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OK, fantastic. Good evening everyone. At least it's evening here in the Eastern Time zone. I'm Cindy Finneseth with the Kentucky Horticulture Council and I want to welcome you all to our webinar tonight. This is another of our series that we've been doing for cut flower growers in Kentucky, so I am going to put a little poll up before we get started.

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CF: This is really for Kentucky growers, but we know that there are regional and other nationwide growers interested in our topics, so we'd like to get a little information from you about where you're logging in from, how much experience you have, and then what kind of operation that you have. So, if you'd just take a minute to fill out those 3 poll questions, that would be great. We really appreciate it.

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CF: And while you're doing that, I'm going to go ahead and introduce our speaker just real briefly, and then I'll kind of do a little bit of housekeeping, but I think everybody is excited to have Bailey Hale joining us tonight. Farmer Bailey, he's also known as. He's going to be covering Lisianthus, talking about production for cut flower growers. But, just a little bit of housekeeping, we have a Q&A and we have the chat so you can use either one. The Q&A we'll be monitoring. The chat we'll be monitoring. We are going to hold all the questions until the end just so that we can get through the presentation. And, we know there will be a lot more questions than we can get answered, so feel free to go ahead and drop your questions in the chat or in the Q&A. We'll answer as many as we can, but what we'll do at the end is anything that we don't get to, we will export those, Bailey and his team will work on answering all those questions and then when we send out the recording link - the link to the recorded webinar - and then we'll also have a survey link, we'll include those questions in there with some other resources that are available. So, feel free to drop any questions in the chat and the Q&A and we will work on answering those when we get to the end of the webinar.

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But I want to just very quickly put the poll here and, Bailey, you can see kind of what the demographics are for our group, so most are outside Kentucky. But that's OK! Then as far as experience growing cut flowers, the majority is in the one to five year experience, and, we have several with ten or more years of experience. And then as far as kind of how people describe themselves, the majority more than, well, almost 70% are growers.

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So they're your kind of people, right? They talk your language, so I'm going to share those results real quick. I thought I had before, I apologize. Yeah, OK, awesome. So, I will close that out and I just want to say thank you so much.

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You definitely have a Kentucky connection and we're glad to have you with us tonight and giving this webinar. And I'll let you get started because everybody is here to hear you, not me. Perfect.

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BH: Alright thanks Cindy. Yeah, I was excited to get that e-mail from you. I was born in Kentucky. I've got my UK blue on. I went to UK a couple years ago. I had to stop to get a little Kentucky cheer to help me through the evening here, so this would be fun even though I see a lot of people aren't from Kentucky.

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Great news is Lisianthus is really adaptable. You can grow it all over the place. Let's dive in. Let me get to my presentation here. And I'll talk at you. Make sure you leave lots of questions. I like questions. We can talk about anything you want afterwards, particularly Lisianthus. All right.

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BH: Can someone confirm that they see this?

CF: Yes, it looks great.

BH: OK, all right, I'm Bailey Hale. I am also known as Farmer Bailey. I'll tell you how that kind of came to be.

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You also may know of us through our other farm, Ardelia Farm and Company, it's called. So, we started Ardelia Farm in 2014. Because I did go to University of Kentucky, graduated uh, well, I graduated in 2000. I won't say anything about Cindy.

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I worked as a floral designer in Philadelphia for more than a decade, and then I got the urge to farm so we farmed in New York state for a bit and then we moved up in the northeast corner of Vermont called the Northeast Kingdom. Very close to Canada. Very cold, not unheard of to see -35 up there, where we ended up, we found out that sweet peas did really well for us. As well as, you know, we did bits of other things.

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There's my husband, Thomas, in our herbaceous perennial field. You see even things like astilbe do fine out in the full sun because it is so cool and lots of moisture usually.

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There was our woody field. You might notice me speaking in the past tense, because we just sold this farm last week and I can tell you more about that later. But sweet peas were the main focus.

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You see our tunnels. We had about a half acre in tunnel production. We would grow many thousands of sweet peas each year. For a while, we were shipping to the wholesale market in New York City as well as supplying mainly one local florist. I happen to be in her house right now because she has good Wi-Fi.

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But we more recently have been producing sweet pea seed, which we will continue to do after we move to Portugal in a couple of weeks. But you see what a cool climate will get you in terms of sweet peas. Just big flowers, long stems. Really hard to do outside of a place without those cool summers. So, we just grew a whole range of stuff.

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Here we have stock and snapdragons and all kinds of woody plants, perennials, Veronica. You name it, I've tried to grow it. But Lisianthus is what we're here to talk about tonight.

