



## 2021 ASBC Research Council Grantee

**Principle Investigator Name:** Jessica Prenni

**Academic Institution:** Colorado State University

**Project Title:** *Evaluation of the impact of wildland fire on hops: development of an analytical method to detect volatile phenol contamination*

### Project Intro:

The Pacific Northwest (PNW) contains 99% of all hops acreage in the US and accounts for approximately 25% of worldwide hops acreage.<sup>1</sup> In 2019, the PNW produced over 56,000 tons of hops with an economic impact of approximately \$637 million.<sup>2</sup> In 2020, hops acreage in the PNW increased 4.65% from the previous year to a total of 59,174 acres.<sup>3</sup> At the same time, wildfire events have become common in this region, with the Northern California and the PNW experiencing a combined 8,538 wildland fire situations that burned ~ 4.8 million acres in 2020 alone.<sup>4</sup> These events have raised concern in the brewing industry about the impact on the quality of hops exposed to wildfire. In the wine industry, several studies on the effects of smoke-exposed grapes (pre-and post-harvest) have shown detectible levels of volatile phenols (VPs) characteristic of smoke-taint, both in berries and wine.<sup>5, 6</sup> However, there is a notable lack of research extending this evidence to hops and the brewing industry. Therefore, the overall goal of this project is to develop and validate an analytical method that can be used to characterize smoke-taint in hops. Samples will be analyzed by Gas Chromatography – Mass Spectrometry using a non-targeted metabolomics approach. This will enable the detection of known VPs characteristic of smoke-taint in wine as well as the discovery of new markers specific to hops.<sup>7</sup> The results of this study will support the hop and brewing industries in their ability to assess the potential impact of wildfire exposure to hops.

### Project Objectives:

Our overall project goal will be addressed by the following objectives:

1. Develop a method for detection of volatile compounds that are characteristic of wildland fire smoke on hops using Headspace GC-MS.
2. Validate the method using “real world” hops that were exposed to wildland fire smoke during the 2020 growing season.