

The Taming of the Shroom

Morel Dilemma Episode 4 Script. Written and copyright Elizabeth S Gall 2016.

[Music begins]

Izzie: Welcome to Morel Dilemma, an exploration of why some mushrooms are so highly sought, some are so heavily cultivated, and some are so very dangerous. After our breaking-news lichen episode, we're back to our regular schedule. We left off in Episode 2, talking about the way that mushroom farmers can compost horse manure, inoculate with lab-cultured mushroom spawn, and raise mushrooms for your grocery store.

[Music ends]

That's how *Agaricus bisporus* is grown, the mushroom species that gives us cremini, portabella, and button mushrooms. But there's also been an increase in demand for so-called "exotic" fungi, like reishi, oyster, and enoki mushrooms. These traditionally foraged mushrooms have surged in popularity since about the 1970s, starting with the shiitake mushroom. Over the last 40 years, the *Agaricus*' hold on the mushroom market has started slipping, replaced by an increasing variety of mushrooms that were once only found in deep woods, but have become possible to farm at industrial levels, available year-round. Dozens of varieties of mushrooms have become commercially viable, and the shiitake alone has come to account for 25% of world mushroom production. So, how do you domesticate a new fungus?

[Musical tone]

Izzie: Shiitake mushrooms have been cultivated for centuries, and foraged for hundreds of years before that. The first written records of shiitake cultivation come from China in 1209. In 1796 the method came to Japan, and that was about 30 years after the first successful commercial cultivation of the button mushroom in France.

Much like *Agaricus* production, shiitake production methods remained pretty much unchanged until the twentieth century. Remember that in modern *Agaricus bisporus* farming, farmers toss inoculated grains in a tumbler with the compost to get the mycelia to spread throughout the rich organic material. Originally, techniques were much less sophisticated, and mostly involved finding patches of button mushrooms, digging up the mycelia, and replanting the mycelia in prepared patches of manure. Shiitake cultivation was pretty similar, except that instead of prepared manure patches, ripe shiitakes were placed on wet logs. Alternatively, farmers could place wet logs near trees that had naturally accumulated shiitake mushrooms. The spores from ripe shiitake would fall to the wet logs and colonize them. After fully inoculating the wet logs, the mycelia would send out mushrooms of their own. In 1930, around the

same time that the modern spawn method for button mushrooms came around, Japanese growers began to use wooden “plugs” or dowels inoculated with shiitake mycelia and placed inside holes drilled into the logs. This made inoculation of the full log more reliable, but did not significantly reduce the time investment.

Growing mushrooms on logs is incredibly inefficient and time consuming, taking about 20 years from initial inoculation to fruiting. Why do shiitake mushrooms take so much longer than button mushrooms? While *Agaricus bisporus* mycelia – button mushrooms – reach out for the decomposed materials present in compost, shiitake and many other mushrooms get their nutrients by breaking down wood. These are called wood-decay fungi, and they have a very important part in forest ecosystems. They break down the hardest parts of the wood that nothing else can eat. Those nutrients then return to the forest floor after the mushrooms die. Shiitake mushrooms, as well as oyster mushrooms, Sulphur shelf, honey mushroom, and others, are fungi that cause white rot – so called because the fungi prefer to start with the darkest molecules of the wood, so as the mycelia develop, the wood substrate gets lighter.

The wood-decaying activity of these fungi makes them great for a forest, but not so great for a mushroom farmer in a hurry. Growing shiitake mushrooms used to be a huge investment of time, money, and wood, for an uncertain payout a long time coming.

But then, in the 1970s, came a major breakthrough that made it possible to grow wood-decaying mushrooms in a fraction of the time. And in 1977, it came to the United States.

[Musical tone]

Izzie: In 1977, David Law and Malcolm Clark started a business called Gourmet Mushrooms. Its mission: to bring shiitake mushrooms to the United States, and start cultivating *other* wild mushrooms – which was, at the time, unheard of. Malcolm had been talking with Japanese Americans who wanted to bring shiitake cultivation across the Pacific, and with their help, he made contact with a very cool Japanese scientist, Dr. Yoshi.