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This was maybe my first attempt at Lisianthus and you see it worked out pretty well. So, you know what's so great about it? It lasts a really long time. It can last two or three weeks. That's out of the cooler. It'll last, you know, even if you keep it in the cooler two weeks, it'll probably last another. Keep it in the cooler. Rather, it'll last two weeks when you take it out, so that's great and so many flowers just don't have that kind of staying power. It lasts really well out of water, if you've ever grown it, you know it's kind of succulent, so it's really good for doing arches or doing, you know, personal flowers, those boutonnieres and corsages. Just holds up really, really nicely out of water. And there's not a lot of flowers that do that. It does have a really great rose shape that was sort of the initial selling point for lisianthus. It's an annual. So unlike roses, you don't have to grow, you know, your rose bushes for years before you harvest. You can plant one year and harvest that same year. An increasingly wide range of colors, shapes and sizes.

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Another thing I love about it has a really long harvest window, so you don't have to cut it today. You can cut it next week. You can probably cut it in two weeks. You might trim off some dead flowers, but they're going to keep opening new buds, so I don't think like a tulip or a lily you have to cut that on the day it is ready and that's just not the case with lisianthus.

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So, this is the series that launched this whole thing. This is the Roseanne series. Now, when I was a floral designer, I was buying these in from Holland, from Japan. But for some reason, we couldn't get them in the US and I didn't understand why. And I talked to a number of brokers and suppliers and everyone just told me, no. Well if you tell me no, that usually just gets me kind of excited and I want to find out why you're telling me no. Well, theirs wasn't - they didn't understand the need for these. They didn't understand how many people were interested in these newer, more interesting varieties. So, I contacted Gro'n Sell.

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They're a plug grower in eastern Pennsylvania and they agreed to grow just one year, just kind of a group order for me and some friends, mostly that I met on Facebook, and other growers through the ASCFG. I'm sure I'll talk about that organization in a bit as well. It turned out to be their biggest order that year. And then afterwards people thought that I knew something they didn't, so I kept getting all kinds of requests for new products. So that's how we launched Farmer Bailey.

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I thought it was gonna be a one-year thing and now it's my full time job and I've got three people helping me and I feel like we're just getting started supplying the small- to medium- scale American cut flower grower. I really, really enjoy helping you all learn and also enjoy finding new flowers for you. So what we do is, we sell plugs.

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We'll talk a little bit about the production of lisianthus. There is a reason - other than that it's my business - that I think you should be growing lisianthus from plugs.

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Yeah, this is another. This is the chroma series, one of the first one of my first years with them. Umm, yeah, why? Why wouldn't you want to grow that? I mean, it's so versatile.

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So, when I think of any, growing any flower, I go back to the wild. The wild version, that tells you so much about what that plant wants to succeed. I got these photos from [wildflower.org](http://wildflower.org). That's the Ladybird Johnson Wildflower Center.

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So, the native range of Lisianthus. Eustoma is the botanical name. Although lisianthus sounds like a botanical name. They generally grow mainly in the central part of the US. South Central—Alabama, Arkansas, Arizona - you can read the states there - into Mexico. I think there's even one species or subspecies that goes into the Caribbean that tells you they really don't mind heat at all. They are very well-suited to being grown in Kentucky. Usually in the moist prairies and along streamsides that might get dry in the summer, but they put down really deep roots so they can always find that moisture in their native environment. Also, slightly alkaline.

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That's great for you Kentucky growers with your limestone soils. And this is really a new crop. Only in the late mid- 80s did the breeders kind of find this. A lot of the early breeding happened in Florida and then I'll show you how far it's come in just a really short time.

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Let me show you some different groups of lisianthus that come in a lot of different shapes and styles. Some of the first ones on the market were these kind of doubles and semi doubles, usually with an open center. You know series like Arena, ABC, Echo, Mariachi, Super Magic. These are still series, still available. The breeders are always improving them and coming in a wider and wider range of colors and bloom groups.

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Kind of the newest and maybe the most popular types, come into the market now with all the fringe types. These will have, you know, 3-4 inch flowers. Series like Voyage, Corelli, Celeb, Megalo. The

Japanese have really brought this type of breeding to the rest of the world, despite it being an American wildflower. The Japanese growers are really doing the best in doing the most with this. They have the reputation for being more finicky.

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The only thing I recommend is maybe don't grow these outside. These are probably best in tunnels. Those big ruffly flowers can just take on a lot of water if you have live in a rainy place. But if you live in a dry place, they would probably do just fine outside. Just use some extra support netting.

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There's some more. These are both voyage series. There's the blue and the champagne. I believe these are both celebs, so Celeb misty pink. And one of the Celeb whites. There's a bunch of different whites, and they'll look pretty white to me.

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Okay these rose types sometimes look a little bit like ranunculus too. They've been bred for their, you know, rounded petals. So, Rosita, Chroma, Erosa, they're all great.

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And here they are in a couple of colors. Sorry, that photo quality is not the best, but you get the idea. It's really pleasing. They tend to be slightly smaller flowers, but you get more flowers on the stem when you start. There's kind of a trade-off. The bigger the flower, maybe you get slightly fewer flowers per stem, but, anyway, they're all really worthwhile.

