



ON-FARM SUSTAINABILITY SUMMARY

SECTION 1 – HISTORY AND DESCRIPTION OF BUSINESS

Morrier Ranch, located at 6397 Mieras Road in Yakima, Washington, is a fifth-generation, family-owned hop farm. The ranch was founded in 1903 and has been producing abundant, first-rate hops ever since.

Hops have been an important crop in Washington State for over a century, with Yakima now producing more than 75% of the nation's hops. As one of the oldest continual producers of hops in our valley, we have observed trends and changes and have worked to evolve with them. One important change in the industry is the increasing importance of sustainable growing, and we have been eager to make our mark in sustainability.

As a fifth-generation farm, it can be tough to break practices developed over years of tending crops, but we have seen the advantages of sustainable growing and understand as the times have changed, so must our practices and goals. While we have never shied away from opportunities to become more sustainable and efficient, in recent years, sustainable growing has become one of our top priorities.

SECTION 2 – STORY OF STEWARDSHIP

Water Management

Our Drop Control soil moisture sensors by Wiseconn help us manage water use efficiently. According to Will Corsi, from Corsi Crop Consulting, regarding our moisture sensors, “Using this technology, we were able to more accurately determine crop water demand and irrigation depth needs.” This helps us eliminate excessive water usage. With the help of these soil moisture sensors, we can measure the water reaching the important sections of our root systems and monitor how much water is being retained. These sensors also keep track of our

usage over time so that we can look back and compare water usage year over year to document our progress.

Another update to our water management is the addition of the Twig MC irrigation system by Nelson Irrigation. This is the first year that we have used the Twig MC to help us water our hops, and it has drastically reduced the time and effort needed to irrigate. We can now precisely schedule our watering from employees' phones, allowing them to track how much water is expended at any time of day. Using these systems concurrently, we can schedule our irrigation and then check our sensors to ensure our hops are getting the exact amount of water needed, and no more.

Soil Health and Fertility

We have implemented several resources to sustain the health and fertility of our soil. For many years, we have employed rye cover crops to help manage erosion, fertility, and overall health of our soil. Our summers can be exceedingly hot and dry. Without our cover crops, rows would be dry, dusty, and prone to erosion. These crops also provide our hops with numerous nutrients that are important for growth, and they help to increase the water-holding capacity of the soil. We recycle the mulch recovered from our hops after harvest to fertilize the soil. We use this mulch in the spring, along with compost, for our baby hops.

Tony Roth has been our crop consultant at G.S. Long for many years. When asked how we manage our soil fertility, he said, "Fertility-wise, Morrier Ranch is using a well-rounded approach to soil health and sustainability with the use of alternative fertility materials to normal N-P-K applications. Drip irrigation and soil moisture monitoring has aided in our approach. Hops are a huge consumer of nitrogen, and we sample three times a year for nitrates within the hop plants. This allows us the opportunity to decide weekly on usage amounts without over-usage."

Integrated Pest Management (IPM)

We are currently pursuing certification from Salmon Safe. Salmon Safe is an organization that monitors the pest control products we use to ensure they are sustainable for our use and safe for the salmon that share our water ways. Tony Roth, our G.S. Long crop consultant, helps us manage our pest control spray use. "I have worked alongside Morrier Ranch's management team since 2004," Tony said. "As agriculture has evolved and the need for better IPM strategies have come into play, Morrier Ranch has listened to and implemented many of these ideas. From adding beneficial insects, protecting the natural beneficials we do have, and trying alternative chemistries for mite control, they have been more than willing to try alternative programs."

To aid in our IPM strategy, have also planted two fields with certified, virus-free plants to ensure healthier, more sustainable crops in the future.

Energy Efficiency

When it comes to energy efficiency at Morrier Ranch, we have implemented numerous tools to make our ranch more environmentally friendly. We have installed LED lights, which are more energy efficient than typical bulbs. We also use both natural gas and propane for our energy. Natural gas is the cleanest form of fossil fuel and a highly efficient form of energy. It produces fewer chemicals than fuels like coal or oil. Propane is one of the fuels that makes up natural gas and also has many benefits over traditional fossil fuels. It is not considered a greenhouse gas in its natural state and is not toxic or damaging.

SECTION 3 –SOCIAL AND ECONOMIC PILLARS

All progress we have made to become more sustainable and efficient has been recognized by our GlobalG.A.P. Certification. GlobalG.A.P. is a food safety certification, which means we have third-party experts evaluate and verify our farm yearly to ensure we remain safe and sustainable in our daily activities. From chemical use to water management, we are vetted thoroughly to meet global standards. We are currently in our third year of GlobalG.A.P. certification and work hard every day to meet their needs.

We have hosted community engagement events to inform growers in our community about how they can work to become more sustainable. We collaborated with Hop Growers of America on a two-day workshop at our ranch with the purpose of educating some of our fellow growers about our GlobalG.A.P. certification and some of the changes we have recently made to become more sustainable.

We hold monthly safety meetings for our employees. In these meetings, we discuss a range of topics including requirements for treating hops as food products, appropriate conduct when in the fields, and procedures during emergency situations. In the words of our senior owner, Joe Morrier, “In the last few years, we have made tremendous changes regarding our soil, irrigation, and chemical management to become a more sustainable farming operation and environmental steward. I am extremely proud of all of our employees for embracing these best practices for the future of our farm and for our Central Washington farming community.”