

Disentangling photoperiod from hop vernalization and dormancy for global production and speed breeding

William L. Bauerle

Scientific Reports volume 9, Article number: 16003 (2019)

Published: 05 November 2019

[Full Article](#)

<https://hapi.co.nz/wp-content/uploads/2020/01/Disentangling-photoperiod-from-hop.pdf>

Abstract

Humulus lupulus L. (hop) flowers are a key ingredient in beer, imparting the beverage's aroma and bitterness profile. Photoperiod is known to interact with temperature to control flowering in hops. Studies have stipulated that resting dormant buds on hops require a minimum chilling duration for their meristems to break dormancy and grow fruitfully. This assertion, in part, led to a long-held notion that hops require vernalization and/or dormancy for the meristem to change from a vegetative to floral state. The research in this study aims to separate photoperiod from vernalization and dormancy through a series of experiments that artificially control photoperiod to prevent the onset of dormancy and chilling exposure. Six experiments were performed to assess flower yield and quality for seven diverse hop cultivars (with and without exposure to chilling and dormancy) to quantify the impact on flowering performance. Vernalization and dormancy, two plant traits previously considered necessary to the proliferation of hop flowers, do not influence hop flower yield and quality. The findings have broad implications; global hop production can be distributed more widely and it paves the way for speed breeding and controlled-environment production to achieve 4 hop generation cycles per year, as opposed to 1 under field-grown conditions.

Bauerle, W.L. Disentangling photoperiod from hop vernalization and dormancy for global production and speed breeding. *Sci Rep* 9, 16003 (2019) doi:10.1038/s41598-019-52548-0

Open Access: This article is licensed under a Creative Commons Attribution 4.0 International License <http://creativecommons.org/licenses/by/4.0/>