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And there are some single petaled ones. The wild ones are single petaled, but they've started breeding these ruffled single petals and all different colors here. This is Falda on the right. There's a new one called Vivianna. It's quite, very like, very similar to the wild type, but also comes in a pink and a white. These are small one-inch flowers, but you get 30 or 40 flowers per stem, so it's just really an interest in a new look in lisianthus.

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This is the Solo series. Sorry, that's a little bit blurry, but you get the idea.

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And then there's an increasing number of novelties. Roseanne that I mentioned earlier is in the browns, series of browns and greens and dark purples. The one on the right is called Little Summer. You know one-inch small flowers, but a lot of them. The Blini is really small. Kind of short, but it's really cute. They look just like perfect little Rosebuds. So, they're really great for boutonniere work especially.

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We get a lot of questions about the bloom groups so you'll see them listed mostly 1, 2, 3, and 4. Don't see too many zeros, but every now and then you'll find one listed as zero. So interplanted together,

group 1 will flower 1st and then 2 and then 3 and then 4. To be more precise, it's a really a complex equation of temperature, day length, and light intensity. So, it's about the maturity of the plant as to when that plant will initiate buds.

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So, if you plant one out in the middle of summer, it's going to have so much light and such long days it's going to want to flower immediately, and it might flower on a really short stem. So, group 1s I would get those planted, you know, early very early in the season. The others are a little more adjustable. You can plant them, well, as long as your soil is a little bit cool. We'll get into proper planting time in just a moment.

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OK, so lisianthus has a bad reputation for being difficult, but it's really only difficult when you are growing it from seed. Growing in your house, under lights is just not going to work. I mean, it might work for some people if you have really strong lights and you're just really, a careful waterer, or you never give them a bad day in their lives. But, if you do give them a bad day, you're going to set them back probably for a week. So, they already take 12 weeks to grow under perfect conditions. That's just 12 weeks to produce a tiny little plug and if you're giving them, you know, subpar conditions, you're looking at 14 or 16 weeks that you have to tend to this thing. Now, being in Vermont, I like to go where it's sunny in the winter time.

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If I'm starting something in December that I have to keep an eye on until March or April, well, that really cuts into my travel time. So that's when I first started growing plugs. I also realized just how much better the end result was when I got a plug that had been grown under just perfect conditions. So, that said, I want you to try to grow these from seed. Yes, I am in the plug business, but when you grow them from seed, you'll understand the value of a plug. Let's say most growers order plugs, of any size.

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I was just in Holland last week. There's a grower that grows 60 million stems a week. I'm sorry, per year 100 or 1.5 million a week, 60 million per year, and they are contracting their seedlings to a plug grower because even they don't have the skills and the bandwidth to produce a good plug.

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So, this is at Gro 'n Sell. That's the facility that I work with. You can't quite see anything in there because of the fog. But on the right, you'll see all those labels on the trays. So that's a really, just perfect germination chamber. The humidity stays at 100%. The temperature is perfect all the time. That's really the first step - just keeping your humidity high.

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And then after about 10 days, or two weeks, you see a little sprout like this. So, two weeks. You know, think about a sunflower, think about a zinnia. By that point you're already getting true leaves, but you're lucky if you've got just those two first cotyledons after even a couple weeks in that germination chamber. From there, they move out into the greenhouse.

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You know you see the overhead lights there. Those are high pressure sodium lights. They've since moved on to an LED system. That's really keeping an eye on the natural light outside and supplementing light. The second it needs more light, those lights kick on. So, you know that's the beauty of a modern, high-tech greenhouse, it just keeps the heat correct, the humidity correct, the light correct at all times. You can't quite tell, but at the other end there's a boom sprayer that's irrigating at just the moment that plug starts to dry out. That's also where the fertility comes from. And then look to the right - that's probably about four weeks later, you start to see - you can actually start seeing the green. You know on the left, they have all germinated and sprouted, but they're just so tiny you can't see them yet.

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Yeah, these are all lisianthus heading out to Farmer Bailey customers all over the country. So, thank you all for your support. So, this is really what your plugs should be looking like when they arrive. If you are trying to grow your own at home, or if you are growing your own - I don't want to say you can't - this is about what they should look like when you are ready to transplant. And, if they aren't looking like this, keep trying, but maybe also try a tray or two of plugs and see if the result is different in the end.

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Also, keep in mind the costs of that seed. That seed is really expensive. That's part of why plugs are expensive, and if you're only getting a 30 or 40% success rate when you grow your own, just think about the actual costs per plug that you know what it's costing you, because you might be better off purchasing plugs.

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Right. So, Gro 'N Sell ships in these boxes. Each box has three trays in it. You can mix other varieties. It doesn't just have to be lisianthus, but it's always a fun day when these show up in your driveway or in your greenhouse. If you live near Gro 'N Sell, you can also go pick up plants yourself.