Dr. Yoshi had realized that just because white rot fungi need to grow on wood, doesn't mean they have to grow on *solid* wood. Sawdust would provide all the same elements, but with a ton more surface area, so the fungi wouldn't have to reach as far to digest the same amount of nutrients. By supplementing the medium, Dr. Yoshi could make shiitake mushrooms grow in bags of sawdust in months, rather than years. Though it made him something of an outcast in the insular Japan of the 1970s, Dr. Yoshi had shared this idea with folks outside Japan... like Malcolm Clark.

Malcolm and David planted their flag in Sonoma County, California and started working with the sawdust process. Here's a spoiler: it worked! And for 30 years,

Gourmet Mushrooms has been a leader in bringing traditionally foraged mushrooms into year-round cultivation.

I got to talk with two current employees of Gourmet Mushrooms. Chris Bailey, the current Vice President, joined the company in 1994. Chris is also the head of cultivation at the company, which means he's elbows-deep in sawdust supplement and species culturing processes.

Justin Reyes is the manager of sales and marketing. He started out in the wine industry, actually, but considering that Gourmet Mushrooms is based in Sonoma County and how much Justin likes foraging mushrooms, it was probably inevitable that he come to the fungus business. I had really long, awesome talks with both Chris and Justin, so you'll be hearing a lot from them. Unfortunately, the recordings I got are full of weird distortions. I've switched recording programs so this won't happen in the future, but for now I recommend listening to this episode with headphones on, at low volume, for the best experience.

First things first, I asked where Gourmet Mushrooms gets their sawdust. All of their lines are grown on oak sawdust, and it has to come from somewhere. I was pleased to learn that Gourmet Mushrooms has never had to cut down a tree to grow its mushrooms. Sustainability has been a big focus right from the start. Justin told me,

Justin: We're not chopping down trees to produce the sawdust, we're working with a company that's producing products with that oak, and we're buying the rest.

Izzie: Gourmet Mushrooms is really proud of that sustainability, which is a hallmark of a lot of mushroom farming: whether horse manure, soybean pods, cocoa husks, or sawdust,

Justin: We're getting that extra use out of it, we get nutritious food out of these waste products.

Izzie: When they were just starting out, David and Malcolm used the shavings generated when wine barrels are made. You know, when a sommelier claims to taste oak in a wine, that flavor comes not from the grapes, from the wood the wine was aged in. And with all the wine produced in Sonoma County, you might think there might be enough barrel-dust to keep Gourmet Mushrooms in the black, sawdust-wise, for forever. But no.

Justin: We had to find a source that was a little more reliable, we need a larger volume than that.

Izzie: As the company expanded, their demand for sawdust outgrew even Sonoma County's barrel industry. The company switched sources, and they now use dust from a forestry mill in the Midwest, near their second farm.

But sawdust isn't the only thing the mushrooms need to grow. Each species has a personalized blend of nutrients. Chris suggested that rather than say the mushrooms grow on sawdust, say they grow on a supplemented sawdust-based medium. Justin told me that where a person might like their eggs or steak cooked a certain way, a mushroom likes its sawdust a certain way. Part of the challenge of bringing a new mushroom species into sawdust cultivation is figuring out what, besides sawdust, it likes best. This is less an issue of seasoning than it is an issue of how much of which supplements the mushroom needs to live, and prefers to live on.

Unlike in *Agaricus* cultivation, inoculated sawdust substrate is not laid out in a concrete flat. Instead, Gourmet Mushrooms puts substrate into batch-sized bottles. The bottles are stiff, so batches of inoculating substrate can be stacked directly on top of each other, as flats cannot. This is a big deal when you're producing literal tons of specialty mushrooms in a real estate market like Sonoma County. Justin says that with the rise in the wine industry, property values have increased considerably since the company began. As a result,

Justin: We really try to maximize the square footage of our farm.

Izzie: While bags can also be used to grow mushrooms from sawdust, Chris agrees that bottles are the greatest space-saving measure. And they're more efficient in other ways, too. Without adding any staff or making any other changes, Chris says,

Chris: We grew twice as many mushrooms, doubled our output overnight.

Izzie: Not only that, it's fast.

Justin: Myself included, the first time I went through, it's a little bit mind blowing how quickly they grow. From when the bottle goes into the harvest room to when it's harvested is just a matter of days.

