

# FOOTPRINTS

AHTANUM™ · CITRA® · EKUANOT™ · LORAL™ · MOSAIC® · PALISADE® · SIMCOE® · WARRIOR®



SELECT  
BOTANICALS  
G · R ·  · U · P

SEMI-ANNUAL REPORT · SPRING 2017



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In the previous issue of this publication we introduced the FOOTPRINTS™ brand management program. FOOTPRINTS™ represents the symbolic and tangible expression of our values. We leave footprints everywhere: in the field, in our communities, and in each other's lives. By extension, FOOTPRINTS™ then represents the collective scope of our impact. As a company, we spent a significant amount of the past year focusing on what this truly means to us, pressing ourselves to reflect on our purpose and how to best articulate and express it.

Through this process, we have come to recognize that we prosper only when the connection between grower and brewer is strong and beer drinkers are satisfied. Therefore, *our purpose is to create, grow, and protect value for all within our footprint through developing first class hop varieties, relentlessly pursuing quality, and building meaningful relationships.* These are not abstract concepts to us. We define our FOOTPRINTS™ as being everyone and everything from grower to beer drinker. First class hop varieties provide innovative solutions that create long term value. When we talk of quality, we mean products and services that drive the industry standard. Finally, we develop relationships that are intentional, respectful, responsive, transparent, and mutually beneficial.

This purpose is driving us toward our vision of a new normal in the hop trade where mutual benefit between stakeholders is the key driver of success, resulting in true sustainability.

This publication is meant to illustrate our commitment to our purpose and the passion for our vision. If you have any questions about the content or our company in general, I encourage you to reach out to myself, or one of our team members directly. We would be happy to answer them for you.

Thank you for reading,

Jason Perrault, CEO



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**BE CREATIVE • BE ACCOUNTABLE  
CONTRIBUTE • GROW • BE BOLD**

## **OUR STORY**

Select Botanicals Group, LLC (SBG) is an integrated crop management company specializing in breeding new hop varieties for the global brewing industry. SBG exists to create and sustain value in the hop market from the family farm, to the drinkers of great beer worldwide. In the late 1980's, three hop farming families, the Carpenters, Perraults and Smiths, came together to form Yakima Chief Ranches (YCR), a new hop production company with an additional focus on hop research and breeding. Several new hop brands; AHTANUM™, SIMCOE®, WARRIOR®, and PALISADE® were selected and released from the YCR breeding program. In 2002, the YCR breeding program became the company known today as Select Botanicals Group.

The SBG breeding program joined forces with the John I. Haas, Inc. breeding program to form Hop Breeding Company (HBC) in 2003. HBC's mission is to develop pest-resistant and disease-resistant hop brands with strong commercial qualities. This hop breeding powerhouse takes advantage of the combined resources of both companies through full integration of breeding efforts. All brands from the breeding program are released jointly. CITRA®, MOSAIC®, EKUANOT™, and LORAL™ are among the popular brands released since the formation of the company. We strongly believe in partnering with grower owned companies to get our hops to market, and have strategically aligned with Yakima Chief-Hopunion (YCH) as our handler and distributor of choice.

# GROWER OWNED VALUE CHAIN

## YAKIMA CHIEF-HOPUNION

The SBG - YCH value chain is designed to create value across the entire supply chain to meet the long term needs of all stakeholders. This value chain supports the missions of SBG and YCH through comprehensive sustainability programs that are unique to the grower owned supply chain.