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This is one of the trips I made down. Still didn't have enough room even though I brought a whole car. Also, if you order more than 30 trays at a time, you can get pallet delivery and that's great because pallets don't tip over in transit. You see how nice each of those plants looks after. I think these were delivered in Michigan from Pennsylvania, so if it's more than 30 trays, you qualify for this type of shipping. Ask around - other people in your own area if you can maybe combine your orders together. We can always just merge those orders so they can come on a pallet and then you really reduce that risk of them getting messed up in transit.

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Right, so that's kind of how the plugs are produced. So, when should you transplant these things? Well, if you're growing in a high tunnel, you can go six or eight weeks before your last frost in the springtime. If planting outside, I would maybe move that to two or four weeks before the last frost. They can take a frost. They don't mind it a little cool to start with. Down to 20 is OK as long as they are in the ground. Don't leave your tray of plugs outside if it's going to be 20 degrees because the roots are very vulnerable

when they're sitting on top of the ground. So, in the soil, they're really insulated. They're going to be fine. You know, put a piece of frost cloth over there if you're going to have a cold snap. They'll be fine. It'll just help you help you sleep a little better at night.

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So, they need two or three weeks of cool soil at the time of transplant to avoid rosetting. So, if you plant – and let me define cool, I would say 55 or below. So you know tomatoes and zinnias, you might want to plant 55 and above. Plant these first, when the soil is still cool, you know, from late winter. If you plant them into hot soil they will rosette, so they're you know they're from southern and southwestern places. If they sense it's getting really hot, they decide that they're not going to flower this year. They're just going to make a little rosette of leaves, and they're going to wait until next year, and that's really not what you want if you're running a commercial cut flower farm.

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Now those of us who have been growing way up north in Vermont, and you know, Minnesota, the Northern Tier, you can transplant as late as July, and then you'll have blooms in October. But use those groups 3 and 4 because they won't respond to that long day length as quickly as the groups 1 and 2. Not many people are, especially in Kentucky, you can ignore this part. A friend of mine planted some in July in Tennessee and every one of them rosetted. It wasn't good for her.

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OK, the main diseases. Fusarium and root rots of various sorts are the biggest issue, and there's a lot of different root rots. While I'm on that topic, if you ever see a disease plant and you're a production grower, get that plant to your university plant pathologist. It's usually free or low cost. Don't go to Facebook and ask a stranger in another place what that disease is. They're not going to know, and a lot of things have very similar symptoms. Send it to the lab. Maybe you pay \$10.00, but then you understand what you're dealing with and you're going to know how to treat it. We get lots of lots of questions all the time about diseases and my first thing is, here's my hunch, but also go get that tested. It'll pay for itself tenfold.

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Now when you're planting, because of Fusarium, you might want to pre-treat with a fungicide or biofungicide. Something that's labeled for, you know, drenching the soil. The biofungicides are, you know, they're an organic product, kind of. They have a symbiotic relationship with the roots and they actually kind of create a living protective layer around the root and then grow with the root. So, things like RootShield and Actinovate can actually be used. You might, you know, soak the trays on arrival and Actinovate and then soak in one more time and RootShield before you plant. A similar product to Actinovate is PreStop, then RootShield. They'll give you much better results than not treating if you have problems with these fungi.

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The traditional way of getting rid of those soil fungi would be steaming your soil. Most people don't have that capability, it's costly. It's a lot of big, heavy equipment. The chemicals that were previously used to sterilize soil are pretty much outlawed because they're pretty toxic, so, you know there are



some studies going on getting back into soil steaming. We just saw it - saw soil steaming - in Holland last week. It's still very much in play, but generally only on a really large scale. With all you know the pathogens you want to rotate your crops. Don't plant up in the same place every year. Fusarium is probably already on your property. It's quite ubiquitous, so if you experience it, don't freak out, but just know that you're going to have to deal with that in the future.

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You may also see botrytis. That'll spot your petals. Botrytis is also an issue of post-harvest. And, really just related to being too wet for too long, so botrytis is one of the reasons why it's better to grow in a tunnel because it keeps the rain and the dew off of your plants.

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Okay, this is kind of a bad picture. But you can see the plant in the middle. It looks brown. Looks like it died, looks like maybe it didn't get enough water. The real reason - the real thing happening there - is Fusarium has attacked its roots. It can no longer drink because the roots are not functioning. So, I would get in there. I would pull that plant out. I would also pull around - pull out those other eight plants near that plant because it may have already spread to those. It's a great idea to keep a little buffer around. You know, if you see if you see a diseased plant, pull it out, put it in the trash. Do not compost it. And then also just go in and do a little firewall by, you know, ripping out some other plants.

