reservoir is low as it is topped up by the irrigation canal from the Pyrenees and towards the end of the year the canals are cut off to allow the reservoirs to fill up. Photo: Rio Cinca

To overcome some of the challenges mentioned above and be more sustainable in terms of water and in general, Rio Cinca has been adopting agricultural practices that improve soil health, reduce runoff losses, and increase infiltration and storage of water in the soil. For example, in the first three years of tree growth they leave grass to grow as an orchard floor cover. This helps to improve soil structure and also provides a habitat for beneficial insects. They also plant cover crops and apply compost to the soil. This has the potential to improve soil nutrient content, soil structure, water retention and cation exchange capacity, it can stabilise pH, and promote the natural cycles of nitrogen fixation, decomposition, as well as aid in the release of nutrients necessary for plant growth. Improving soil health leads to increased soil carbon sequestration that is important for the mitigation of climate change, decreased erosion rate, and to protect and enhance overall productivity of soils in the long term.

Some farms in the Catalunya and Aragón region (not affiliated with Rio Cinca) still make use of flood irrigation, especially smaller farms of less than 5 ha. For these small farms, installing an irrigation system and a reservoir does not make financial sense and it is easier to carry on with these traditional methods. Rio Cinca has completely moved away from flood irrigation – all orchards and vineyards now have drip irrigation installed. In the arable crop sections they use pivots and standing sprinklers.

In the past, Rio Cinca used aerial photography to check for differences in tree leaf density from above. This allowed them to see where there were more and less vigour in the orchard and pinpoint areas that were stressed. They would then adjust the irrigation schedule accordingly. This system was used for several years before they started using humidity probes to measure soil moisture, which now allow them to irrigate with greater precision according to actual soil moisture conditions.

Manuel Raventós Raventós (CEO of Rio Cinca) has rented the farm above the main family farm as this allows them to make use of gravity irrigation in certain areas of San Miguel, instead of using electricity for the pumping of water.

Rio Cinca does have some orchards under cover. This is mainly for hail and wind protection, however it does have the added benefit of reducing evapotranspiration of water by an estimated 20%. Currently about 40% of cherry orchards and 15% of stone fruit orchards are under cover.



Top: All of Rio Cinca's orchards are drip irrigated. Bottom left: Note the covers over orchards and cover crops within orchards. Photos: [Mercè Gost Parera](#) (CC BY-NC-ND 4.0). Bottom right: Covers are extended over the orchards during the summer months and reduce evapotranspiration by an estimated 20%. Photo: Rio Cinca

5. Environmental & Other Initiatives

Rio Cinca's focus is on delivering maximum production with minimum impact. Their aim is to take advantage of the symbiotic relationships between animals, plants, and soil life to augment their resources. They collaborate with the government of Aragon and other organisations such as conservation initiatives SEO/BirdLife (<https://www.birdlife.org/partners/spain-seo-birdlife/>) and TRENCA (<https://trenca.org/en/>), who advise them on enhancement of the environmental spaces on the farms in order to protect nature and promote the conservation of a variety of bird species.

At San Miguel, 8 ha of land next to the main irrigation holding dam have been flooded to create a wetland area. Rice was then planted in the constructed wetland in order to establish a feeding and nesting ground for various types of water birds that had disappeared from the region. For example, a flock of flamingos took up residence in the constructed wetland during autumn of 2013.



A flock of flamingos took up residence in 2013 in the constructed wetland at San Miguel. Photo: [Mercè Gost Parera](#) (CC BY-NC-ND 4.0)

Rio Cinca also started using a native bee strain for pollination, rather than the commonly used commercial bee strain. These native bees were found to be more adapted to the climate and able to work better in cooler conditions than the commercial bee strain.

About 6 years ago San Miguel experienced a rodent infestation. Rather than use artificial treatments like poison, owl boxes were installed around orchards and the rodent population was successfully brought under control.



Installing artificial nests for barn owls successfully brought rodent pests under control at San Miguel. Photo: [Mercè Gost Parera](#) (CC BY-NC-ND 4.0)

Rio Cinca has reduced the use of herbicides on all farms and are trialling organic production in a cherry block to see if this can be rolled out successfully across the conventional production. Currently, there is a significant move to organic farming in the western parts of Spain, in one of the oldest cherry growing regions, the Valle del Jerte. This is however implemented in a cooperative of thousands of growers with small farms (1 or 2 ha) on steep sides of valleys. It is much easier to implement organic production on small scale than over hundreds of hectares as is the case with Rio Cinca. The smaller farms afford managers greater control.

Manuel Raventós Raventós is committed to technological innovation in the agricultural sphere and has recently commissioned the installation of photovoltaic (PV) panels on the roof of the packhouse. The system currently produces 100 kilowatts, which guarantee the total consumption of the refrigeration chambers during the winter. They are preparing to expand the power to 350 kilowatts in future. Rio Cinca is also looking at solar for the farms, but they only use about two hours of energy per day for irrigation, and for hydro cooling and chilling of the fruit on farm, they use about three weeks of energy per year. Compared to the packhouse, which is used for 12 months a year, this will be a very large investment for the amount of energy they use on farm.



The installation of photovoltaic panels at Rio Cinca's packhouse. Photo: www.totlleida.cat

6. Climate Change & Water

The Catalunya and Aragón region in northern Spain benefits from the large water runoff from the Pyrenees mountains. The mountains also cause higher rainfall. The more western and southern areas of Spain are therefore more at risk from drought conditions due to climate change. That does not mean that Rio Cinca is not concerned about climate change. On the arable side of the business two crops are harvested each year – barley is grown in the winter, followed by a rotation of maize in the same fields. They are able to do that at the moment because they have enough water, however if climate change impacts water availability, double cropping will no longer be possible.

Rio Cinca has done a lot of work in the past to use water more sustainably, such as the aerial mapping and humidity probes. They have large reservoirs that should provide the buffer to get them through difficult times. The interventions they have put in place up to now position them to effectively mitigate and adapt to the worst effects of climate change.



To facilitate the conservation of water birds in the Cinca Valley, Rio Cinca has constructed an artificial wetland by flooding an area adjacent to the reservoir at San Miguel. Rice were planted in the wetland to provide a feeding ground for water birds. Photo: [Mercè Gost Parera](#) (CC BY-NC-ND 4.0)