THE GROWER OWNED VALUE CHAIN		
	<b>VARIETAL DEVELOPMENT</b>	 <ul style="list-style-type: none"> <li>Developing and releasing novel, disease resistant varieties that benefit brewer and grower</li> </ul>
	<b>FOOTPRINTS™</b>	<p><b>Brand Management Program</b></p> <ul style="list-style-type: none"> <li>Varietal purity</li> <li>Best growing practices</li> <li>Optimal harvest timing</li> <li>Summer internship program</li> </ul> <p><b>Economic Sustainability</b></p> <ul style="list-style-type: none"> <li>Cost based returns that incentivize reinvestment and quality</li> </ul> <p><b>Supply Chain Management</b></p> <ul style="list-style-type: none"> <li>Diversified growing regions</li> <li>Long-term auto renewing contracts</li> <li>Data driven volume management</li> <li>Novel contracting between brewer and grower</li> </ul> <p><b>Stewardship</b></p> <ul style="list-style-type: none"> <li>Investing in our local community</li> </ul> <p><b>Employee Development</b></p> <ul style="list-style-type: none"> <li>Educational advancement</li> <li>Personal enrichment opportunities</li> </ul>
	<b>GREENCHIEF®</b>	<p><b>Food Safety on the Farm</b></p> <ul style="list-style-type: none"> <li>Food safety checklists modeled after USDA GAP</li> <li>Facility improvement and implementation program</li> </ul> <p><b>Best Harvest Practices</b></p> <ul style="list-style-type: none"> <li>Proper kiln temperatures</li> <li>Optimal moisture content</li> <li>Storage, handling, and receiving requirements</li> </ul> <p><b>Data Collection</b></p> <ul style="list-style-type: none"> <li>Harvest data information</li> <li>Pest control records</li> </ul> <p><b>Sustainable Farming</b></p> <ul style="list-style-type: none"> <li>Assessment of sustainable farming practices using the <i>Sustainable Agriculture Initiative's Farm Sustainability Assessment</i></li> <li>Measuring and reducing environmental impacts of growing hops</li> </ul> <p><b>Best Practices Team</b></p> <ul style="list-style-type: none"> <li>Collaboration between farmers to develop best practices for yield, quality, and sustainable farming</li> </ul> <p><b>Grower Feedback</b></p> <ul style="list-style-type: none"> <li>Analysis of hops received, trueness to type, oil content and brewing values</li> <li>Annual quality reports including feedback from brewers</li> <li>One-on-one meetings with SBG to assist with improved quality</li> </ul>
	<b>TECHNICAL, INVENTORY, MARKETING AND BREWER SUPPORT</b>	<p><b>Brewer Support</b></p> <ul style="list-style-type: none"> <li>Support/involvement in trade: MBAA, guilds, and tradeshow</li> <li>Hop brand technical information and regional brewing experts</li> </ul> <p><b>Brewery and Beer Market Connection</b></p> <ul style="list-style-type: none"> <li>Brewery relationships, trend management, USA hops market exposure</li> <li>Brewing technical support: problem solving, recipe creation, hop usage improvements, and hop efficiency training</li> <li>Support of brewery events, educational programs, and lab support for beer</li> </ul> <p><b>Processing and Packaging</b></p> <ul style="list-style-type: none"> <li>Highest quality: pelletization, CO2 Extraction, Mini Baling, and LupuLN2 production</li> <li>Lab support from bales to finished products</li> </ul> <p><b>Storage &amp; Handling of Finished Goods</b></p> <ul style="list-style-type: none"> <li>Inventory management and logistical support to ensure finished goods are stored, inventoried, and delivered to brewing partners</li> </ul> <p><b>Hop Industry Leadership &amp; Support</b></p> <ul style="list-style-type: none"> <li>Members of trade organizations: International Hop Growers, Hop Research Council, Hop Liaison Committee (Hop Lab and Hop Commission), American Society of Brewing Chemists</li> </ul> <p><b>Brewer Feedback</b></p> <ul style="list-style-type: none"> <li>Hop selection - qualitative feedback delivered directly to growers</li> <li>Brewing with new hop varieties</li> </ul>

For additional information visit: [selecthops.com](http://selecthops.com) and [ychhops.com](http://ychhops.com)



## SELECT BOTANICALS GROUP BRANDS

AHTANUM™ BRAND YCR-1		ALPHA	BETA	CO-H	TOTAL OIL	RELEASE DATE
	Citrus • Earthy • Floral	5.7-6.3%	5-6.5%	30-35%	0.8-1.2 ml	1997
AHTANUM™ Brand YCR-1 is the first brand to have been bred and released from the SBG breeding program. It is an aroma hop utilized for its unique aromatic properties and moderate bittering.						
PALISADE® BRAND YCR-4		ALPHA	BETA	CO-H	TOTAL OIL	RELEASE DATE
	Apricot • Grass • Floral	5.5-9.5%	6-8%	24-29%	1.4-1.6 ml	2003
PALISADE® Brand YCR-4 is an aroma hop that is well known for its amazing yield and unique aroma. PALISADE® is used regularly in commercial brewing.						
SIMCOE® BRAND YCR-14		ALPHA	BETA	CO-H	TOTAL OIL	RELEASE DATE
	Piney • Citrus • Passion Fruit • Earthy	12-14%	4-5%	15-20%	2-2.5 ml	2000
SIMCOE® Brand YCR-14 hops are recognized for their brewing versatility and unique aromas. SIMCOE® hops boast several different aromas, with strong bittering qualities, and an alpha acid level of 12-14%.						
WARRIOR® BRAND YCR-5		ALPHA	BETA	CO-H	TOTAL OIL	RELEASE DATE
	Very clean bittering hop	15-18%	4.3-5.3%	22-26%	1.3-1.7 ml	2000
WARRIOR® Brand YCR-5 hop is an alpha hop used for its mild, clean bittering qualities, which translate well into American pale ales and IPAs.						

## HOP BREEDING COMPANY BRANDS

CITRA® BRAND HBC 394		ALPHA	BETA	CO-H	TOTAL OIL	RELEASE DATE
	Tropical Fruit • Grapefruit • Melon Gooseberry • Lychee Fruit • Citrus	11-13%	3.5-4.5%	22-24%	2.2-2.8 ml	2007
The CITRA® Brand HBC 394 hop has fairly high alpha acids and total oil contents, with a low percentage of cohumulone. CITRA® hops impart interesting citrus and tropical fruit characters to beer.						
MOSAIC® BRAND HBC 369		ALPHA	BETA	CO-H	TOTAL OIL	RELEASE DATE
	Fruity • Floral • Citrus • Earthy • Melon Tropical • Blueberry • Grassy	11.5-13.5%	3.2-3.9%	24-26%	1-1.5 ml	2012
MOSAIC® Brand HBC 369 hops offer a unique and complex blend of tropical, fruity, and earthy characteristics that translate very favorably into a variety of beer styles. The MOSAIC® name is derived from the artistic assortment of aromas and flavors it is capable of presenting.						
LORAL™ BRAND HBC 291		ALPHA	BETA	CO-H	TOTAL OIL	RELEASE DATE
	Floral • Citrus • Peppery • Dark Fruit	11.3-12.2%	4.9-5.4%	21-24%	1.8-2.9 ml	2016
LORAL™ Brand HBC 291 is the newest hop brand to be released from the HBC breeding program. With a noble heritage, LORAL™ straddles the fence between old and new world hop aromatics and is truly complementary to all beer styles.						