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Another little trick I've learned, don't put your plug tray on the ground when it arrives. It's coming from a sterile greenhouse, so you should put it on a bench or on a clean surface, you know, until you're absolutely ready to transplant, because you can even on the ground in your driveway, you can pick up fusarium on the bottom of your plug tray and you'll start seeing plugs drop off before you even plant them.

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Sakata is one of the main major breeders of lisianthus in Japan. They have an office in California as well, but Voyage, Roseanne, Rosita, a lot of the varieties we rely on come from Sakata and have an excellent tutorial. If you do a Google search for Sakata Culture Sheet or Sakata production tutorial, you'll find a really in-depth document that I recommend you check out.

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OK, here's a picture of what rosetting looks like. If you see something that looks like it's not going to grow upwards and you're just getting a rosette of leaves, that is probably rosetted. Now if you are in a place like parts of Kentucky, maybe Zone 7 and warmer that might live through one year and bloom the following year, but it's tying up a lot of space, probably in your high tunnel. So just remember to plant in the spring. Plant into cool soil and you won't really have this problem. I don't see it very often at all. If you are having a having trouble, you know, use a silver or white mulch that reflects, you know, a lot of extra sunlight helps keep your soil cool, that that can help. You can also put some shade over those transplants. You know that can help - shade cloth, it could be frost cloth at planting time just to keep them a little cooler at the time of transplant. It's really only at transplant that they are susceptible to rosetting.

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All right, some people like to bump up their plugs into a bigger cell before they go in the field. I do this in Vermont just because usually we're waiting for snow to melt and we want something to do. It also just gives me a bigger, easier to handle transplant a little later in the season. So, I have a 50 or 72 cell tray on hand. It does add to your expense. You're going to pay for labor. You're going to pay for soil and your greenhouse space now. 128 and 216's - those are both sizes of plug trays that just tells you how many plugs are in that tray. So, think about it. The lower number is going to have bigger plugs. The higher number smaller plugs. They are big enough to go right into the ground, but if you just want to plant a bigger transplant, just pop them in a bigger tray. Or, if for something, you know, if something changes in your world, maybe your ground hasn't completely thawed, maybe your employees haven't shown up yet. Don't hold your lisianthus in a tray. They're really prone to getting root bound, so go on and put them in a bigger tray.

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Also if you keep some 50s or 72s on hand in case your plugs come out of their tray in transit, it does happen. It's not the end of the world. The plant is fine, but you just want to put that in a bigger cell on arrival. You'll never squeeze it back into that small cell.

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In terms of spacing, I like 8 plants per square foot, so if you're using the standard support netting that we can get in the US, it was about 6 inch by 6 inch squares. And that's two plants per square, so I kind of stagger them within that square. Not very complicated. The wider you space them, the larger your plants will be.

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Overhead water them for at least two weeks after you plant. Now you see my drip tape there. The drip tape is only for later, once that plant has started to grow. That plug is so small the roots can't always reach the water zone. You know when you run your drip tape, soil right below the drip tape is nice and moist, but even an inch or two on either side it might be completely dry. Now that has to do with your soil structure and your soil type, but overhead water for your first two weeks.

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Now you can pinch once that thing has started to grow. Maybe you want 8 leaves before you pinch out the tip. I don't pinch, but if you do pinch you'll get branching. That will give you more and smaller stems. If you do not pinch you will get fewer but larger stems. So, it really depends on your market. If you sell a lot of stuff in Mason jars or jelly jars and a short stem is fine for you, you'll probably make more money per square foot by pinching your plants. But, if you're selling to a premium florist market, you might want to not pinch it so you can get that full long stem.

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I use two layers of support netting. Lisianthus can get very tall. They get very heavy when those flowers are all open. Some people tell me they don't use netting at all, and I think they are not to be trusted, but

if you're getting by with no netting, good for you. I always need at least two layers, and even then I still have trouble sometimes with them being too big and heavy.

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So, I had the fortune of going to Japan in 2019. This is, well, this is my production in Vermont, but this is something they do in Japan. They leave an open space down the middle of the rows. That helps airflow down the middle. Now with all fungal diseases, airflow is key. So, get some get those horizontal airflow fans going, but also leave a little room between your plants. It's because the closer you plant together, then the more chance there is that, you know, some pathogens are going to get established in there.

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I also, when I'm planting, I leave a 6 inch gap between each variety. It helps me keep my varieties straight. It also just gives me one more little firewall in case I get Fusarium ripping down a bed. There's a kind of a natural stopping point. And, I will say that once I started doing this my Fusarium losses have been much lower.

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And, this is actually in Japan. See how neat and tidy they do everything. Their structures are not elaborate or fancy. I'll show you a couple slides from Holland in a moment. The Japanese are just very skilled at using very basic equipment. Something really inspirational the way they grow things there.