Izzie: Here's another space-saving trick: unlike many *Agaricus* growers, who harvest multiple breaks of mushrooms, Gourmet only harvests from the first break. This means that if a bottle is taking up space in the growing chamber, it's on its way to produce its strongest possible batch of mushrooms. Even in *Agaricus* flats, the second break isn't as plentiful as the first, and the specialty species Gourmet Mushrooms produces are worth more per pound; so this rapid bottle rotation is a good move. As Justin puts it,

Justin: We could do a second harvest if we wanted to, but the mushrooms wouldn't look as nice, the yield wouldn't be as high.

Izzie: If you're thinking that ditching perfectly good substrate, still capable of producing mushrooms, after one use doesn't jive with Gourmet's mission of sustainability, I have good news. Spent-mushroom substrate, or SMS, is the term for the mycelia-filled substrate that has already been fully harvested. SMS is also a waste product of mushrooms grown in flats. Fortunately, these spent substrates are still high enough

in nutrients and organic matter to support more growth, even if it won't produce mushrooms that are up to commercial standards.

The company actually reuses the myceliated sawdust in a couple of ways. The first one helps educate new mushroom scientists at a local community college.

Justin: One of the mycologists at the farm teaches mushroom identification, and teaches a cultivation class as well. And for that class we actually put substrate, our used substrate, put some of that in the landscaping on campus there. We do get mushrooms; they don't meet the standard of what we would want to sell, but we do get mushrooms.

Izzie: This is great because students get real experience and, while the mushrooms produced in the second flush might not meet industry size standards, they're still perfect for proud students to take home.

The SMS can also be used to grow non-fungal foods. Once pasteurized and processed a bit, button mushroom SMS is commonly used in potting soil mixes. The decomposed mycelia left in the substrate provide a good, easy source of carbon, which helps the soil hold onto nitrogen more easily, which in turn reduces the amount of fertilizer that has to be applied to grow houseplants or vegetables. Similarly, Gourmet Mushrooms SMS is a bunch of supplemented sawdust with exotic wood-digesting mycelia mixed in. That's a lot of good plant-growing material. A local farm actually purchases Gourmet Mushrooms SMS.

Justin: We have a company that buys everything we produce on our California farm, and they compost it and return it to the soil.

Izzie: There's actually a waiting list for the potting soil produced from Gourmet Mushrooms' used sawdust. What's with the high demand? Well, in addition to its just being SMS, and therefore really good for plants, Gourmet Mushroom's spent sawdust is actually better than a lot of *Agaricus* SMS in some ways – especially in terms of pesticides. A lot of button mushroom farms spray their crops with pesticides or other mixtures to help reduce the risk of infection or infestation. With SMS processing, that pesticide mostly goes away, but many consumers are still more comfortable using SMS from farms that never introduced pesticides in the first place. While avoiding pesticides makes SMS, and the mushrooms themselves, more desirable to many consumers, infection is a real issue, and one that all mushroom farmers want to avoid.

Justin: The higher contamination, the lower yield, reduced productivity.

Izzie: When I asked Chris about the risk of infection in the growth chamber, where multiple lines of mushrooms are all present in various stages of growth, he echoed Justin's worries.

Chris: It can shut down a farm, for sure.

Izzie: Mites are especially bad, he told me.

Chris: They're not very picky. They'll go for anything. If you have a mite issue, wherever they land, you have a mite issue.

Izzie: in addition to eating fungi and stunting mushroom growth, they can carry mushroom diseases or "opportunistic" fungi. Opportunistic are fungi are those that take any opportunity to steal valuable nutrients away from the desired mushrooms that Gourmet is trying to grow, and they're really good at what they do.

Chris: Opportunistic fungi grow at four times the rate, to the point where it can outcompete or damage the mushrooms you're trying to grow.

Izzie: Mites are invisible to the naked eye, and they can come into the growth chamber on workers' clothes or even by hanging onto flies that make it inside. And while bottle growing maximizes square footage over bag use, it also represents to a sacrifice. Chris says that where the bags are impervious to infection after they are sterilized, the bottles aren't airtight, so even after sterilization, pests could get inside.

Nonetheless, Gourmet Mushrooms never sprays their products. With anything. Their organic certification means pesticides are out of the question, but there are other possibilities – for example, there are sprays that use garlic oil or hot pepper oil to deter bugs. Still, Chris says, they never spray their crops. In fact,

Chris: We don't have an issue with it, honestly, just because we maintain our hygienic levels pretty high.

Justin: Appropriate cleaning of tools and work areas.

Chris: Fresh water and good air.

