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COVER STORY

Myco-magic: Specialty mushrooms

As consumer interest in mushrooms grows, CEA technology has made year-round indoor specialty production a viable opportunity.

Jolene Hansen

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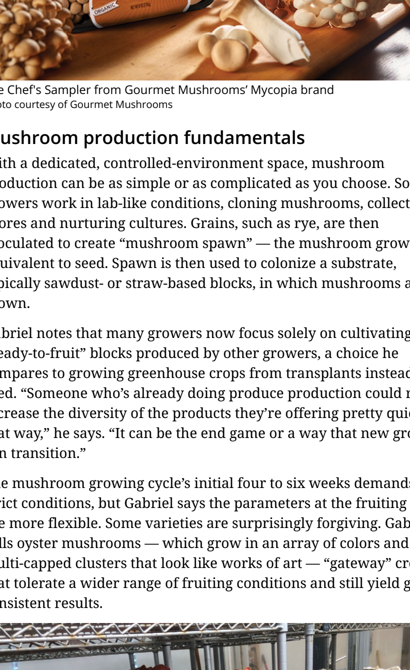

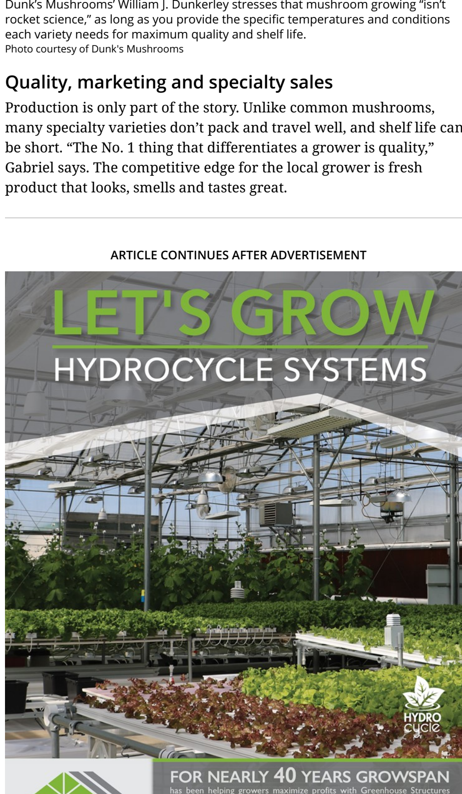

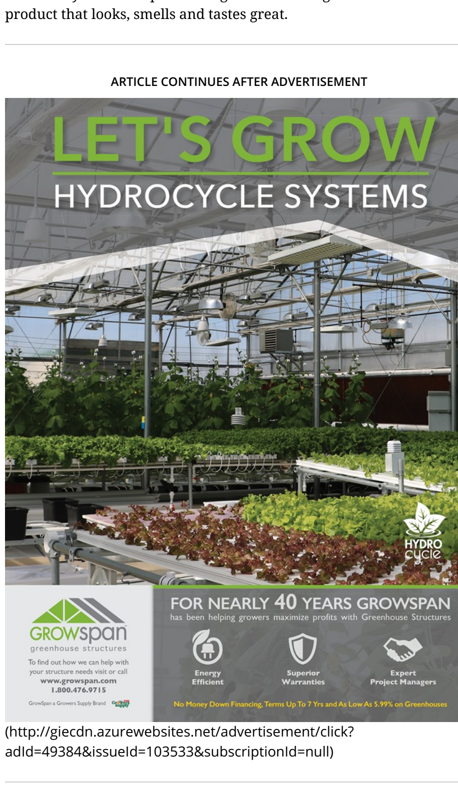

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Marketing is the second key. "The first thing is that it's not a vegetable. The value of it from a food standpoint is more like an animal protein," Gabriel says. "It has almost identical protein structure to animal proteins. Especially for vegetarian and vegan markets, it's got really good appeal as an important protein source. That's a significant selling point."

Gabriel says that quality-focused specialty growers are asking and getting $16 per pound or more — three or four times the open-market mushroom price. "People say, 'Wow, this is a beautiful food. I've never seen anything like this.' That's something growers can really use to their advantage in the market," he says.

For growers considering specialty mushrooms, Gabriel offers this: "Instead of harvesting 'x' amount of pounds, it's about harvesting 'x' amount of A-grade pounds and making sure you can capture the value."

Andrew Carter, left, and Adam DeMartino
Photo courtesy of Smallhold

Grower snapshot:

Smallhold

Brooklyn, New York

Andrew Carter, Smallhold co-founder and CEO, transitioned to mushrooms from leafy greens and herb production about two and a half years ago. At the time, Carter was consulting and doing market analyses of various U.S. cities. He kept encountering what seemed a burgeoning opportunity in the specialty mushroom space.