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Right, another thing the Japanese will do is remove buds. So, if you know, any plant really. If you have 10 buds and you remove half of them, those remaining five are going to be bigger in the end because you're not putting all the resources into all the buds, so regardless of your approach, that first flower will not be useful by the time the next layer of buds is open. So generally you see one flower open and then maybe 10 days later you'll see four flowers open. Don't cut it when that first flower opens. If anything, pinch that flower out or go pinch. Pinch it when you first see that bud and let those resources continue to the later buds. The Japanese will also pinch out the very tips of their lisianthus so you know in this case I've grown this stem in the Japanese style, but I've got four big flowers and then I've got three or four buds that will probably go on and open in the base, so just it's a lot of labor. Most people aren't going to do this, but at the very least pinch out your first bud.

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Now again, if you have a market for really short stems, you can let that first flower open, cut it out, use it. You know, for a corsage or boutonniere and then harvest your stem later when you have at least three flowers open. Alright, talked about removing that first bud. It saves resources.

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I think maybe I'm just repeating what I just said. So, when that second tier of flowers are fully open and the third tier when those buds are full and about to open, that's when you want to harvest. Now, that said, if you don't get around to harvesting or you don't have a sale, you know you don't have a customer that week, you can probably leave it another week and wait until you might trim off some dead flowers, but Lisianthus will just keep putting out buds, so it's really one of the things I love most about them.

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Uhm, really nothing special in terms of post-harvest treatment. Just a holding solution in your cooler. Something like a Chrysal #2. That is more than sufficient. The stems are clean, they don't foul the water quickly, they're just kind of a model cut flower in my opinion.

00:33:53

OK. I get a lot of questions about can you grow organic plugs? Organic, you know, or are there organic seeds? And the answer is no, but let me tell you why, so the majority of the seed is produced in Japan. And I know that if you can't find organic seed, you can use raw seed. Well, most of that seed coming from Japan is already pelleted by the time it gets to the US. The people who make the pellet, the pelleting technology, they will not tell you what's in it. So, without that disclosure, we can never get that certified as organic. Now, we could theoretically get raw seed from Japan. But then we'd have to have that pelleted with an organic certified pellet in the US, and you're looking at 50 to 100,000 seeds per variety. The next question is you'd have to find an organic plug grower. I only know of one who is sort of organic. But they, well, probably would not meet the requirements of organic certifiers. You know, to further compound that, it can be difficult to communicate with Japan because of the language barrier. So, for them to pull seed out of their stream, you know to ship it raw to be pelleted in the US. It's just a lot of steps that they're not really interested in, and also the worldwide demand is already outstripping supply.

00:35:20

So like I said, these growers in Holland are producing 60 million stems per farm, and there's dozens of similar farms. Not to mention, you know the growers in the rest of the world, so they really don't, I'm not saying they don't care, but their stuff is sold already, it just makes more work for them without really any more profit. So, I encourage you to start breeding organic lisianthus and growing organic plugs and let me know when they're ready and I'd be happy to sell them for you.

00:35:49

Alright, so this is last week. I'm just going to breeze through these.

00:35:53

These are Lisianthus in the Westlands, Netherlands. So, they grow them in I think about 1-meter beds. These greenhouses, you're looking at a 500 foot bed on this side. There's an identical one behind me. Everything is kept at about 80 degrees. They grow them really fast. Really warm, really humid. They have LED lights up there. Like I said, they're picking 1.5 million stems per week. It's all super, super automated. I will say our flower quality in the US tends to be a little bit better, growing under natural light. The plants just have more resources. We give them wider spacing than they do in Holland, so it's slightly different product, but just really fascinating to see how they're doing it.

00:36:40

I think that's all the slides I have for you at the moment. But I would guarantee you all have some questions. Let me get out of my screen share here. All right.

00:37:02

Alexis Sheffield: Alright, Bailey.

BH: There's me.

00:37:04

AS: There's you! We've been monitoring the chat and just kind of coming up with ones that seemed like everybody had similar questions, so one was about succession planting to kind of extend that bloom time. You had mentioned already bloom group, but there were a couple people who said that bloom group didn't seem to really matter to them, is there another way extend the season?

00:37:30

BH: So, the trick there is you have to get them in the ground before your soil gets hot. So you don't have a lot of time to succession too many of them, so maybe you plant your groups 1 and 2 late winter as early as you can and then you might plant some more 1s and 2s a little later along with some 3s and 4s. And then kind of as a last-ditch effort around your last frost, try some 3s and 4s and, you know, give them some shade. Give them some protection, and, it really just comes down to that. Kentucky is hard because it - you have really cold winters then you get hot really fast in the springtime. I remember that from my years in college and from growing plants there. It's not impossible.

00:38:17

So the other thing I didn't talk about because in Vermont we have a really we almost never get a second bloom on lisianthus but, y'all in Kentucky, when you cut them back often they will regenerate and grow a whole new set of flowers, they'll be a little smaller than your first cut, but you know, just cut them right down to you know one or two inches and let them go. That's another way to stagger your harvests. Some people even get 3 flushes. I think that's a bit unusual, I think you're really lucky if you do that, but I've heard of it. I've never personally seen it myself. That's, you know, those are the only ways I can think of to extend your harvest, especially in a hot summer place.

