



EXECUTIVE BOARD PROFILE:

Jill Heath, president,
Calyx Engineers and Consultants

Calyx's top pick

Only 13% of engineers are females, according to the Society of Women Engineers. It's a different story at Cary-based Calyx, where half the leadership is made up of women. "The diversity we have at Calyx makes us better. Our men and women bring different ideas and perspectives to the table," says President Jill Heath. Calyx is one of the largest civil and environmental engineering companies in the Southeast.

The Goldsboro native joined Calyx in 1993 as a CPA consultant and rose to CFO in 2003, president in 2006 and CEO in 2008. Engineering and consulting firm NV5 Global bought Calyx for \$36 million last year. Calyx has more than 220 employees and offices in Charlotte, Atlanta, Columbus, Ga., and Rock Hill, S.C. Its high-profile projects include Raleigh's Union Station and the downtown Fayetteville Street revitalization, creating a pedestrian-friendly public space that incorporated vehicle travel.

Heath chaired the Greater Raleigh Chamber of Commerce in 2015-16 and serves on the board of the Wake Technical Community College Foundation and the YMCA of the Triangle.

What got you interested in the field of engineering?

I always say that I didn't pick engineering — engineering picked me. ... I like to think that while I may not be an engineer, I was exactly what the company needed — a financial expert — and I was lucky enough to land in an industry that builds communities and improves our way of life.

How do you think engineering firms can better recruit women?

We need to reach out to them at an early age. Our employees often visit elementary, middle and high schools to speak about engineering. We sponsor and support STEM activities. Engineering is a bright future for women. We just need to educate and encourage them early on.

What has been your major focus as president? What have been some of your proudest accomplishments?

I am blessed to work with such smart and talented people, and I

consider it my job to keep them happy at work. I want to provide them a productive and enjoyable career that supports them and their families. I want our younger employees to learn and grow in their career. It was my goal to build our firm to a point where we were attractive to larger, international firms that share our vision and offer strength and abundant opportunity. I'm so happy to say that we recently joined NV5.

What are the biggest issues facing engineering firms? How does your company stay on top of the latest developments?

There is so much competition and not enough engineers. The only way to counter that issue is to be the employer of choice. We invest in our people. We offer competitive benefits. We have a fun and nurturing culture. We encourage work/life balance, and we strive to give our employees the best tools and technology to do their job well.

CASH CROP

North Carolina is much more than its growing metropolitan areas such as Charlotte and the Triangle. It's also endless acres of cropland, pasture and timber stands.

The state's agricultural sector is open to growth of all kinds. North Carolina has long been the nation's leading sweet-potato producer. It's also a powerhouse pork producer and a leader in forestry products.

As we note in this month's edition, all that makes North Carolina a player on the world stage as an exporter. The state isn't resting, with experimental programs focused on crops from hemp to hybrid poplars. Agriculture is also an attractive field for military veterans, and educators are leaping to help those veterans find their place on the land.

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CASH CROP



North Carolina is the nation's leading sweet potato producer and exports more than \$100 million worth of the crop.

A LEADING AG EXPORTER

Sweet potatoes, tobacco, pork and wood products form N.C.'s export building blocks.

For many of the products farmed in North Carolina, if it grows, it goes. The exporting of crops, forestry and animal products makes N.C. the 11th-largest overall U.S. exporter, according to the United States Department of Agriculture.

Each year, millions of dollars' worth of goods pass through the ports of Wilmington and Morehead City destined for places such as Great Britain, China, the Netherlands, Indonesia and Belgium.

The USDA reported N.C. agricultural exports worth more than \$4.1 billion in 2014, an increase of more than 200%

since 2005, and showed agriculture supported nearly 1.3 million jobs state-wide in farming, food processing, transportation and storage.

Tobacco and sweet potatoes are top crops. As of October, the state had exported more than \$566 million in tobacco in 2018, with China and Mexico as the leading partner countries, followed by Indonesia, Switzerland and Italy.

North Carolina Sweet Potato Commission data lists N.C. as the top-producing sweet potato state since 1971, with more than half the national supply. North Carolina harvested nearly 95,000 acres of the vegetable in 2016, according to the USDA.

As of last October, the state had exported \$132.3 million worth of sweet potatoes to more than two dozen countries in 2018, outpacing the amount from the previous year by nearly \$7 million. The United Kingdom

tops the list with more than \$54 million spent on N.C. sweet potatoes in the first 10 months of 2018, followed by the Netherlands at \$31.9 million.

"You see a specific country in Europe, but then there is border trade. You see a huge amount going to Rotterdam, the Netherlands, but that is because there is a port," says Michelle Wang, an international market specialist with the North Carolina Department of Agriculture and Consumer Services. "Half of that might then be exported out of that country to Germany or Sweden."