## BRAND HIGHLIGHT - EKUANOT™

Released in 2014, the EKUANOT™ brand continues to generate excitement with brewers and growers. Strong yields, a forgiving late harvest window, and excellent pickability combine to make EKUANOT™ a very grower friendly hop. Brewers welcome the high oils and compatibility with other hop brands when using EKUANOT™ in their recipes.

“EKUANOT™ forced its way into the majority of our newer hoppy beers in 2016. The heady combination of earth, dank, and blueberry, coupled with its blazing intensity, balances the more fruit and citrus forward hops, ensuring it’s a mandatory addition to most of our hop bills.”

– Matt  
Halfacre Beer Company

“We love EKUANOT™ for it’s high resinous oils, punchy tropical fruitiness and complex citrus flavors and aromas. EKUANOT™ is a wonderful supporting hop that shines late in the kettle, whirlpool, hop back or used as a dry hop.”

– Matt  
Fat Heads Brewery

“EKUANOT™ has worked very well for us on its own in a single-hop beer, as well as blended with other exciting Pacific Northwest hops. Lots of tropical character like MOSAIC®, along with some unique spicy/pepper qualities. Watch the high cohumulone if used aggressively in the kettle. We favor it during whirlpool and dry hopping.”

– Zack  
Moonraker Brewing Co.

“We worked EKUANOT™ into a new IPA released this year. The range of character is what drew us to it with notes including citrus, berry, and a nice dank piney note that lends itself nicely to the aroma and flavor of our IPA. While it would be an excellent stand-alone IPA hop, the ability to play well with others is our favorite attribute. It brings its own range of character to accentuate the notes of the other varieties present.”

– Luke  
Hiwire Brewing Co.

“We are skeptical of every new hop and don’t contract until we have tested it thoroughly. EKUANOT™ was a big hit, instead of a generic sweet fruitiness, it had a genuine and bold fresh cut citrus character that we haven’t found elsewhere. It’s like the quintessential west-coast hop profile married with a farmers market.”

– Alex  
Fieldwork Brewing Co.

EKUANOT™ BRAND HBC 366	ALPHA	BETA	CO-H	TOTAL OIL	RELEASE DATE
 Melon • Berry • Citrus-Lime Apple • Papaya • Green Pepper	14.5-15.5%	4.5-5.5%	32-38%	2.5-4.5 ml	2014
EKUANOT™ Brand HBC 366 bursts out of the spring soil a vibrant yellow, and then matures to a deep green by fall harvest. EKUANOT™ not only has dynamic aromas, but also an extremely high oil content.					

**WANT TO TRY EKUANOT™?**

Contact Yakima Chief-Hopunion • [ychhops.com](http://ychhops.com)



# VARIETY DEVELOPMENT

DEVELOPMENT TAKES 11+ YEARS FROM INITIAL CROSS TO COMMERCIALIZATION



Hops are bred for distinct markets: alpha and aroma. The first is measured in (kg) alpha per acre, while the latter employs minimal processing and is measured in pounds per acre. HBC breeds for aromatic qualities and higher alphas; variety development considers higher yield, pest and disease resistance, good storage stability, and specific oil compounds as essential factors in our breeding initiatives.

A key driver for determining breeding initiatives is the goal of providing exceptional value to all levels of the industry. We look to benefit stakeholders by supplying unique raw materials to brewers that are agronomically beneficial to growers. This comes with a significant challenge: time. It takes 11 plus years to breed a commercial hop from initial cross to commercialization. How do we determine which hops to select? By maintaining open communication with brewers and growers throughout the supply chain, and incorporating their input into the breeding program, we are able to make advances in selections that benefit both parties, creating a true partnership.

SBG also believes that sustaining exceptional value is equally important as creating it. Through FOOTPRINTS™, SBG's comprehensive brand management program, we strive to maintain purity, quality, and value in both existing brands and new releases. Please refer to pages 9 and 10 for additional information.

YEAR 1	<b>PARENTAL SELECTION AND CROSSING</b> <ul style="list-style-type: none"><li>• Based on breeding initiatives</li></ul>
YEAR 2	<b>EARLY SELECTION</b> <ul style="list-style-type: none"><li>• Greenhouse screening</li><li>• High density field screening</li><li>• 10% selection rate</li></ul>
YEARS 3-5	<b>INTERMEDIATE SELECTION</b> <ul style="list-style-type: none"><li>• Remaining plants transplanted to 18' trellis</li><li>• 1% selection rate</li></ul>
YEARS 6-8	<b>ADVANCED SELECTION</b> <ul style="list-style-type: none"><li>• Expand selection to multi-plant pots</li><li>• 2% selection rate</li></ul>
YEARS 9-11	<b>ELITE TRIALS</b> <ul style="list-style-type: none"><li>• Selection expanded to commercial trials</li><li>• Selection rate: &lt;1%</li></ul>
YEARS 11+	<b>COMMERCIALIZATION</b>

# PIPELINE REPORT

## HOPS ON THE HORIZON

Hop Breeding Company has dozens of selections that are in the advanced stages of the breeding program. Annually, HBC reviews the data collected during the previous year's hop production and makes the decision to advance or remove a selection from the program. The following selections continue to create excitement with our various brewer and grower trials, and one or all may be the next selection to make it to market.