"It had been growing for quite some time, but I don't think we ever could have seen the wave that has happened the last couple of years," Carter says. "More and more people are exploring different types of mushrooms. More and more farms are popping up. More retailers are seeing the opportunity in expanding their offering of different types of mushrooms."

Carter and his co-founder, Smallhold COO Adam DeMartino, started growing in a shipping container transformed into a CEA-like production unit. Limited NYC farming space demanded innovation. "We needed to figure out a way to distribute the growing process and make it efficient, and then also play to the shelf life of mushrooms, which in the exotics category is very short," DeMartino says.

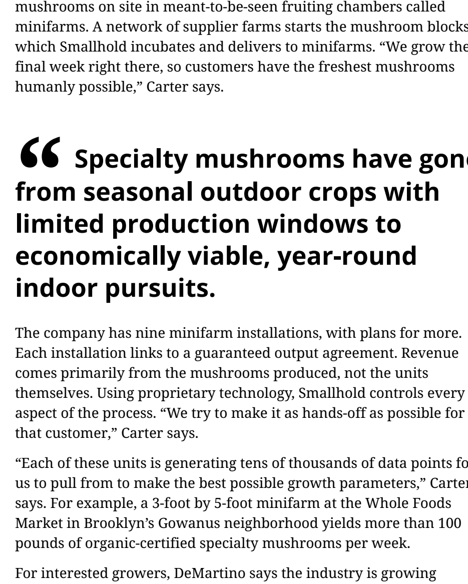
As a result, Smallhold isn't your typical farm. They work directly with their customers — restaurants, grocers, even hotels — to grow mushrooms on site in meant-to-be-seen fruiting chambers called minifarms. A network of supplier farms starts the mushroom blocks, which Smallhold incubates and delivers to minifarms. "We grow the final week right there, so customers have the freshest mushrooms humanly possible," Carter says.

> **"Specialty mushrooms have gone from seasonal outdoor crops with limited production windows to economically viable, year-round indoor pursuits.**

The company has nine minifarm installations, with plans for more. Each installation links to a guaranteed output agreement. Revenue comes primarily from the mushrooms produced, not the units themselves. Using proprietary technology, Smallhold controls every aspect of the process. "We try to make it as hands-off as possible for that customer," Carter says.

"Each of these units is generating tens of thousands of data points for us to pull from to make the best possible growth parameters," Carter says. For example, a 3-foot by 5-foot minifarm at the Whole Foods Market in Brooklyn's Gowanus neighborhood yields more than 100 pounds of organic-certified specialty mushrooms per week.

For interested growers, DeMartino says the industry is growing rapidly and demands specialized knowledge. "If you can get over those barriers, it's a really fun, awesome kind of produce to grow, especially if you're just looking for an alternate revenue stream for your farm or you're looking to just get into it," he says.



William J. "Dunk" Dunkerly
Photo courtesy of Dunk's Mushrooms

Grower snapshot:

Dunk's Mushroom Products & Foraging

Danville, New Hampshire

William J. Dunkerley, better known as "Dunk," was shaped by a legacy of living off the land and foraging in the New Hampshire woods. A chance discovery of a rare wild mushroom one day started a relationship with a local mushroom company. When a wild oyster mushroom later inspired him to try to clone it, he succeeded on his first shot and something clicked. The mushroom company and a friendly local chef were ready to buy, if he grew more.

Armed with a basic understanding of mushroom requirements, Dunkerley converted a $30 indoor greenhouse and started growing. Before long, that grew to an 8-foot by 10-foot controlled-environment room in his basement and 200 to 300 pounds of mushrooms per week. He soon faced a decision: stay a passionate part-time hobbyist or leave his job of 30 years. Dunk decided to go all in.

Today he operates a 3,000-square-foot facility, complete with storage, refrigeration and growing rooms modeled after his original basement design. Production now runs around 700 pounds per week of eight specialty varieties, including what Smallhold's Adam DeMartino describes as "hands-down the best blue oyster mushrooms I've ever seen."

