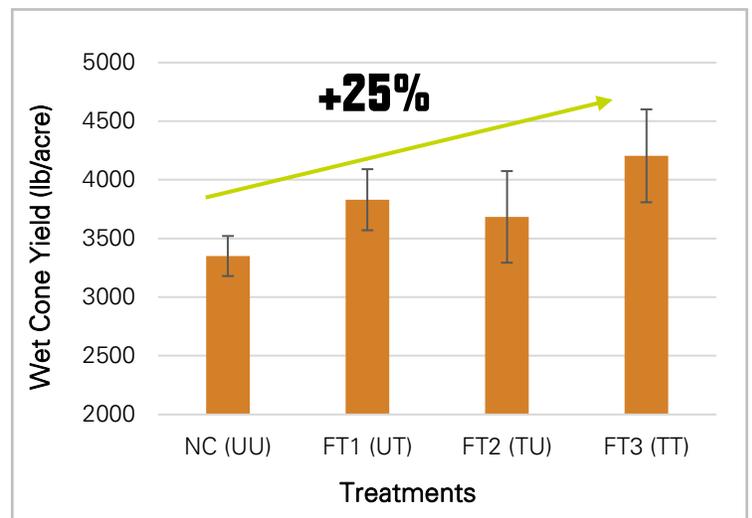




POSITIVE EFFECTS ON HOP AND HIGHER YIELD WITH VALENA™

BENEFITS OF VALENA

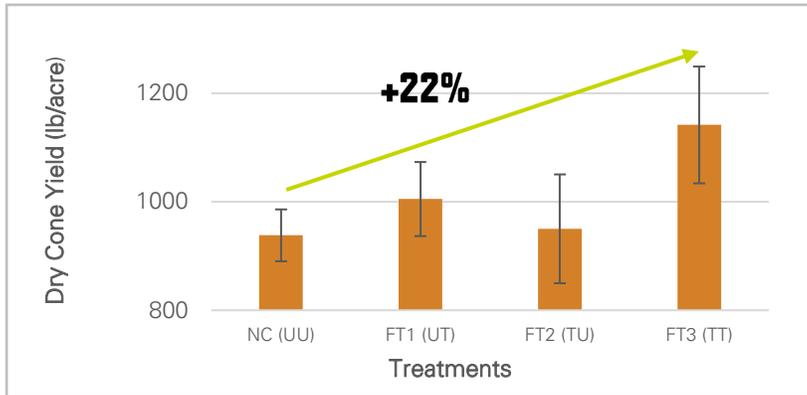
- Valena, when amended to the soil, primes the growing environment, helping to start with a more actively growing and healthier plant.
- Valena, applied to hop rhizomes, helps enhance the water and nutrient uptake by the crop, resulting in a higher yield increase.
- The addition of Valena to the soil may aid in reducing the grower's exposure to the ever-increasing volatility of environmental stresses and changing market conditions, leading to more profitable farming.



Fresh (wet) cone harvest weight for each treatment (detail back page).

VALENATM HAS A POSITIVE IMPACT ON HOP PRODUCTION

THIRD PARTY COMMERCIAL FIELD TRIAL - Crop: Commercial hop from a leading Washington hop grower (var. *centennial*). **Goal:** To demonstrate the impact of Valena on the overall yield increase in pounds of dry hops cones. **Growing Practice:** Standard. **Treatments:** Untreated or treated with Valena 3 g/ soil volume in the greenhouse pot or in the bed hole prior to planting in the field; NC (UU) = hops were untreated both in the greenhouse and in preparation for the field; FT1 (UT) = hops were untreated in the greenhouse but treated for the field; FT2 (TU) = hops were treated in the greenhouse but not treated for the field; and FT3 (TT) = hops were treated both in the greenhouse and for the field transplanting. **Transplants:** Planted in randomized block design in 14-acre field. 4 plants/hill with 7 hills per block (5 replicate blocks/ treatment (N = 140)). **Harvest:** Fresh hop cones were picked by hand starting September 4 and finished on September 5, 2019. **Data collection:** The cones were weighed for fresh weight and taken to Analytics 360 Lab for determination of dry weight, total acids, total oils and terpene profiles.



Dry cone harvest weight for each treatment.

VALENA APPLIED AT 3 GRAMS PER RHIZOME, TWICE DURING THE GROWING SEASON, RESULTED IN A GREATER THAN 200 POUNDS PER ACRE (22%) INCREASE IN TOTAL HARVESTED POUNDS OF HOPS.

THE INCOME DOLLAR PER ACRE IS INCREASED WITH VALENA

The calculation of the additional cumulative increase in income from the harvested yield data. Assumptions based on *Centennial* hops planted in the trial (4 plants per hill, 444 hills per acre).

Treatment	Total Dry Pounds per Acre	Increase in Dry Pounds per Acre	\$6/lb Market Price		\$10/lb Market Price	
			Total income per Acre (\$)	Increase over control per Acre (\$)	Total income per Acre (\$)	Increase over control per Acre (\$)
NC (UU)	938	-	5,628	-	9,380	-
FT1 (UT)	1,005	67	6,030	401	10,050	670
FT2 (TU)	950	12	5,700	72	9,500	120
FT3 (TT)	1,142	204	6,852	1,224	11,420	2,040

VALENA TREATED PLANTS RETURNED A HIGHER TOTAL INCOME PER ACRE OVER THE CONTROL, GREATER THAN \$2,000 OF ADDITIONAL INCOME DURING THE SEASON.

ABOUT VALENA

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

GUARANTEED ANALYSIS

- Beta-glucan ≥50%
- 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 thriving plant growth.

DIRECTIONS FOR USE

- **Sites:** Hop transplant pots or field (bed).
- **Recommended rates:** 3 g/plant (pot or bed hole)
- **Recommended application methods:**
 - **Pot:** Mixed in the soil or as top dress
 - **Bed treatment:** Incorporate into the bottom of the bed prior to planting
- **Recommended timing:** One application/season
 - **Transplant bed treatment:** At field transplanting

Source: SD-19-21746; image IMG-KCT-00251.

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