Canada, Mexico and South America also haul in N.C. sweet potatoes and, in 2016, Singapore joined the list.

China is the biggest trade partner for forest products, which in 2017 accounted for a total international export value of \$1.6 billion and ranked in the top five commodities for both N.C. ports, according to the NCDA&CS' Clay Altizer, an international marketing specialist.



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CASH CROP

Sixty percent of the state is covered by timberland, according to the N.C. Forestry Association, at 18.1 million acres. Eighty-five percent is privately owned, with 21% controlled by industrial landowners. Forest products are marketed as wood pulp, wood products, and paper and packaging.

North Carolina exported \$480 million in wood products, with China and Vietnam the top destinations, and Canada and Mexico topped the charts as the biggest customers of N.C.'s \$325 million of paper-and-packaging products.

While hurricanes and cold temperatures provided some challenges in 2018, growers are optimistic.

Scott Sullivan's family business, Sullivan Farms, in Wilson County grows about 500 acres of sweet potatoes. He's seen the markets rise and fall.

"We've been doing it since my dad started in the 1970s. In a normal year, we harvest about 30,000 pounds, but it's down about a third now, to about 20,000 pounds," he says. "Farther south it's even worse. But the price is up, almost a little less than double the price it was last year, and it could go more."

RECOVERY TAKES EFFORT

"Farmers worked around the clock to harvest as much of their crops as they could before and after Hurricane Florence made landfall, which resulted in 60% to 80% of the crop being successfully harvested," says Kelly McIver, executive director of the North Carolina Sweet Potato Commission.

Meat products also are profitable for North Carolina. According to the North Carolina Pork Council, the state ranks second to Iowa in hog production, and

the state pork industry provides 46,000 full-time jobs. There are 2,100 pig farms in North Carolina, with 25% of the pork exported.

The council says about 10% of U.S. pork exports come from North Carolina, with Mexico and Canada the main customers followed by Japan, Korea and Hong Kong. State data shows \$366.7 in total commodities of pork exports in 2018 through October.

Wang says North Carolina is open for business worldwide and is always looking at new possibilities.

"I have been saying we need to diversify the market. We are actively looking to other markets," she says. "We basically are looking at any place we have the opportunity." ■

— Kathy Blake is a freelance writer from eastern North Carolina.

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CROPS OF THE FUTURE

N.C. scientists test everything from poplars to hemp.

North Carolina's terrain is a canvas of endless possibilities for researchers, farmers and marketers.

The North Carolina Department of Agriculture and Consumer Services is developing components for continued agribusiness success. In January, the department announced its New and Emerging Crops Program.

"North Carolina is really unique in that we have an extensive system with 18 research stations located throughout the state. We can test crops in a wide range of climates and sulfites," says Hunter Barrier, agriculture manager of horticulture at the Piedmont Research Station in Salisbury and program coordinator for the NECP.

The NECP is administered through the N.C. Bioenergy Research Initiative, part of the Research Stations Division. A \$1 million allocation from Bioenergy Research is covering bioenergy projects and emerging crops projects, with up to \$500,000 available for emerging crops initiatives, Barrier says.

North Carolina State University's Department of Forestry and Environmental Resources will use \$107,757 to fund a study of "hybrid poplar clones suitable for veneer."

The NCSU Department of Horticultural Science will use \$74,283 toward research for "optimizing floral yield of industrial hemp grown in outdoor production systems."

Another \$105,305 segment of the

allocation goes to NCSU's Department of Crop and Soil Sciences to study nitrogen and potassium rates for industrial hemp production, as growers need research-based fertility guidelines for hemp grown for CBD oil, or cannabidiol.

Also in the grant cycle, the Biotechnology Center will use \$83,931 for research on hemp fungal disease management to evaluate biological, organic and conventional fungicides on disease control, yield and CBD oil quality.

Last, the Biotechnology Center will use \$113,523 of grant money toward studying a potential market for natural food colorants. A high-yielding purple carrot variety, favorable for

extraction for food colorants, will be tested for varieties best in soil types, growing locations, and planting and harvesting periods.

A plant not included in the New and Emerging Crops Program but being tested in N.C. is stevia, whose leaves produce compounds used as artificial, calorie-free sweeteners. Stevia is used in products such as Truvia and has an annual global market value of about \$400 million.

"I'm not sure it can be considered a crop yet," says Todd Wehner, professor of horticultural science at N.C. State. "Growers can obtain plants and see their production, but I would be hesitant to say it's a crop because that implies that there are production methods and machines. But it seems promising." ■

— Kathy Blake is a freelance writer from eastern North Carolina.



North Carolina farmers may someday grow stevia, a plant whose leaves produce compounds used in sweeteners.

VETS ON THE FARM

Education programs focus on veterans with farming ambitions.

