

# CLEAN PRODUCTION: NIAGARA MALT

A CASE STUDY TO ASSESS AND REDUCE WASTE PRODUCTION

## SUMMARY

Niagara Malt is a craft malt house and small farm located in Cambria, NY. As a member of the Western New York Sustainable Business Roundtable (SBR), Niagara Malt has had a commitment to sustainability since its establishment in 2013. In 2020, Niagara Malt joined a program run by the WNY SBR, and funded by an EPA Source Reduction Grant, called the Clean Production Leaders. The objective of this program was to assess a company's footprint (carbon, chemical, water, energy, etc.) and work to reduce it. By participating in Clean Production Action's Chemical Footprint Survey, Niagara Malt was able to assess their chemical footprint. As a result, Niagara Malt has been working to reduce their footprint in five key ways: energy, hazardous materials, water, nonhazardous waste, and dollars spent. Niagara Malt has successfully become carbon negative, certified USDA organic, reduced 6000 gallons of water used, diverted 2000 lbs of solid waste from landfills, and has reduced energy costs by \$5980 to date.

## COMPANY

*Producing heritage fruits, small grains and craft malt in Cambria, NY.*

Established in 2013, Niagara Malt LLC currently grows heritage fruits, specialty grains and operates a craft malthouse in Cambria, NY. Niagara Malt has 2 employees and reported approximately \$80,000 of sales in 2020. Niagara Malt produces malted grains (barley, wheat, rye and others) which are sold to New York craft brewers and distilleries. Based at Cambria Vines N' Bines, Niagara Malt's operations includes a 15-acre field, a small orchard and a 2900 sq ft malt house, where the grain cleaning and malting occurs. Niagara Malt is certified USDA organic by NOFA-NY and a member of the Western New York Sustainable Business Roundtable.



**Figure 1. Buckwheat field in Cambria, NY in full-bloom providing ground cover and nectar resources for pollinators.**

## OBJECTIVES

*Reducing energy demand, waste production, and chemical usage.*

Malting is an energy intensive process which uses water, produces carbon dioxide emissions, creates waste, and utilizing chemicals in cleaning and sanitation. As a result, Niagara Malt is actively working to reduce energy demand and emissions, reduce waste and water usage, and reduce unnatural chemical usage.



**Figure 2. contains germinating barley malt from Niagara Malt.**



# ANALYSIS & RESULTS

## Energy

By combining a wood pellet gasification boiler hydronic process heating system, which uses waste hardwood sawdust pellets as fuel, and a 14.7 kW rooftop solar system (Figure 3), Niagara Malt has reduced their carbon dioxide emissions by 15,161.6lbs (6.9 metric tons). The combination of the wood pellet heating system and the rooftop solar system has made Niagara Malt carbon-negative.



**Figure 3. showcases Niagara Malt's 1700 ft<sup>2</sup> malt house which has a 14.7 kW rooftop solar system.**

## Hazardous Materials

Because Niagara Malt is USDA certified organic, they have been working to reduce toxic chemicals and sanitizing agents for their grains and machines. All of Niagara Malt's growers follow strict organic practices that limit synthetic pesticide and fertilizer application and promote soil health, crop rotation and cover cropping. In malt production and cleaning, approximately 12 lbs of caustic sanitizing liquids have been replaced by plant-based cleaning agents and a peroxide-acetic acid Organic Materials Review Institute (OMRI) approved sanitizer. Niagara Malt has malted approximately 25 tons of organic grain to date, from approximately 80 acres cultivated by their grower, which reduced fertilizer application by an estimated 800 lbs and avoided the recommended fungicide application of an estimated 225 gallons.

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## Water

Malting requires multiple steepings of approximately 600-700 gallons of water, per steep, to fully hydrate the grain. Niagara Malt monitors steep water levels to minimize the volume of water used while achieving proper grain water content. These monitoring efforts have saved Niagara Malt an approximated 6000 gallons of water.

## Non-hazardous Waste

Niagara Malt has implemented a polywoven supertote (FIBC) recovery/reuse protocol that is approved by the Northeast Organic Farming Association of New York (NOFA-NY). Reuse has allowed for diversion of approximately 160lbs of woven polypropylene fabric from landfills. Additionally, cleaning dry malt produces approximately 100 lbs of waste malt dust and pulverized rootlets. This biowaste is captured and because it is high in protein and complex carbohydrates, it is given to a local hog farmer who uses it as a feed supplement. This relationship has helped Niagara Malt divert 2000lbs of waste from the landfill.

## Dollars Saved

Since integration of the boiler and solar systems, Niagara Malt's power bill has dropped from \$620.00 per month to \$22 per month (connection fee). Niagara Malt also has a 5840 kWh credit with National Grid that we will tap during lower generation winter months. Reduced power cost savings YTD are \$5,980.

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