Izzie: As well as being really careful about any perceived infection or pests.

Justin: Just making sure that we are looking for any visual cues, if we see something we'll jump right on it before it can spread.

Izzie: Chris outlined four steps that are taken if an infection is found in the growth chamber. Step one is Start over, meaning scrapping everything in the growth chamber. It doesn't matter what species it was, where it is in the chamber, or how old it is. Step two is to isolate – get the offending bugs, the opportunist, or the infected tissue away from everything else and off the farm. Step three is to clean everything, and step four is to sterilize the whole place.

Actually, Chris told me five steps, not four; he listed "clean everything" twice.

Fortunately, this stiff cleaning regimen is rarely called upon. The sterile techniques Gourmet Mushrooms employs don't let mites or diseases in easily. Also, while the bottles aren't airtight, they don't have very large openings, and once the desired

mycelia have colonized the surface of the substrate in a bottle, Chris says the substrate is basically sealed off from anything else – no place for opportunists to come in. That helps a lot, as does only harvesting one break per bottle. The longer a bottle sits out in the warm, moist air, the more chance it has to be colonized by mites or diseases.

So far this episode, Gourmet Mushrooms seems like just a fancy *Agaricus* farm: using sawdust instead of manure, bottles instead of flats, and avoiding pesticides. But what really sets Gourmet Mushrooms apart is the species of mushrooms they cultivate and sell – and how they get them. That’s coming right up.

[Music begins]

Voicemail Recording: Hello! You have reached the voicemail for the podcast Morel Dilemma. I can’t talk fungi right now, but if you leave me your name, number, and a brief message, I will get back to you as soon as possible. Thank you!

Cameron: Hi, this is Cameron from Madison, Wisconsin. Let me tell you a story about the wood mushroom. The wood mushroom’s name, loosely applied to the numerous mushrooms which grow in the woods, is sometimes used specifically as *Agaricus silvicola*, the woodland counterpart of the common field mushroom of Europe. This is a white or cream cap which smells of anise and measures up to four inches across. Additionally, a very good mushroom to snigger about. The “wood” mushroom.

[Music ends]

Izzie: I must confess that while it was really cool actually talking to real people in the industry about how mushrooms are grown, my biggest excitement from talking with Justin and Chris was finding out how new mushroom strains are domesticated. I was hoping for stories that treated mushrooms like great treasure, found in the depths of mysterious jungles and brought back under cover of night to be tested in secret.

I can hear you saying, “Woah, Izzie. Dial it back. Mushrooms are not that exciting.”

No, actually, that’s pretty much how it goes down. Remember Malcolm, the company’s cofounder who made friends with Dr. Yoshi? He is sort of the Indiana Jones of mushroom cultivation. Whether in Greece, Peru, Bali, or Nepal, Malcolm would find cool mushrooms and bring them home for culture. Once they reach the lab, the process is similar to how *Agaricus* farmers test the purity of their own spawn, only it’s much more involved, because not only do Gourmet Mushroom’s scientists have to purify their mycelia, they don’t even know how to grow them.

Take the Pompon Blanc, the first mushroom that Gourmet successfully cultured from the wild and brought to commercial levels of cultivation. (Shiitake don’t count, because Gourmet Mushrooms didn’t develop the cultivation process.) The Pompon one didn’t take any jungle tromping, because a forager working with the company

found it right in Glen Ellen, a village in Sonoma County. It must have been the most perfect mushroom Malcolm had ever seen, as Chris recounts his reaction:

Chris: Malcolm went out into the forest with his light meter and temperature recording, humidity recording meter and just sat with the mushroom for a couple of nights, just trying to get an idea of what it liked.

Izzie: Gourmet Mushrooms was particularly lucky that this first attempt at domestication was growing on oak – so they could use the same substrate they were already employing for the shiitake. After learning everything he could about the mushroom’s habitat, Malcolm brought samples back to the lab. The team messed with the supplements and other factors of the growing chamber:

Chris: Well, what’s its nutritional profile? Does it like a lot of nutrition, does it like a little? What temperature does it like?

Izzie: Chris didn’t give me specifics, but he did tell me that the Pompon growth process turned out to be very different from that used on the shiitakes. Nonetheless, after a lot of trial and error, they made it work. In 1981, the Pompon Blanc became the first newly domesticated mushroom in two hundred years. As Chris tells it, the effect was electric: chefs quickly caught on, delightedly demanding to know what was next.

