

All Hopped Up

Happenings from the Midwest Hops Scene



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September/October 2009

Issue 5

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Family Additions GVH Has a New Logo!

We'd like you to meet Sam Wegner, son of Joe and Greta Wegner, owners of GVH. This is the first child with Joe and Greta and the family is doing well. Truth be told...I was waiting for this guy to show up before another newsletter went out.



Vital Statistics

Species: Human

Sex: Male

Weight: 9lbs, 9oz

Hair: More than Joe

Congratulations to Greta and Joe!
We're sure Sam will grow up to be a strong hop picker...

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GVH is dedicated to utilizing local services and materials whenever possible. When we decided to design a new logo we didn't have to go far. Robin Kourakis of Cross Plains, WI listened to my ranting and nit-picky comments and put together something we're very proud of. Not only is she a freelance artist, but also an art teacher at Middleton High school. Thanks, Robin for the outstanding work.

<http://www.madebyrobin.com/contact.htm>

GORST VALLEY HOPS

Mazomanie - Wisconsin



*Your beer
deserves the
best!*

**Last chance to register for the Midwest Hop Production Workshop, 101 level course!!! October 24th Cross Plains, WI.
www.gorstvalleyhops.com for more info.**

Calendar of Events

In the Field

Fall Clean-up

Weed Control: hand work or foliar burn-down

Irrigation: Blow out lines, shut system down

Nutrients: Look to amend soil with manure

2010 Pre-planning: Yes, I'm serious

In the Classroom

Pre planning for the Fall Midwest Hops Production

Workshop, Cross Plains WI. Let us know if there is any interest...



These lots are both rejects for drying/moisture issues. The top picture shows the typical reddish-brown signs of oxidative damage that is generally followed by mold. The bottom picture shows hops that were over-dried and completely disintegrating.

Hop Drying and Storage Issues

We worked all spring and summer training, pruning, weeding, watering, sweating, etc, etc for this hop crop. We spent hours hand picking, bribing with beer, food, and even paying people to help. We spread hops out on any flat surface that could be found to dry (or so we thought). We carefully bundled hops getting ready to ship for processing. They may have sat for a few days in the barn or garage. We proudly delivered our bounty to be processed and what did we find? SPOILAGE!!!!!!

Sounds like a horror story right? But the take-away lesson for this season to most small first time growers is that all the hard work throughout the season can be completely wiped away with improper drying and moreover, poor storage. I've said it once, and you'll get tired of hearing it, but there are more ways to ruin your crop after harvest than there are ways to get it right. NO SHORT CUTS. It starts with drying. And to remind everyone how important the drying process is, we're re-running Dan's article from earlier this year.

How dry is dry enough? Anything over 10% moisture content (MC) risks decomposition and potential combustion if it is tightly baled or otherwise crammed into a tight space. What was the leading cause of bale spoilage this season? Improper moisture determination. There are no short cuts here. To be absolutely sure of moisture content the oven dry test

is the only sure-fire method. See Dan's article on the following page to refresh your memory. So if folks were not using the oven dry method (American Society of Brewing Chemists Protocol) what were they using?

Moisture Meters: We've tested various models and have found that they do not come close to giving an accurate reading. Most are calibrated for grains, wood, etc...not for hops. One colleague found a meter that seemed to work but I'm not convinced.

Dermal Tactile Determination: "They feel dry..." not even worth laughing at. What does dry feel like?

Dietary Scales: On the right track here, but given that our sample size is small (about 100 grams) kitchen scales are not accurate enough for proper oven dry weight determination. Invest in a balance that has a range of about 400-600 grams with at least 2 digits after the decimal point.

Save yourself some heartache and take the time to test moisture properly. Baling moist hops will result in decomposition and damage in just a couple of hours. Even a small percentage of spoilage will disqualify the entire lot at the processor.

By James Altwies, Gorst Valley Hops

Hop Drying 101

Normally we'd be talking about when to harvest before how to dry hops, but since we've received so many questions about drying we thought we'd jump ahead and try to alleviate some of the worry concerning drying hops correctly.

From the moment the cone leaves the bine, the clock starts ticking. The high moisture content (50% to 80%) can cause the alpha acids and other flavors of the hop to oxidize. This leaves a slothful grower with a large pile of vegetative matter unfit for use in brewing. To prevent this, we must get the moisture content down to a level of 8% to 10% within 12 to 24 hours. We are not discussing wet hopping.

Drying time under most conditions should take 12 to 20 hours. If it is less than 4, you run the risk of drying too quickly, which can trap moisture in the strig. If you over-dry the cones, the bracts will fall off and the lupulin will drop away. So how do we know when to stop the drying process? Start with a known quantity of hops, say ½ cup and weigh them. This is your **wet weight** (W_w). Now take that sample and remove all the moisture to obtain the **dry weight** (W_d). This can be done by baking them in an oven or microwaving them with some silica gel desiccant. (Note: Discard this sample when finished as the silica gel could make the hops unsuitable for human consumption.)

Now using the following formula:

$M_{\%} = ((W_w - W_d) / W_w) \times 100$ where $M_{\%}$ = moisture content (%), W_w = wet weight of the sample, and W_d = weight of the sample after drying. This will give us the initial **moisture content** ($M_{\%}$) of the hops. Now we want to find the weight of a sample the same size that will give us the desired final moisture content. We'll call this final hop weight W_{final} . Rearranging the formula and solving for W_{final} , where it substitutes as our new W_w , gives us the formula:

$$W_{final} = W_d / (1 - (M_{\%}/100))$$

As an example: We want a final moisture content ($M_{\%}$) of 10%. We weigh the samples and come up with a wet weight W_w of 1.5 oz. and a dry weight of W_d 0.40 oz. This means our initial moisture content is: $M_{\%} = ((W_w - W_d) / W_w) \times 100$, so... $M_{\%} = ((1.5 - 0.40) / 1.5) \times 100 = 73.3\%$

Now we want a final moisture content of 10%. So a sample of the same volume must weigh: $W_{final} = W_d / (1 - (M_{\%}/100))$ so... $W_{final} = 0.40 / (1 - (10\%/100)) = 0.44$ oz

These calculations can be performed after the hops are loaded in the kiln. You do have 12 to 20 hours, after all.

To speed along the drying process we have two tools at our disposal, reduced relative humidity and air flow/air contact.

Reduction in relative humidity is usually accomplished by heating the air. The big U.S. hops growers usually heat the air to 140F. This is necessary when you are trying to dry a 4 foot bed of hops, but most of us don't need to do that. In fact, once you pass about 100F to 110F, many of the essential oils and other aromatic compounds in cones start to break down. So if possible, keep the temperatures cool. The other way to increase the drying rate is to increase the amount of air contacting the surface of the hops. The faster the air flow is, the more air available to come in contact with the hops. Be careful though, if the air velocity is too high it could damage the cones and shake loose the lupulin.

It is much easier to get air contacting your hops if they are spread out in a thin layer instead of trying to push air through a deep bed. Probably the easiest ways for first year growers to quickly dry their hops is to lay them out on an old screen door or something similar. If needed, use a box fan to blow air over them. Of course this takes up a lot of space. Another option is to use a tabletop food dehydrator. Just keep the temperature setting on low and check it often.

Once the harvest becomes sufficiently large, you must construct an oast. Further information on this will be highlighted in later issues of *All Hopped Up*. Keep constant air flow across the hops and temperatures low while still achieving dry hops in a reasonable amount of time. If you need further help on your oast design, feel free to contact Gorst Valley Hops for ideas or a review of your current design.

By Dan Dettmers, Gorst Valley Hops

