Fully 98% of all U.S.-produced hops are grown in the Pacific Northwest, but in recent years, researchers in the Central and Southern Plains have started looking into whether this attractive cannabis family relative could be a viable alternative crop for the region. Earn 0.5 CEUs in Crop Management by reading this article and taking the quiz at www.certifiedcropadviser.org/education/classroom/classes/705.

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Though individual hop plants are fairly easy to grow, turning the twining vines, technically classified as bines, into a commercial-scale enterprise is more challenging. The sprawling plants, which look so pretty draped over an arbor, have to be carefully timed, trained, and managed to produce sufficient quality and quantity to succeed in the brewing or medicinal market. (While most consumers associate hops with India pale ale beers, or IPAs, their antibacterial properties lend them to medicinal uses as well.)

The Pacific Northwest has key geographical features that make it ideal for hops production, but other pockets of the country are beginning to see interest blossom and successful infrastructure develop. In the last few years, hops acreage has more than doubled nationwide while becoming more geographically diverse.

A budding renaissance is under way in Ohio, for example, which caught the attention of Stacy Adams, a specialty crops expert at the University of Nebraska. He launched his own hops project five years ago, around the

Stacy Adams, specialty crops expert at the University of Nebraska, inspects hops. Photo by Craig Chandler, University of Nebraska.
time a few other states like Minnesota and Iowa were also starting exploratory programs.

“People were already growing them for fun here and there, but what we didn’t know was if there was real potential for commercial production,” he says.

Today, he oversees five test plots across the state containing eight popular cultivars. His main goal is to identify those that can best tolerate Nebraska’s highly variable climate.

“They are more sensitive to environmental factors,” he explains. “If temps are too high or winds blow too much, the numbers related to their aromatic qualities will be off, whereas another cultivar will be more consistent in spite of Nebraska’s crazy weather swings.”

He’s also monitoring their growth behavior, which reminds him a bit of asparagus. “The actual perennial plant is underground, with an underground stem structure made up of rhizomes, but when it gets going, it can grow a foot and a half a day. It’s mind-blowing how fast it grows. In the fall, after it flowers, the plant dies and puts energy reserves back into the soil for the next year, so when we harvest, we always leave a certain amount of residue,” he says.

Latitude plays an important role in hops production. Long days are vital to getting maximum growth prior to the summer solstice, at which time the shorter days trigger the plant to redirect its energies into flowering.

A second critical factor is slow modulation of temperatures. The area around Traverse City, MI, for example, is moderated by the influence of the Great Lakes, allowing hops to thrive there.

“If you get heat too early, the plants grow way too fast. It’s kind of a complex situation,” Adams explains. “You really want them to be 18 ft high when the daylength starts getting shorter, but if they grow too fast, they get all woody and out of control.”

Optimal plant length allows for sufficient growth nodes, which can then be pruned and spaced about 4 inches apart.

Excessive heat also presents a problem as the plants don’t tolerate temps above 90°F very well. As a result, one of the most promising places in Nebraska to grow hops appears to be the Western Panhandle.

“At Scottsbluff, where we have 4,000-ft elevation and 17 inches of rainfall a year, we are seeing crazy excellent growth,” Adams notes.

Vines and bines: do they pair well?

Nebraska has the longest track record experimenting with hops in the Central Plains, but several other university programs have followed suit. The University of Missouri (MU) is in the second year of its own hops project, according to MU horticulturist Jim Quinn.

“We’re not trying to be another Michigan (the largest producer outside of the Pacific Northwest with around 800 ac), but we recognize there are so many craft breweries making hop-forward beers right now,” Quinn says. “The experts in Ohio have told us if they could pick up even 10% of the acreage required to produce that beer, it would require 1,600 ac of production. That was significant to me because here in Missouri, we have a significant wine industry for the Midwest, and our wine grape production is only around 2,000 ac. It’s really about how productive will they be and what will the quality be.”

So far, MU researchers have identified three cultivars that are performing well but want to add more to the mix to ensure adequate diversity. “You really need to be growing five or six different cultivars if you want to be able to justify putting in a small acreage,” Quinn says.

Jake Mowrer, a horticulturalist at Texas A&M University, is also approaching Year 2 of a similar project with five research plots statewide. He admits Texas is far enough south that when he pitched his grant proposal he knew it was a “moonshot.”

“If we could breed for photosensitivity changes and create cultivars with more of a reproductive phase response that would really help us open up the South since we never hit 15 hours of daylight and that’s what these plants rely on to really kick things up,” he says. “We also have warmer, wetter weather in the Southeast, which makes us vulnerable to powdery mildew, so that could be a problem for growing organic hops.”