They had to wait a while – over a decade, in fact. But in 1993, Malcolm made a trip to Bali. Get ready to hack through some jungle. Malcolm was visiting a farmer’s market when he was blown away by a brilliantly colored oyster mushroom – another wood decay fungus.

Chris: He saw these wild mushrooms that someone had collected and they were stunningly gorgeous, this beautiful blue, dark blue color. It was just gorgeous.

Izzie: He asked the forager where they had come from...

Chris: In whatever broken Balinese that he could.

Izzie: They took him deep into the forest, to a place where a log had fallen across a stream.

Chris: It was just covered... it was gorgeous.

Izzie: Malcolm had his equipment with him, and measured light, temperature, and humidity around the mushrooms. He bought the mushroom from the farmers who had shown it to him and took it back to his hotel room, isolating it with the simple supplies he’d brought with him, which basically amounted to a bit of alcohol and some Clorox. Chris says he put the mushroom in his suitcase, took it home,

Chris: Yeah, and it actually grew!

Izzie: If you’re not wondering why you shouldn’t quit your job to move to California and work with these people full-time, we are very different people. But it’s not all stumbling

into a shining glade full of jeweled logs. There's a lot of hard work, and hard science, that goes into domesticating a wild species. It can take years to learn what a fungus needs to survive, and what factors induce it to fruit, and how to make sure the fruit is healthy, and how to make sure that it actually tastes like something.

That means using a lot of samples, and sometimes raising different strains sourced from the same species. Take maitake as an example. It's a variety Gourmet Mushrooms currently offers, and it's also the most recent success in cultivation. Chris says when they brought the maitake into the lab, they tested 10 strains, slight variations that still belong to the same species. Of those ten strains, four never produced mushrooms, no matter what they tried. The other six differed in fruit size, growth rate, and flavor. There's no guaranteed link between any of those traits, so the fastest-growing strain may taste like nothing. And just to cover all the bases, Chris and his team always test multiple substrate recipes to see what the mushrooms might like best. Some cultivars might respond better to different supplements, and the right supplements could make a boring cultivar taste amazing. All in all, it's an exhausting process, and one that can drag on for ages.

The Velvet Pioppini mushroom, which is also currently available, took Malcolm and Chris almost a decade to domesticate.

Chris: Seven or eight years, we never could get it. We just played with it and we said "Heck with it, the yields are too low, it's not worth it, we can't get it. It's not commercially viable. We'll have to charge twenty dollars a pound for this mushroom.

Izzie: They actually abandoned it for a while, though Chris never stopped thinking about it.

Chris: It's been haunting me.

Izzie: When Chris heard about a new substrate someone else was testing, and thought to try it with the Pioppini, bam. Suddenly they were achieving commercial production levels.

Chris: Sometimes things just take from the get-go. Other times, we work and work and work at it for years.

Izzie: Even when a strain is domesticated and reaching commercial yields, Justin told me the work is never done.

Justin: We work on the strains that we work with currently. So can we get a little more consistent yield, or more consistent appearance or flavor profiles, timing – all those kind of things. Improve the quality of the mushroom, give it maybe a different mixture of food or different ratios in the recipe. So we do some of that.

Izzie: For example, they may go back to growing maitake in bags instead of bottles because that gives a larger, more impressive looking mushroom. By contrast, giving the Velvet Pioppini less space can give you longer stems and richer flavor.

Gourmet Mushrooms' team is always on the lookout for changes, because breakthroughs don't all come from the scientist side. Sometimes the mushrooms have a trick or two up their sleeves, as was the case of the clamshell mushroom. Gourmet Mushrooms currently offers two varieties of clamshells, one brown and one white. The white line was a happy accident – a couple of albino clamshell mushrooms suddenly appeared in among the rows of the brown. The Gourmet team isolated the albinos and raised them in parallel with the brown strain. Fun fact: this is also how the white button mushroom was differentiated from the brown cremini; it was a case of random albinos. I asked Chris why Gourmet Mushrooms kept the white clamshell and turned it into its own line, when it doesn't really taste any different from the brown.

Chris: What it gets down to is color. We provide the chefs with a diverse palette of colors to work with in their cuisine.