Robert Elliott is a former C-130 aircraft mechanic for the United States Marine Corps. Like any enlisted person facing the tenseness of active duty, he says, "There were some questionable moments."

Elliott retired from the military in 2011 after five years of enlisted service and 10 as a contractor for the Department of Defense. The predicament of what to do next led him to farming. "It was more therapeutic, and I realized a lot of veterans wanted what I'd found.

It can be a hard time transitioning from military to civilian," he says.

In 2015, he established The Veteran's Farm of N.C. Inc., a nonprofit assisting veterans with becoming successful farmers. The Sanford-based organization offers guidance on raising livestock and growing organic vegetables and maintains an arsenal of gear — tractors, basic farm tools, trucks and trailers — that can be checked out and returned.

"For a lot of them, it may take a few years to get squared away and transition and get to where they want to be and need to be," Elliott says.

Elliott's work became part of Fort Bragg's new Soldier to Agriculture Program, a six-week course that gives exiting military a glimpse of

farming. The first class started in July 2017 to coincide with the opening of the base's Career Resource Center. Elliott is the instructor and is a liaison between Fort Bragg and N.C. State's Agricultural Institute.

The Soldier to Agriculture class is free and does not provide credits, though some students choose to segue to N.C. State to further their education in that discipline. All Career Resource Center agriculture classes are classroom only; there is no online work or self-study.

"It's introduction-to-agriculture type stuff, what the history is, what a farm looks like, what products are based where," Elliott says. "It's about fisheries, forestry, and they learn about a variety of production models."

The class emphasizes that working a farm is unlike working a 9-to-5 business shift.

In addition to agriculture knowledge, Elliott emphasizes built-in discipline. Elliott's course also teaches that farming is not a get-rich-quick profession. Money to buy land is not a given.

Veterans can apply for a USDA loan or Farm Credit loan, which provides financial assistance to farmers, agribusinesses and farm-owned cooperatives. Nationally, Farm Credit reports 57,000 new loans in 2016 to farmers younger than 36, 74,000 new loans to those with fewer than 10 years' experience and 137,000 new loans to farms with less than \$250,000 in annual sales.

"Part of our program," Elliott says, "is trying to burst the bubble of 'Everything's going to be great, and I'm going to make a ton of money.' But it's one of the most difficult areas to succeed in. You have to make a really good decision to enter into farming." ■

— Kathy Blake is a freelance writer from eastern North Carolina.



The Veteran's Farm of N.C. is a nonprofit program helping veterans prepare for life on the farm.



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A large advertisement for the 'got to be NC AGRICULTURE' program. The background features a red barn, a field of green crops, and a basket of fresh produce including carrots and tomatoes. A large, stylized yellow banner with a black outline is centered over the image. Inside the banner, the text 'got to be NC AGRICULTURE' is displayed, with 'NC' in large yellow letters and 'AGRICULTURE' in green. Below this, a small logo shows a map of North Carolina with the text 'Goodness Grows in NC'. The text 'The official statewide identity program for products grown, raised, caught and made in our state.' is written in black. At the bottom of the banner, the website 'gottobeNC.com' is written in large white letters. In the bottom right corner, there is a circular seal of the North Carolina Department of Agriculture and Consumer Services, featuring a plow, a sheaf of wheat, and the text 'FOUNDED 1877'.

HEMP: NORTH CAROLINA'S NEW CASH CROP?

Something extraordinary happened in December 2018:

President Donald J. Trump signed into law the Agriculture Improvement Act of 2018, a.k.a. the "2018 Farm Bill." Farm bills are adopted by Congress from time to time to reauthorize and modify programs that address, among other things, commodity support, conservation, nutrition assistance, farm credit, rural development, research activities, forestry, energy, horticulture, and crop insurance.

The 2018 Farm Bill did more than that: *it legalized hemp.*

Hemp Is Legal

For years, hemp was considered a Schedule I controlled substance under the Controlled Substances Act of 1972. The reins were loosened a bit with the passage of the Agricultural Act of 2014, which authorized research institutions and state agricultural agencies to grow industrial hemp as part of a research pilot program. North Carolina then established its own pilot program and the NC Industrial Hemp Commission in 2015. Although that was a huge step forward for hemp in general, the authorizing statutes, and the rules and regulations developed as a result, were limited in nature and left major issues to speculation – like the legality of some commercial hemp activities and hemp-derived cannabidiol ("CBD"). Those legal ambiguities also largely prevented industry participants from accessing traditional banking services, insurance programs (like crop insurance for growers), and other commonplace business activities.