HBC 438		ALPHA	BETA	CO-H	TOTAL OIL
	Peachy Stone Fruit • Tropical Pineapple Lime • Cedar • Coconut	12.4-14.9%	5.1-6.0%	23.5-24.6%	3.0-3.4 ml
HBC 438's wild neomexicanus heritage contributes to a unique aroma profile. Its high alpha acids provide valuable efficiency, with a complex aroma described as remarkably distinct and pleasant.					

HBC 472		ALPHA	BETA	CO-H	TOTAL OIL
	Woody • Herbal • Vanilla Floral • Tropical Fruit	7.5-9.6%	7.1-8.8%	46.8-48.7%	1.4-1.9 ml
HBC 472 is a sister to HBC 438 and also derived from a wild neomexicanus cross. HBC 472 is unparalleled in its unique aroma and flavor, imparting an oaky/bourbon wood aged character to beer.					

HBC 520		ALPHA	BETA	CO-H	TOTAL OIL
	Vanilla • Cedar • Fruity	10.2-12.8%	4.8-6%	22.5-23.4%	1.6-2.0 ml
HBC 520 exhibits exceptionally unique aromas that translate very well in beer. The aromas combined with early maturity, and good yield make this an experimental hop with great potential.					

HBC 522		ALPHA	BETA	CO-H	TOTAL OIL
	Citrus • Floral <i>Similar to Centennial and Cascade</i>	9.9-11.7%	4.5-5.4%	24.8%	1.4-2.3 ml
HBC 522 boasts an outstanding aroma reminiscent of the finest Cascade and Centennial hops. While notable for its aroma, HBC 522 is attractive to both growers and brewers alike because of its strong yield and late maturity.					

HBC 682		ALPHA	BETA	CO-H	TOTAL OIL
	Primarily a high alpha hop with mild, herbal, floral, and spicy characteristics	19.4-22%	5.1-5.9%	28.2-31.6%	1.6-2.5 ml
With extremely high alpha acid levels and good yield, HBC 682 also exhibits mild and pleasant aromatic qualities. It is a powerhouse of efficiency in both the field and the brew kettle.					

# FOOTPRINTS™

## SBG'S BRAND MANAGEMENT PROGRAM

FOOTPRINTS™ is the comprehensive brand management program that SBG employs to ensure the highest level of attention is given to the growing and harvesting of our hops. We employ fully-dedicated personnel to make certain these standards are met. Since the inception of FOOTPRINTS™ in 2012, SBG managed brands have consistently been among the purest and highest quality hops on the market and have garnered an excellent reputation for quality and consistency.

### VARIETAL PURITY

SBG supplies true to type rootstock for each managed brand ensuring varietal purity.

- New plantings shall occur in fields that did not previously cultivate hops. If a field did have hops in the ground, it must be fumigated prior to planting any SBG managed brand.
- Yards are scouted throughout the year to identify any off-types or males. If off-type plants are located, their removal is coordinated with the grower.

### CROP MANAGEMENT

SBG works with growers to ensure best management practices are applied to each brand.

This includes:

- Optimal training dates.
- Integrated grower support through joint collaboration with YCH.
- Optimized harvest window dates.
- All SBG managed fields are GPS mapped to aid in crop management and traceability.

### FOOD SAFETY

SBG is committed to providing brewers with the cleanest, highest-quality hops possible. To maintain this commitment, SBG requires adherence to YCH's GreenChief® farm quality program.

- An early season facility walkthrough is conducted at every farm to help growers identify potential issues with food safety.
- A pre-harvest audit ensures any food safety infraction identified during the early season walkthrough has been addressed.
- Ongoing food safety training is required for SBG employees.
- Pesticide use is monitored to ensure all applications are administered within the legal limits for pesticide residues.

### HARVEST QUALITY & TRACEABILITY

Even the highest quality crop can be compromised with faulty harvest and kilning practices. SBG requires specific standards on how our brands are harvested to ensure a consistent, high-quality product.

- Aroma hops are dried at a lower temperature (as dictated by individual varietal standards) to preserve oil content.
- Hops must be clean, free of debris, and a consistent green color true to type.
- Kiln depth may not exceed 30 inches to maintain a uniform dryness.
- Delivered bales must have a moisture rating between 8.5% and 10.5%.
- SBG and YCH employ key measures of traceability to ensure SBG hops can be monitored from the fields of our growers to the fermenters of our customers.
- We provide detailed annual performance reports and rankings to growers for feedback and continuous improvement opportunities.

## 2016 RECAP

Every new hop growing season begins with propagation. As soon as the ground thaws enough to allow people and implements into the fields we start digging roots. Root digging in 2016 began in late February, we worked with 10 different farms to procure and deliver the highest quality rootstock available for new acreage planting. Sustainable digging methods, higher than average workforce wages, controlled atmosphere storage, virility and size screening, combined with additional quality assurance measures are all part of our commitment to top notch propagation. We also take great pride in working closely with all of our growers; providing them with bins for storing the roots, and pick-up and delivery of those bins once planting is complete.