00:38:56

AS: Awesome, can you talk to us a little bit about feeding, especially for in Kentucky where we can get that second flush. You know, feeding them to get a good first bloom and then the feed you know for the 2nd rounds.

00:39:10

BH: My advice is to feed them. I think there's a lot of people who, especially organic growers, just kind of plan that like I'm not going to use chemicals, so they don't get fed. Now, if anything you've got to work harder to get you know, amend your soil in the spring, make sure you got a, you know, a lot of great compost, use that. Use your fish emulsion and your seaweed, whatever it is you're using. If you're using conventional food right after you cut, and you if you're going for that second bloom, that's a great time to give him a nice boost and nitrogen to get that vegetative growth coming back. You know nitrogen produces leaves generally, and it's usually the nutrient that's in shortest supply. But they're really not picky as long as you have just kind of a, you know, a general all-purpose amount of fertilizer in the soil. Not the heaviest feeders, but they do appreciate constant fertility.

00:40:03

AS: Awesome, now we had lots of questions about overwintering, and both overwintering in the field in zones such as Kentucky that are around, you know, anywhere from 5 to 7 and then also hoophouse, whether or not you know putting them in in the fall, is that worth it? Should you do it? That sort of stuff.

00:40:24

BH: Great question. Yeah, I get that a lot. I don't personally see an advantage to planting in the fall. Now if you happen to, if you know you're on really well-drained soil and maybe you're in a zone 7, you can give them a little extra protection, give it a try. I think you're going to have about the same results. They're just such slow growers. If you put them in in October, November, they're going to look about the same in March. You know they will put out some roots, but if you have a place with poor drainage or they're going to be sitting in water, you're just asking for fungal problems to show up over winter. I know Lisa Mason Ziegler lists them as cool flowers in her book. I don't argue that, but I think the risk might be a little too great considering how expensive the plugs can be. Now if you already have the flower or the plant going and it's doing great, they seem happy, and you're in a 6 to 7 Zone you can get a little protection. Keep them mostly above 20, leave them in place. They'll flower again for you next year, but you'll probably start seeing some holes, not every one of them is going to make it. You have to sort of evaluate is it worth it to have half of them dead, but half are alive? Because then you have these kind of awkward holes in your bed. It's definitely worth trying. I don't know a lot of people who are reliably overwintering year after year. It's a great idea. I mean they are perennials in the wild, but they're short-lived perennials. They may only live two or three years in the wild. Look, it'd be great if you if you can do that. That's wonderful. You're in a special location.

00:41:59

AS: Awesome, so we've had lots of people who are commenting that they're in a warm climate. Some of them are frost free or just generally warm. Do you have any tips on heat tolerant varieties or just tips for them?

00:42:14

BH: Yeah, you want to be planting out in probably early January, whatever your coolest part of the year is. Wait until you're in your coolest part of your season and days are short. You know maybe around the uh, yeah, late December, early January, and I know some folks in New Orleans that plant usually early January because days are short. They're not getting the light intensity to trigger flowering yet. Temperatures tend to be cooler. Yeah, just look for those shortest coolest days of the year and that's when you're going to want to plant if you're in a really warm spot.

00:42:54

AS: OK, next one we've had a lot on is pinching so are there varieties that are better to be pinched? Should you pinch? All those good things.

00:43:03

BH: Great. Yeah, as I mentioned before, if you pinch, you're going to get more stems, but they're going to be smaller. If you don't pinch, you get one stem at a time, but much larger. I don't know that any studies have been done in terms of which varieties respond better. I think they will all respond to it. My

only tip would be if you're going to pinch, you can plant them a little further apart, because when that plant branches out from the base, you're going to get four or five stems coming up rather than the one, so you want to give it a little more room so they don't become too congested. There's a Cornell study out there that I'd have to... I think you can Google it. They evaluated, like, total profits based on pinching or not pinching, and I think per square foot they saw you could make more money with pinched plants than without. But if you're selling into a premium florist market, I recommend not pinching because you're just going to get bigger stems.

00:44:05

AS: OK, I think we're sort of winding down on the overall gist of the questions, but the next one is one of the hardest, and it kind of comes into how you grow, weeding. So weeding, and if you're going to use fabric or plastic, do you have a favorite?

