

Effect of Temperature on Packaged Hop Quality

Dr. Heather Darby, UVM Extension Agronomist
Julian Post, Conner Burke, Erica Cummings, Susan Monahan and Sara Ziegler
UVM Extension Crops and Soils Technicians
(802) 524-6501

Visit us on the web at

EFFECT OF CLIMATE ON PACKAGED HOP QUALITY

Dr. Heather Darby, University of Vermont Extension

heather.darby[at]uvm.edu

As the hop industry continues to expand in the Northeast, research is needed into best practices for processing and storing hops. While there are established systems for hop storage on large scale farms in the Pacific Northwest, there is a shortage of information on the systems being employed by growers in the Northeast. Many hop growers are choosing to vacuum-seal their hops in plastic bags. The goal of this project was to determine the effect of temperature on storage quality of dried, vacuum-sealed hops.

MATERIALS AND METHODS

Treatments were 3 temperatures with sample date as a co-variate. The Nugget hops used for this study were harvested in early September, dried to 8% moisture, and frozen in bulk vacuum-sealed bags for 7 months. Quality was measured shortly after the time of harvest. The bulk hops were divided into 21 separate samples before the start date. On 26-Mar

After 12 weeks of storage, the alpha and beta acids had degraded much further when stored at room temperature than samples stored in the refrigerator and freezer (Table 3). It is clear that storing samples at freezing results in the most stable storage especially over the long term. It is important to remember that these hops had already been stored for 6 months (in the freezer) prior to the experiment.

Table 3. Alpha acids, beta acids, and HSI by treatment, Burlington, VT 2014.

Temperature °F	Alpha acids %		Beta acids %		HSI	
0.2	12.16	a	9.64	a	0.211	b
37.1	11.73	b	9.21	b	0.215	b
72.4	9.80	c	7.63	c	0.358	a

Treatments indicated in **bold** had the top observed performance.

Treatments with the same letter to did not perform significantly different from each other.

Alpha acid degradation occurred the most quickly across the 12 weeks when stored at room temperature (Figure 1). However, the degradation increased exponentially when room temperature storage exceeded 2 weeks. From this research, it is clear that short term storage at temperatures below 40° F would lead to the least degradation of hop quality. For long term storage, hops should likely be maintained at temperatures close to freezing.

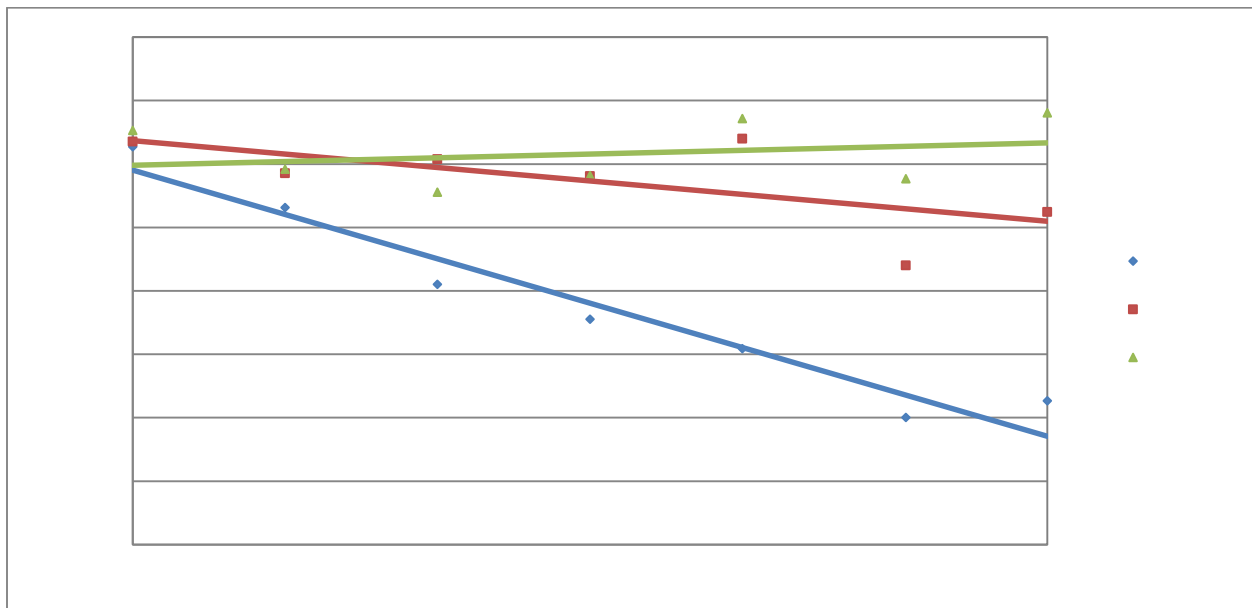


Figure 1: Degradation of alpha acids in hops stored at 3 temperatures across a 12 week period, Burlington, VT 2014.

ACKNOWLEDGEMENTS

The UVM Extension Crops and Soils Team would like to thank Borderview Research Farm and staff for their generous help with the trials. This work is made possible through funding provided by the USDA Hatch Initiative and The Environmental Protection Agency.

UVM Extension helps individuals and communities put research-based knowledge to work.



Any reference to commercial products, trade names, or brand names is for information only, and no endorsement or approval is intended. Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. University of Vermont Extension, Burlington, Vermont. University of Vermont Extension and U.S. Department of Agriculture, cooperating, offer education and employment to everyone without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status.