The 2016 field season proved to be another great year to spend in the hop fields of the Pacific Northwest. With the help of our amazing and dedicated interns, we were able to traverse every row of every field planted with SBG managed brands. By employing a stringent “boots on the ground” approach to phenotyping and Integrated Pest Management, SBG is setting a standard in the hop industry that is unmatched in scope and service. Despite early bloom and high pollen counts, we were able to assist our growers in cultivating beautiful stands of true to type crops, that were also far below the industry averages for seed and stem. Taking the time to listen and learn from our growers, and investing in the resources necessary to serve their needs, is the SBG difference!

## QUALITY UPDATE

In the US hop industry there has never been such a demand for volume and quality placed on growers and dealers. We are all learning how to balance this new normal together. Traditionally, hops have been a commodity, largely being sold as generic alpha. Pricing has been variable, and many farms were more concerned with survival than sustainability. Open air facilities housed decades-old pickers and kilns designed for quickness, not necessarily quality. The times, however, have now changed.

The rising quality requirements have been coupled with an incredible demand for volume. Hop acreage has grown at double digits, and new contracts have been at a level that is providing economic sustainability for growers. This growth has enabled growers to purchase land and trellis while also reinvesting in picking infrastructure. Over the last several years, the balance of quality and supply has not always been perfect; there is often a lag between capital to invest in the required infrastructure, while simultaneously covering growing costs. At times, picking windows have been stretched to meet supply demands, which has been detrimental to quality. SBG has, and always will, put quality first. We work very closely with growers to ensure they have capacity to pick our brands at peak maturity, but there are times when farms simply cannot keep up, and this, presents some challenges.

The 2017 crop year will likely be the first year since 2009 that the hop industry has seen growth in aroma acreage below double digits. Growers will not have to juggle the seemingly never-ending issue of increasing acreage while concurrently meeting quality requirements. This will be an opportunity for growers to focus solely on producing the highest quality, most consistent product possible.

SBG, in partnership with YCH, is further supporting growers by improving an already comprehensive quality assurance program to meet the goal of only delivering the highest level quality product to brewers. Starting this year, any hops that do not meet minimum quality standards will not be accepted at YCH, and will not be offered for sale under the associated brand. This standard will increase brewer confidence that any SBG managed brand shipped with a YCH label, will arrive with the highest consistency of quality and freshness.

All quality assurance activities are monitored through a comprehensive collaboration between growers, SBG, and YCH. SBG employs a summer intern crew and full time quality management team through our FOOTPRINTS™ brand management program to monitor varietal purity and harvest quality. YCH utilizes brewer feedback, harvest receiving quality checks, and GreenChief® staff. Growers work with both SBG and YCH to assure that all quality parameters are met.

It is our sincere hope that brewers and growers profit in a long term, truly beneficial relationship. We believe that starts with consistency and transparency, and ends with the highest possible quality and true sustainability.





## OUR INTERNS

Summer 2016

SBG recruits currently enrolled or newly graduated men and women from top-tier science and research institutions across the nation to participate in our summer internship program. Interns join SBG's team in Toppenish, Washington to form the backbone of SBG's FOOTPRINTS™ brand management program.

While the majority of the time is spent on quality assurance in the hop fields, interns are also exposed to a myriad of educational modules and enrichment opportunities, which provide a holistic understanding of the hop industry. Weekly seminars on hop breeding, supply chain management, hop chemistry, pilot batch brewing, sensory analysis, and hop processing are interspersed throughout the regular regimen of field scouting for male and off-type plants, mildews, mites, and other hop crop quality initiatives.

SBG actively works to facilitate each intern's entrance into the career path that best fits their interests, and skills, helping to bolster the farming and brewing communities with young bright minds. SBG interns have secured positions at several organizations in both the brewing and farming industries. To highlight this, please see the list of the 2013-2016 SBG interns on the following page.