Izzie: Essentially, there are already a lot of brown mushrooms chefs can cook with. But adding a white variety with the same flavor as a brown mushroom gives the chef more wiggle room in how they present a dish that has mushrooms in it.

Chris: The white variety is really pretty, so here you go, here's another color to paint with.

Izzie: Gourmet Mushrooms' white clamshells were actually so popular internationally that a company in Japan decided to make them as well. Yes, I said 'make' – unlike Gourmet Mushrooms, the Japanese producers weren't fortunate enough for albinos to randomly appear, so, according to Chris, they applied ultraviolet radiation until they got white clamshell mushrooms, and worked from there. Ultraviolet radiation can be used to speed up the process of mutation, which is a naturally occurring process that leads to differences like the albino clamshells that sprouted in Gourmet Mushrooms' growth chamber. Don't worry – this technique doesn't make the food dangerous, and companies that use it do a lot of testing to make sure the mushrooms are still just as healthy and just as tasty. It's just a faster way to access the variation that already exists inside the mushroom DNA.

Between the variation that fungi exhibit on different substrates and chances for random mutations, you might think that an initial sample Malcolm brings back from a far-flung adventure will provide mushrooms forever. Unfortunately, that's not the case. According to Chris,

Chris: Even with the best intentions, mushrooms, as you manage them and store them over time, will decline in their vigor.

Izzie: Chris is referring to the fact that after being cultured hundreds or thousands of times, mushroom mycelia can weaken. And unfortunately, sometimes that means a decrease in fruit quality or frequency... or it can mean the mycelia stop fruiting at all. I really hate to disappoint you, but those baby blue oyster mushrooms Chris and I were gushing over earlier?

Chris: The strain is long since gone, unfortunately.

Izzie: Through too many new cultures, or just through random chance, the baby blue mycelia they were using have lost the ability to sprout mushrooms. I was majorly disappointed when I found out. I actually asked Chris if he can't just... go back to Bali and get some more. That shouldn't be too much to ask, for such a beautiful and successful mushroom, right?

Chris: Well, is that particular strain still out there? Eh, probably not.

Izzie: Basically, in the 23 years since Malcolm brought those first oysters back from Bali in his suitcase, who knows what's happened to the clearing? That log on the stream? Maybe it's been developed into a mall or a housing development. But even if it's still there, the environment has probably changed – temperature, humidity, light levels, as well as the other species in the forest living with the oyster mushroom, have probably shifted to some extent. The mushroom has been changing in response to its environment, doing its best to adapt. So even if the log is still there, and even if there are blue oyster mushrooms still growing out of it, they could be so different from the ones Malcolm took home in 1993 that they have entirely different substrate needs, or they taste completely different.

If you're crying, you're not crying alone. But that's part of the beauty of life! Every organism is constantly trying to be the best it can be, and if that mushroom needed to change to better suit its habitat, then we should let it. (Sorry if it seems like I'm laying it on too thick. I really am super sad about the blue oyster mushrooms.)

But unlike me, Gourmet Mushrooms isn't looking back. Rather than seeing a line they've lost, they see a space in the growing room that's ready for something new. And the process of domestication is getting easier all the time.

Chris: The more experience you get, and, globally, the more domestication is going on on new varieties, the more people are actually cultivating – that expanding network, that communication that has developed over the years with scientists – it gets a lot easier because you get more tips and tricks.

[Music begins]

Izzie: They've got their eyes peeled and their labs ready. Who knows what Gourmet Mushroom they'll come out with next?

[Music abruptly cuts off]

Izzie: Wait, did you really think I would talk to two people from a company that specializes in domesticating fungi without asking about morels or truffles?

Are you new here? Of course I had to ask!

I asked Chris and Justin if there were any plans for Gourmet Mushrooms to try cultivating morels at some point in the future. Their answer?

Justin: We have cultivated morels.

Chris: Yeah, we recently purchased a farm in Michigan, and with that came a general manager who is one of the authors of the first “How to Grow Morels” patent.

Justin: And we were able to successfully cultivate a species of morel there.

Izzie: They’re pulling my leg, right? I’m not an expert or anything, but I really would have thought I’d hear about that! Morels are supposed to be this unattainable treasure. Wouldn’t cultivating them make the news?

Justin: We didn’t really spread the word too much, because we’re still trying to what we want to do with it.

Izzie: Chris also downplayed it somewhat, saying the cultivation is not making waves because it’s not commercially viable right now.