Now, though, hemp and hemp-derived cannabinoids, extracts, and isomers have been legalized on the Federal level. Some of its immediate effects include:

- Expansion of the legal definition of "hemp" to include all parts of the *Cannabis sativa* L. plant, "including seeds and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, with a delta-9

tetrahydrocannabinol concentration of not more than 0.3% on a dry weight basis."

- Amendment of the definition of "marijuana" under the CSA to expressly exclude "hemp" (as defined above) and to expressly carve-out of the Schedule I controlled substances list any tetrahydrocannabinols ("THC") that exist in "hemp."

- States may, individually, determine whether to retain primary regulatory authority over the production of hemp within their borders. To do so, a state must submit to the US Secretary of Agriculture its plan to monitor and regulate hemp production. Importantly, that plan must include "a procedure for testing, using post-decarboxylation or other similarly reliable methods, delta-9 tetrahydrocannabinol concentration levels of hemp produced in the state." This is consistent with the test requirements already enforced by the North Carolina Department of Agriculture & Consumer Services (which oversees testing for the current pilot program).

- "Hemp" and related products can be transported legally across state lines and states must not interfere with that transport, allowing for interstate commerce.

- "Hemp" growers can participate in crop insurance and government subsidy programs, as they are developed and implemented by the regulating authorities.

With the passage of the 2018 Farm Bill, hemp will effectively become a commodity crop for farmers and, we hope, it will be a boon for North Carolina's agricultural economy. Many of the concerns that previously faced hemp and CBD companies have been alleviated. But many regulatory concerns remain to be resolved, especially with respect to CBD.

CBD Regulations Loom

CBD represents one of the fastest growing – and, perhaps, the most controversial and commercially profitable – segments of the hemp industry today.

There is no shortage of claims about CBD's helpful properties, with common-place industry acceptance that it can be used to, among other things, alleviate inflammation and anxiety. CBD has been, and it continues to be, incorporated into a wide variety of consumer products, including lozenges, honey, and even an FDA-approved prescription medicine. But, as the legal and regulatory landscape surrounding hemp and CBD continues to develop, there remains uncertainty – at least

for now – about the legality of using hemp-derived CBD to produce food, cosmetic, and dietary supplement products.

On the same day the 2018 Farm Bill became law, the Food and Drug Administration (“FDA”) released a press issued on the matter. The FDA statement is not binding or controlling, but it does forecast the FDA’s clear intention to take an active role in regulation and enforcement for hemp and CBD products going forward.

By issuing that press release, the FDA has publicly stated that:

- It will continue to enforce the law (including the Federal Food, Drug, and Cosmetic Act, or “FD&C Act”) in an effort to protect patients, the public, and to promote the agency’s overall public health role.
- Products containing cannabis or cannabis-derived

compounds (like CBD) will be subject to the same authorities and requirements as other non-cannabis FDA regulated products.

- Hemp or hemp-derived CBD products that are “marketed with a claim of therapeutic benefit, or with any other disease claim” must be approved by the FDA before being introduced into interstate commerce.

- Hemp or hemp-derived CBD products marketed “for use in the diagnosis, cure, mitigation, treatment, or prevention of diseases” must be approved by the FDA before they are marketed for sale in the U.S.

- It is “unlawful under the FD&C Act to introduce food containing added CBD or THC into interstate commerce, or to market CBD or THC products as, or in, dietary supplements, regardless of whether the substances are hemp-derived.”



Tyler J. Russell

Tyler is a business attorney who regularly works with regulated industries – including breweries, distilleries, wineries, and hemp and cannabidoil (CBD) operations – to address permitting and licensing needs, compliance issues, grower agreements, distribution and supply chain matters, negotiations and interactions with local, state, and federal governments, and other related operational needs.

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Allen N. Trask, III

Allen is the leader of the firm’s Agribusiness Practice Group, where he coordinates the firm’s resources to address the specialized issues facing clients in the agribusiness community, such as farmland leases, corporate organization, restructuring, dissolution, and succession planning, equipment financing and leasing, environmental regulatory compliance and permitting, protection of trade secrets and intellectual property, and negotiations and interactions with local, state, and federal government. These agribusiness services encompass all aspects of hemp and cannabidiol (CBD) operations, including licensure before the North Carolina Industrial Hemp Pilot Program, liability and risk planning, sales and marketing contracts, and grower agreements.

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Informed Legal Counsel is Critical

For now, many questions remain for North Carolina’s hemp and CBD companies. Will CBD ultimately be regulated entirely as a drug? Will it be treated as an additive not subject to FDA approval? Or perhaps the specific application of CBD to a product will drive how it is treated? What about hemp flower as a food additive? We do not yet know the answers to these and the many other questions.

We urge anyone considering hemp cultivation, CBD processing, product manufacturing sales or distribution to seek legal counsel before investing significant time and money. Ward and Smith’s Agribusiness practice team can advise you as you work through these and other complex legal issues.