## SBG INTERNS INVESTING IN THE INDUSTRY

### ... 2013

#### Joe Catron

Quality Assurance Manager  
Select Botanicals Group, LLC - Toppenish, WA

#### Wendy Lopez

R&D Advanced Products Pilot Plant Technician  
John I. Haas - Yakima, WA

#### Sam Turner

Head Agronomist  
BT Loftus Ranches - Yakima, WA

### ... 2014

#### Kyle Charvet

Processing Manager  
Roy Farms, Inc. - Moxee, WA

#### Connor McDermott

Brewing Intern  
BrewDog - Scotland

#### Victor Nunez

Extract Plant Specialist  
Yakima Chief-Hopunion - Yakima, WA

#### Todd Siefke

Brand Ambassador  
Wandering Aengus Cider - Salem, OR

### ... 2015

#### Kevin Coles

Agronomist  
Oasis Farms - Prosser, WA

#### Alicia Collier

Brewhouse Intern  
Boston Beer Company - Boston, MA

#### Hunter French

Shift Brewer  
Pfriem Family Brewers - Hood River, OR

#### Scott Herzog

Breeding Quality Assistant  
John I. Haas - Yakima, WA

#### Phil Huff

Agronomist  
BT Loftus Ranches - Yakima, WA

#### Jessica Lindner

Mountaineering Guide  
Colorado Springs, CO

#### Hannah McAughan

Quality Assurance  
E & J Gallo Winery - Modesto, CA

#### Patrick McLoughlin

Plant Breeding Graduate Student  
Mississippi State University - Starkville, MS

#### Todd Renner

Assistant Brewer  
Fat Head's Brewing Co. - North Olmstead, OH

#### Jared Ribail

Civil Engineering Undergrad Student  
Washington State University - Pullman, WA

#### Andrew Stickle

Special Projects Coordinator  
Perrault Farms - Toppenish, WA

#### Brett Wasik

Research Assistant  
University of Florida - Gainesville, FL

### ... 2016

#### Sean Brodie

Assistant Brewer  
Maui Brewing Co. - Kihei, HI

#### Nick Cowden

Sustainable Agricultural Undergrad Student  
Evergreen State College - Olympia, WA

#### Rose Croog

Agricultural Economics Graduate Student  
University of Connecticut - Storrs, CT

#### Hector Franco

Environmental Science Undergrad Student  
Heritage University - Toppenish, WA

#### Ashley Hale

Fermentation Science Undergrad Student  
Oregon State University - Corvallis, OR

#### Rick Kawalski

Horticulture Undergrad Student  
Michigan State University - East Lansing, MI

#### Mike Lowery

Plant Biology Graduate Student  
Kent State University - Kent, OH

#### Jamie Madsen

Lead Cultivator/Genetics Specialist  
Mother & Clone - Fort Collins, CO

#### Michelle McDonald

Research Technician  
Select Botanicals Group - Toppenish, WA

#### Marko Popovich

Environmental Engineering Undergrad Student  
Purdue University - West Lafayette, IN

#### Kasie Stach

Graduate Student  
Eastern Washington University - Cheney, WA

#### Derek Vermeer

Manager  
TV Hops - Wilder, ID





## CROP REPORT

Every year since 2009, demand has driven double and triple digit growth in new SBG managed acreage. As craft growth levels to more sustainable increases, acreage expansions will also slow. Growers will have an opportunity to take a break from the hectic spring plantings that have been a staple since 2009. In 2015 and 2016, SBG growers dug and planted over 12 million roots per year. We added over 20 growers in Washington, Oregon, and Idaho during that time. In 2017, that growth will slow substantially as supply finally catches up with demand.

### 2017 SBG PRODUCTION GOALS

7

MILLION LBS.  
**SIMCOE®**

630

THOUSAND LBS.  
**EKUANOT™**

4

MILLION LBS.  
**CITRA®**

440

THOUSAND LBS.  
**AHTANUM™**

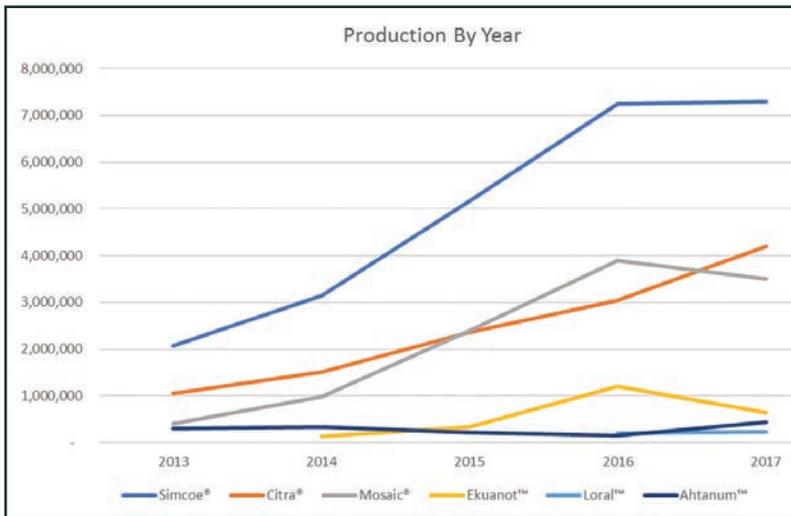
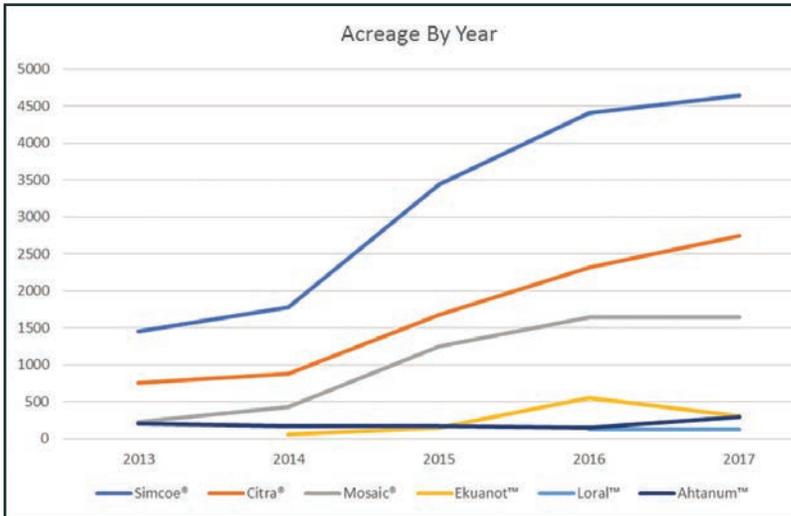
3

MILLION LBS.  
**MOSAIC®**

230

THOUSAND LBS.  
**LORAL™**

## HOP PRODUCTION



## HIGHLIGHTS



**SIMCOE®** yields will increase slightly as a result of the babies planted in 2016 in Oregon and Idaho.



2017 **CITRA®** acreage will continue to increase as demand continues to drive increased supply.