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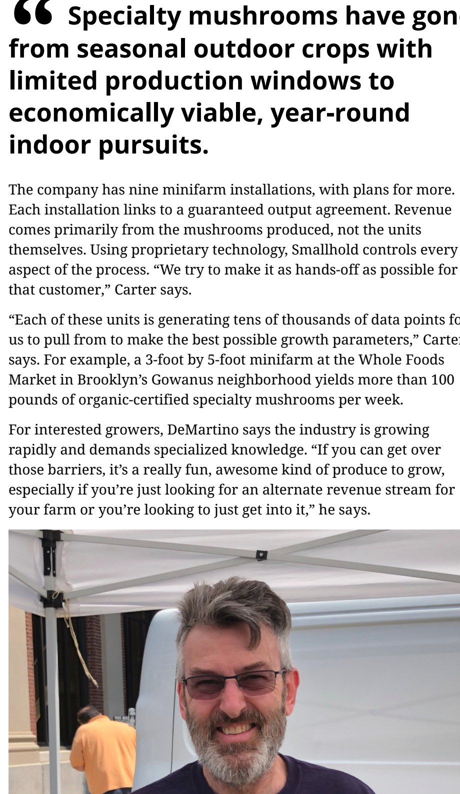

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Dunkerley stresses that mushroom growing "isn't rocket science," as long as you provide the specific temperatures and conditions each variety needs for maximum quality and shelf life. He says it's about 90% science and 10% art, like having a green thumb with plants. "Some mushrooms tolerate a wide temperature range, but there's a sweet spot," he says.

Though he initially handled growing from petri dish to produce, Dunkerley estimates he'd need three times his production space to accommodate the long colonization times of some varieties he grows. Instead, he focuses on the final stage, cultivating ready-to-fruit blocks. Some varieties fruit in less than one week, many take 10 to 14 days and some types take three weeks or more.

Restaurants, wholesalers and stores comprise Dunkerley's primary customer base. He does one farmers market and recently added twice-weekly retail hours. He harvests two times a day, every day of the year, which keeps him and two part-time employees busy.

For growers considering specialty mushrooms, Dunkerley offers this advice: "This is not get-rich-quick or easy. It's a seven-day-a-week gig."

He also emphasizes due diligence. While the specialty mushroom market has great potential, some areas are saturated with growers. "Be very cognizant of your local market conditions and what it can bear," he says.

Steve Gabriel in woods with shiitakes
Photo courtesy of Cornell Extension

Grower snapshot:

Gourmet Mushrooms (Mycopia brand)

California and Michigan

Industry pioneer David Law has been growing specialty mushrooms commercially since 1977. Gourmet's president and CEO, Law originally partnered with a U.K.-born biologist on a plan to penetrate San Francisco's Asian market with their indoor-cultivated shiitakes. The pair quickly discovered the Asian market was demanding dried mushrooms, not fresh. Undeterred, they turned to upscale restaurants with European chefs instead. Before long, Gourmet's mushrooms were bicoastal favorites.

Gourmet's early production at its California facility grew from 200 pounds per week to 3,000 pounds by the year 2000. Then, a farm expansion bumped square footage to 65,000 and weekly production rose to 20,000 pounds. With 2015 came the purchase of a Michigan farm. Gourmet's collective production jumped to 260,000 square feet and nearly 60,000 pounds of organic specialty mushrooms per week. Law expects to reach 80,000 in the next 18 months.

Grown on racks six levels high, Gourmet's California mushrooms grow in reusable bottles using a Japanese method developed in the 1960s and adopted by Gourmet in 2001. "We were the forerunner of vertical farming," Law says. In Michigan, certain varieties are grown on the multi-level racks using bagged substrate instead.

David Law, Gourmet Mushrooms
Photo courtesy of Gourmet Mushrooms

The company produces seven specialty varieties, soon to be eight, including some notoriously difficult types. About 80% of their production goes to restaurants and institutional customers through wholesale distributors. Retail packages of the Mycopia brand make up less than 20%.

Law credits the increased awareness of discerning Millennials for much of the growth in specialty mushroom sales. He compares mushrooms to restaurant wine selections of years ago. As consumers become familiar with the various distinct mushroom flavors, simple "red" or "white" won't do. He champions a "myco-cultural revolution" — a cultural attitude shift about consuming mushrooms — as consumer sophistication and specialty mushroom appreciation in America grows.

For growers interested in specialty mushrooms, Law points to European mushroom consumption, roughly double U.S. rates, and Asian mushroom consumption, more than five times U.S. rates. He also notes that China's mushroom production has grown from 30 to 40% of the global mushroom market 30 years ago to 80% today. "That tells me the potential for the rest of the world is huge," Law says. "We need 10 times the mushroom growers."

The author is a Wisconsin-based freelance writer specializing in the horticulture industry and a frequent contributor to GIE Media publications.

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