Chris: We’re at an experimental level on morels.

Izzie: Still, it’s really exciting, and the team is very pleased. Chris says it’s been a long effort.

Chris: He’s been working on it for a long, long time. Twenty-five, thirty years maybe.

Izzie: I don’t feel weird telling you all that that guy has been trying to cultivate morels in bottles longer than I have been alive. That success has to feel amazing!

While some long-time customers got some pretty awesome gift baskets, Justin says there won’t be any large-scale morel sales until they’ve tested the process further and made sure it’s actually commercially viable. But I was still feeling super great. These guys were becoming more my heroes every second. Could it be that they were working on the Holy Grail, hiding a bottle-grown truffle from the world, waiting for it to become commercially viable?

I won’t hold you in suspense. The answer is no. The biggest reason is that truffles are mycorrhizal. That means they grow in symbiosis with certain trees, and *that* means,

Justin: They have to be grown with a tree.

Izzie: Sawdust just won’t cut it. The wood that truffles live on needs to be *alive*. Plus, as Justin told me,

Justin: The ones that grow locally are native species, not the ones that are sought after.

Izzie: That doesn’t mean that trufferies – truffle farms – aren’t popping up all over Sonoma County. With his background in wine, Justin sees many similarities between vineyards and trufferies, as well as their products. Grapevines and truffles grow in similar areas and their fruits have very similar culinary qualities.

Justin: Trufferies are actually comparable to vineyards. Truffles, by the time all is said and done, can be more profitable than vineyards are. Even in Sonoma County, where the vineyards' acreage goes for a premium because of how well-known the grapes are.

Izzie: I asked if either Chris or Justin would be interested in growing truffles himself.

Justin: It's something that I find very interesting and I'm hoping to personally explore a little bit further.

Chris: I see it more as my retirement income. I'll set up a truffle orchard in the next five or ten years. Then when I'm hobbling around with my cane and my dog, I'm just going to pick truffles and sell them back to Gourmet Mushrooms.

Izzie: You've heard it from the masters in the business – morels may become a lot easier to find in the next few years, but truffles will remain a wild prize for the foreseeable future. Or at least, a prize that still has to grow next to a tree and be dug out of the ground manually. At least we'll have a rising tide of exotic, newly domesticated mushrooms to hold us over. And you can contribute to this future of diverse, cultivated mushrooms! Justin told me,

Justin: Mycology is one of the few sciences where amateurs can make contributions to the field.

Izzie: And one of those contributions could be sending a particularly delightful batch of foraged mushrooms to Sonoma County for the Gourmet Mushrooms team to play with. Chris put out a specific call for North American fungi, saying that North America is an untapped landscape full of interesting, diverse and delicious mushrooms just waiting to be cultivated.

Chris: Send a mushroom box. We'll pay the shipping.

Izzie: You can find Gourmet Mushrooms' mailing address and more information at Gourmet Mushrooms' website, Mycopia.com. So many thanks to Justin and Chris for the awesome interviews. I got so much cool material that didn't even make it into this episode, so you can expect to hear back from these guys. Also thanks to Cameron for doing this episode's intermission about *Agaricus silvicola*, which is closely related to the button mushroom. I wonder if it's in the pipeline at Gourmet?

[Music begins]

Izzie: Morel Dilemma is written and produced by me, Izzie Gall. Our theme music was written and performed by John Bradley. If this show has inspired you to go foraging, please bring an expert or several guidebooks, and be extremely careful! Mushroom foraging is tricky business, and you never know if you might be allergic to something the guidebook says is fine. Chris wanted to make triple-sure that I always say this at the end of all my episodes, because when he got started with mushrooms, he went foraging, and maybe he wasn't as cautious as he should have been.

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Chris: I've probably eaten some mushrooms I shouldn't have been eating. [With] the things I know today, it's lucky that I'm around, honestly!

Izzie: Chris also asked me to remind everybody to be careful to cook all your mushrooms. The first time he had fresh shiitake mushrooms,

Chris: I was popping them like candy. Holy smokes, these are delicious.

Izzie: ...And then he gave himself an *allergy* to them. So please be very safe with your mushrooms, don't eat any you shouldn't, and don't give yourself a new allergy to something yummy. There are other ways to enjoy mushrooms. My favorite is photographs.

[Music ends]

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