Strong 2016 yields for **MOSAIC®** are assisting with meeting current demand for the brand.



**EKUANOT™** acreage is balanced with 2017 production goals.



**LORAL™** will continue to grow in volume in 2017. With the majority of 2016 SBG LORAL™ acres as babies, there will be an increase in 2017 yield as they grow into a mature crop. LORAL™ is gaining popularity with brewers in Pilsner and Lager style beers, but has also been successfully showcased in other hop forward styles.



SBG's relaunch of **AHTANUM™** with Hop Stunt viroid free rootstock is allowing us to expand this brand.

## HARVEST WINDOWS - OPTIMIZING HOP QUALITY

Brand	Harvest Window and Peak Selection Dates Average range across Washington, Oregon, Idaho	
<b>SIMCOE®</b>	8/30 - 9/1 Aug 26 - Sept 12	Optimal Peak Selection Date
<b>CITRA®</b>	9/8 - 9/12 Sept 2 - Sept 15	
<b>MOSAIC®</b>	9/10 - 9/15 Sept 7 - Sept 18	
<b>LORAL™</b>	9/11 Sept 8 - Sept 13	
<b>PALISADE®</b>	9/18 Sept 12 - Sept 22	
<b>EKUANOT™</b>	9/22 Sept 15 - Sept 24	
<b>AHTANUM™</b>	9/19 Sept 16 - Sept 21	
<b>WARRIOR®</b>	9/29 Sept 24 - Oct 1	





## OUR GROWERS

SBG is proud to work with a diverse group of growers in the Pacific Northwest. To assure hop supply is met for brewers we continue to expand the amount of grower acreage. Beginning in 2011 with 3 growers, SBG has now expanded across 3 states - Washington, Oregon, and Idaho. Of the 42 farms we work with, there are multi-generation to first-generation operations. Each farm brings unique value to the hop industry, lending knowledge and inspiration to continue growing the finest hops possible.

### WASHINGTON 25 GROWERS

TOTAL ACRES  
9723



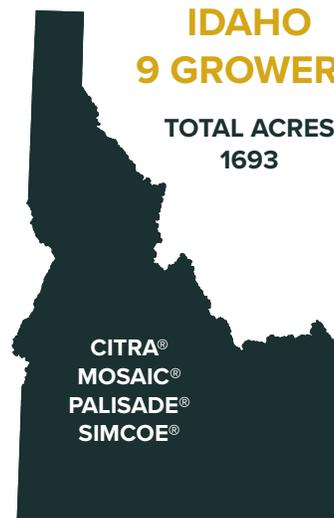
### OREGON 7 GROWERS

TOTAL ACRES  
1130



### IDAHO 9 GROWERS

TOTAL ACRES  
1693



*It is SBG's strategic alignment with YCH that enables the greatest revenue return to our growers. The 2016 YCH Sustainability Report provides data on revenue returns to growers. On average, our integrated supply chain returns 77% to growers, 5% to SBG, and 22% to YCH.*

## **SBG GROWER HIGHLIGHT**

### **BLACK STAR RANCH, MOXEE, WA**

Jeff Gamache Farms was established in 1935 when Jeff purchased a 30 acre piece of land in Moxee, Washington from his father George. For five years he grew mainly vegetables until 1940 when he purchased an adjacent piece of land and planted his first hops. Jeff continued to grow his farm, and his family over the years including moving a stationary hop machine to the Moxee Valley from California in 1957. This machine is being used as part of the harvest process to this day. In 1973 a new hop drying kiln was built. It incorporated an air recycling system, making it the only one of its kind and unlike any other in the world. Jeff believed strongly in producing the best quality products possible and instilled that belief in his family.

As the farm continued to grow, Jeff's sons, Dale, Gene, and Lee became an integral part of the farm operation. In 1979 Jeff's oldest grandson, Ed, would join the farm. In 1980 Jeff finally decided to turn the reigns over to the boys but would visit the farm daily until his death in November 2008. In 1991 Jeff Gamache Farms was one of the first hop farms to use sub surface drip irrigation. By 1997 they completed the conversion to drip, farming over 580 acres of hops without a drop of runoff water leaving the farm.

In 2002 Black Star Ranch LLC was established. With Lee retiring, Dale, Gene, and their nephew Ed would be the three pioneers of this new entity. Each one of them has served the agricultural industry with participation on industry boards and commissions, including Hop Growers of Washington, the Washington Hop Commission, the Yakima County Pest Board, and the Yakima County Planning Commission.

In 2001 Ed's eldest son, Ben, would join as the 5th generation of hop farmers in the family. Ben serves as an intricate part of hop production managing both labor and operations. Today they farm over 700 acres of hops and 250 acres of apples. Every year they continue to grow in acres and continue to add family back into the business. In 2014 they welcomed Ed's youngest son, Michael. He oversees the apple operation of the farm since Dale's retirement. In 2015 Gene's son, Chad, was brought to the team as farm controller and accountant. This next generation will guarantee that Black Star Ranch will continue to grow and be part of the ever evolving hop and apple industries in Washington State.