Still, Mowrer believes the potential is worth exploring. Similar to Nebraska, some of the best growing conditions could exist in the Texas Panhandle around Lubbock and Amarillo. “With a lot of crops, the oil content just seems to set in a more concentrated way up on the plateau. The cooler nights are responsible for concentrating those compounds,” he says.

“We produced nine pounds off of one Cascade plant in San Antonio in one year, which is pretty good for the South, so we know we can do this,” he adds. “But shooting for commercial-scale production right off the bat would probably be unwise. It takes time, so going for incrementally sustainable footholds in the market is probably a little smarter.”

Like Quinn, Mowrer sees a connection between vineyards and hops yards, but his idea is even more explicit: Why not package hops growing together with the state’s burgeoning wine industry?

“There’s always that couple where the guy likes beer and the woman likes wine,” he says. “We have 700 licensed wineries and 300 craft breweries and brew pubs in the state. If you have a winery, and you’ve got a half-acre
adjacent to it, why not add beer brewing too? We’ve even started talking about building a fermentation facility here on campus.”

Another option is to offer pick-your-own hops for the homebrew market. “Local homebrew enthusiasts will pay a higher premium for seasonally available (and more variable) fresh Texas hops than Coors will pay for a consistent quality, processed-out-of-state product,” he says. “That allows somebody with an acre or half-acre to make a profit while they figure out what works and what doesn’t work.”

**Brewing a viable market**

All three horticulturalists agree that brewing a viable local hops industry likely won’t hinge on consistency and high volumes but on presenting hops in a novel way that is locally driven, story-focused, and what Adams describes as “experiential.”

“I don’t think we can look at this as an independent segment of an industry. We need to put together the whole package,” Adams says.

A brewer survey conducted in Missouri this spring showed that most small breweries are interested in buying locally grown hops and would be willing to pay a 10% premium for them, Quinn says. But small brewers also strongly prefer the convenience of pelletized hops, rather than fresh hops, which can present a challenge for small growers.

“You can send off the hops and contract someone else to pelletize them,” he explains. “A pelletizer is not that expensive, but, as with anything, one needs to learn how to operate it properly. Bagging the pellets (in the right bag and sealing and labeling them with the expected information) and nitrogen flushing the bag is also a significant hurdle for small growers.”

The learning curve is steep, and that’s probably why interest has slowed a bit among would-be growers, says Katie Kreuser, now an alternative crops extension educator at the University of Nebraska who spent the previous year and a half focused on hops full time.

Back then, she had a handful of interested growers contacting her every week, often from outside the state. Now interest appears to be slowing along with the craft beer boom itself. Nationally, the market went from expanding 17 or 18% a year in 2013 to around 5% today due, in part, to more competition from other craft beverages like distilled spirits.

Even so, the nascent Nebraska industry—which Adams emphasizes is still very much in its infancy—has 27 growers, double what it was four years ago, and an active brewers guild with more than 50 members. Typically around 200 people turn out for the annual Nebraska Grower and Brewer Conference, and about 40 farmers routinely attend the University of Nebraska’s field days, of which three or four will go on to seriously pursue the crop, Kreuser estimates.

For most of these growers, hops will be a side business or diversification strategy, she adds. Fortunately, the labor demands fit well with common row crops like corn and soybeans. After the plants emerge in March or April, the first set of “bull shoots” needs to be pruned back, and the next flush has to be hand-trained, which represents the most labor-intensive part of the process until harvest, which typically happens in August or September.

Growers do have to make a sizeable upfront investment. Trellised hop yards, which require poles and cables three times higher than a vineyard, combined with the necessary starter plants, cost around $18,000/ac to install. Specialized harvesters, called hopsters, typically start at around $25,000 and go up from there.

It’s not uncommon for profits to vary widely. As Adams explains, “An average grower can produce 2,000 pounds of hops per acre and sell them for $10 a pound, so that means you’re looking at potentially a $20,000 gross income,” he says. But alter the yield or the price, and that number changes dramatically. “And unlike traditional agronomic crops, there are no federal subsidies,” he adds.

Still, the long-lived perennial plants are bringing satisfaction to farmers who have been willing to make the long-term commitment necessary to pioneer a new alternative, Kreuser says.

“It is a viable crop to grow and market, but there are some caveats,” she summarizes. “People who just jump in without doing their research are the ones who don’t last. But if you can establish your market and work hard at maintaining those relationships, it can be a really rewarding opportunity.”

See the CEU quiz on p. 10.