



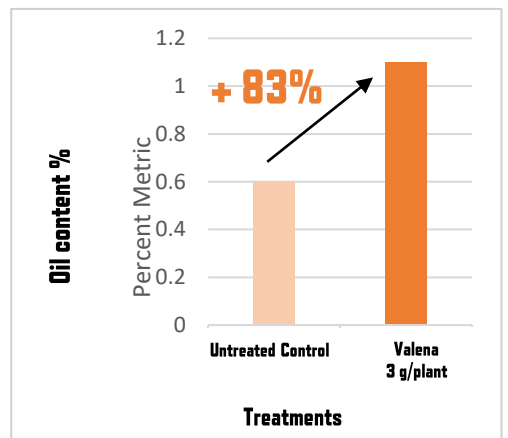
Valena™

FERTILIZER

HIGHER YIELD AND QUALITY HOPS WITH VALENA™

BENEFITS OF VALENA

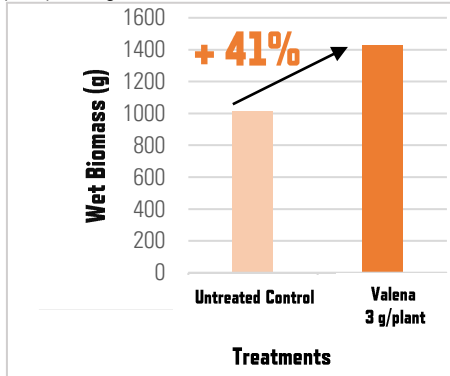
- Sustainable and environmentally friendly microalgae-based soil technology for thriving plant growth
- Effective soil treatment for rhizome-grown hop plants
- Helps increase hop values and marketable yield in first-year planting.



83% INCREASE IN THE CONE OIL CONTENT PRODUCTION OVER THE UNTREATED CONTROL

VALENA HELPS PRODUCE QUALITY HOPS

Centennial hop rhizomes were planted in a Pacific North West farm field and grown following standard hops growing practice in the Spring of 2018. Rhizomes were treated by applying 3 grams per hill placed in the bottom of the hole prior to planting. The wet cone biomass and the storage index were measured from one bine in first year planting.



VALENA INCREASED TOTAL HOPS BIOMASS BY 41% FOR RHIZOME TREATED PLANTS!

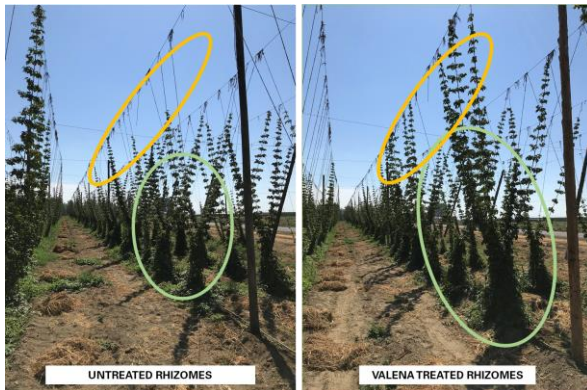
FRESH HOP

The Hop Storage Index (HSI) measured at harvest is a useful indicator of hop quality for growers and freshness for brewers as it estimates the degradation and loss of alpha and beta acids during storage and handling of hops. HSI levels below 0.30* are an indication of good quality hops. Valena provided a HIS of **0.254** verifying that Valena can help with the handling of hops during picking, storage and processing.

*Van Holle (2017)

HEALTHIER LOOKING HOP BINES WITH VALENA

Visual comparison of centennial hop plants health and growth between treatment sets the day of harvest.



Hop rhizomes soil-treated with Valena appear to be responsive and produced larger, higher branching and healthier looking plants than the untreated bines.

Source: Private Spring trial 2018; courtesy of a Pacific Northwest hop farm. Kemin Internal document – TD-19-5223

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ABOUT VALENA

- Dry granular soil amendment
- Derived from Kemin proprietary strain of whole dried cell *Euglena gracilis* unicellular algae rich in paramylon (50%)
- Paramylon is a large carbohydrate storage molecule that is made up of linear chains of unique 1,3-β-glucan favorable for plant growth.

GUARANTEED ANALYSIS

- Carbohydrate ≥50%
- Crude Protein ≥20%
- Total Nitrogen (N) ≥2%
- Total Phosphorus (P2O5) ≥1%
- Total Potassium (K2O) ≥0.2%

SMART MODE OF ACTION

Valena primes the soil by breaking down and releasing 1,3-β-glucan viewed as a Pathogen-Associated Molecular Patterns (PAMPs) by the plant's cells. Consequently, the plant elicits its defense responses and increases nutrient uptake to fight off potential pathogens. However, with no real threat, this leads to optimal growth for the plant.

DIRECTION FOR USE

- **Site:** Hop rhizomes or actively growing rooted transplants
- **Rate:** 3 g/hill
- **Timing:** Only one application / season, at field transplanting in Spring
- **Application Method:** Incorporate the desired amount into the bottom of the hill prior to transplanting. Proceed with standard irrigation and fertilization practices.