Black Star Ranch has a reputation for producing consistently high quality hops. Several years in a row their hops have been selected from blind selection processes by well- established and respected craft brewers. They have been recognized as "Hop Grower of the Year" by Miller-Coors several times and were awarded "Small Grower of the Year" by SBG for the 2015 crop. They continue to strive for the highest quality of products possible for their customers. Their commitment to their core values of honesty, integrity, and quality set them apart in this rapidly changing industry.



*Back row, from left; Lee Gamache, Ben St. Mary, Ed St. Mary, and Gene Gamache. Front row, from left; Jeff Gamache and Dale Gamache.*

**“We appreciate SBG’s commitment to bring a fair return to the growers for their products. They also provide opportunities to develop relationships with brewers, and through their best practices meetings, they give us the chance to interact with other growers and share ideas about meeting the challenges of growing some of the new brands that brewers are demanding.”**

**- Ed St. Mary  
Black Star Ranch**



# HOP CONTRACTING

## THE FOUNDATION OF MEANINGFUL RELATIONSHIPS

In response to the craft beer explosion, *hundreds of millions* of dollars have been spent in the Pacific Northwest on hops infrastructure in the past five years. Brewers and growers both desire environmental, human, economic, and social sustainability on the farm, but it comes with substantial risk.

This risk can be illustrated with a comparison between growing an agricultural product such as corn to hops. If one were to walk into any grocery store, they could find products made with corn in virtually every aisle; corn on the cob, canned corn, toothpaste, any product that has high fructose corn syrup, chewing gum, fuel, milk from corn fed cows, diapers, and even shampoo. Hops however, are only found in the beer aisle. Corn has hundreds of uses, hops have one. Growing hops is extraordinarily expensive compared to other agricultural products. A brief search reveals that the cost of growing an acre of corn is estimated to be \$385, an acre of soybeans or wheat \$195; an acre of hops cost \$7,500 to grow. These costs are compounded by the investment in adding new hop acreage. Investments required for land, machinery, and trellis is between \$15,000 and \$45,000 per acre, typically financed over 7-10 years. An average gross return of \$13,000 to \$14,000 per acre is an absolute requirement over a ten-year period for heavily invested farms to cover growing cost, profit, and debt servicing obligations. Responsible contracting at every level of the supply chain is more important than ever before.

Growers, dealers, and brewers need to work with transparency to balance supply with demand at reasonable prices, or there will be massive shifts in supply and pricing. Supply and demand alignment becomes a reality through responsible contracting, and open communication.

As a relatively extreme illustration, lack of communication can quickly lead to an oversupply of hops. If a brewer needs 10,000 pounds of hops, and the brewer, dealer, and grower each carry a 10% buffer above their needs, there will be over 30% excess hops planted than are needed. Given the craft beer explosion over the last several years, excess supply is likely to be used up by another brewer's growth, but that will not always be an option.

Looking back to the corn analogy, with no alternative uses for hops, any oversupply will sit in a warehouse, not in a brew kettle. There is no toothpaste or corn syrup to soak up the excess production. An oversupply of hops is problematic for growers, dealers, and brewers. This oversupply is what caused hop shortages historically; a glut in the market with no alternative use sits in a warehouse. Prices are likely to drop driving growers out of business. When supply levels drop, and there are fewer growers, there may not be enough acres in the ground to meet demand, and prices will rise.

Part of what makes the craft beer culture so great is the relationship between brewers and growers driving transparency and collaboration. Craft beer doesn't care about norms and tradition, it cares about what is real, what is creative, what sustains, and what is right. The creativity that drives craft beer drives us to create a new normal, of quality, transparency, and sustainability. Just because history tells us that hops always cycle through boom and bust doesn't mean that will happen.

We market our hops through YCH because of our shared commitment to long term sustainability for brewers and growers. We target how many pounds of a brand are needed, and jointly develop a plan for acreage expansion or reduction to align supply and demand. YCH manages a buffer to consistently get brewers their contracted volumes while not putting the grower at risk.

In the four years of working under this model, no brewer that had a contract with YCH for SIMCOE®, CITRA®, or Mosaic® has been shorted on their volumes. There have been some shortages in other SBG brands such as AHTANUM™ Brand YCR 1. This shortage has been driven by Hop Stunt viroid. In 2014 AHTANUM™ tested positive for Hop Stunt viroid, which dramatically impacted yield. In 2017, SBG is expanding AHTANUM™ acreage with Hop Stunt viroid free rootstock. The production from the expanded acreage will meet grower contracts this year and for years to come. This is the advantage of working with grower owned companies. YCH provides a unique opportunity for the brewing and hop growing communities; they connect brewers, breeders, and growers to create a cohesive, transparent supply chain. Taking full advantage of this opportunity to contract confidently and appropriately allows us to work together to create the long-term sustainability we all desire.



SELECT  
BOTANICALS  
G · R ·  · U · P

11051 Lateral A  
Toppenish, WA 98948



We believe in partnering with grower owned companies to get our hops to market. Yakima Chief-Hopunion is the handler and distributor of choice for our hops. For information on hop availability and contracting visit: [ychhops.com](http://ychhops.com).