00:44:26

BH: Well, fabric is plastic. Let me just say that. There's a lot of people who think that they're saving the planet by using fabric, but it's woven plastic. It's just thicker plastic that is still going to be with us for a very long time. Yes, you can reuse it, and that's great. I always had trouble planting in the plastic with burnt holes. It just like shredded my fingers. It was hard to get, especially when you're planting you know eight per square foot, those holes have to be so you have so many holes per square foot. Then you're just leaving a lot of room for weed seeds to germinate. I found better control planting into plastic. And, I never really did try the biodegradable plastics or the biodegradable mulches because our season is so cool and short. I think they need a warmer or more humid season like you would have in Kentucky to really breakdown. So, I know, just to bring up, Lisa Mason Ziegler, again, I know she loves that kind of corn starch based stuff. I've never actually used it. So, at the end of the day, I decided to just use plastic mulch. I would use the silver mulch to keep the soil cool to make sure I wasn't getting rosetting and I never had a problem with it. So, the plastic mulch kind of closes around the plant after you plant. It kind of shrinks back around it and I really maybe only had to weed once per season, and that was only every five feet would I find a single weed. So, whatever you need to do to keep your weeds under control. It's different for every situation. There's no magic solution other than just get rid of your weeds.

00:46:07

AS: OK, I've got two more and then I'm gonna pass it off to see if anybody else saw some that I missed. One was, I've lost my train of thought, oh, the best growing medium, especially if you're going to be bumping up anything that comes into you.

00:46:25

BH: I would say they're pretty flexible. Use something sterile. I mean a compost-based medium is great, just make sure it doesn't have, you know, fresh garden soil mixed in because you might be infecting them with Fusarium. It seems that the brands kind of vary region to region. I would often use just the Pro-Mix BX that we can we can get locally. As long as it's a sterile media. Most of the peat-based medias are sterile and we're still using peat in the US. The rest of the world has switched away from peat because peat is a very limited supply, so I think soon we have to have the conversation about not using peat and switching to more compost-based media, but just make sure it's been sterilized. You don't

want to put them into something with Fusarium in it. And, use a clean tray. Wash your trays. Especially for this crop. Zinnias maybe not, but Lisianthus, use a clean tray.

00:47:25

AS: Do you recommend growing in a tunnel versus field grown versus low tunnel? Do you see benefits of one over the other?

00:47:36

BH: Yes. I mean, if you've got a high tunnel, that's where I'd put them. They're a high value crop. They get taller or the flowers get bigger. You have fewer blemishes and spots on them when grown in a high tunnel. You can go grow them in the field, but if you get a lot of rain, you're going to see spotting in the flowers. Blues and lavenders for some reason show more spotting than the other colors. I don't know if they have a thinner petal, but for some reason they just get a little more spotty, so you know if you're making a choice, put those – put your blues and lavenders in a tunnel. Grow the others outside, but ideally you can put them all in a high tunnel. I haven't done much with low tunnels, I mean my lisianthus get 36 to 40 inches tall. So low tunnel is going to be too short in most cases, you need a tall low tunnel. If you, I mean, I know I know high tunnels are expensive, not everyone has them, but usually that's the first crop that people put in their high tunnel once they have it. Try 'em outside. You might be great with them. I don't know. It all just kind of depends on your own conditions.

00:48:45

AS: Alright, one last one, then I'm going to pass it to Felicia, see if she caught anything that I missed. But what is your favorite variety? That was a popular question. Asking about a favorite child, right?

00:49:00

BH: I think that might be an easier question. I definitely have a favorite dog, but they're in the room. I won't tell - I won't say it out loud. They're all I mean, all of the varieties we sell, I stand behind. We trial everything before we put it on our website. This Celeb series from Japan. I went there in 2019 specifically to track these down and not to pat myself on the back, but the only reason we have them in the US is because I went over there and begged and pleaded that they share seeds with us. The huge range of colors, these misty pink and green are just a barely pink. The Breeders in Japan didn't understand what we wanted in the US. They thought we wanted hot pinks and bright purple and just really wild colors because America is big and colorful and I had to explain to them that we use these mostly for weddings and we want the softest pastels we can find. And I've seen the supply change since then, so I'm glad they heard the message. Yeah, the Celeb is probably my favorite series. Voyage. You know the Association of Specialty Cut Flower Growers, voted Voyage light apricot, cut flower of the year and I can't argue that. It's another one that I helped introduce to everybody.

Let me just go on a tangent here. The Association of Specialty Cut Flower Growers, ASCFG. I'm currently on the board of that organization. Most of what I know about growing cut flowers has been learned through this organization that charges you \$200.00 a year to be a member. Now there's a lot of workshops out there. A lot of people selling information that they have learned from the ASCFG, but it's available to you for the low price of \$200.00 per year. So, I think it's really a great professional organization. Go to a conference when you can, it's a really great place to network. So, I can't sing their



praises enough. So, I have my degree in horticulture from the University of Kentucky and then I've worked as a floral designer for a long time, so I know how to grow things and I know what to do with the things afterwards, but I was missing this critical little bit of information in between, like how you support it, how you space it, how you fertilize it, and I got all of that from the ASCFG.

So yeah, Voyage is also excellent. It's actually our top our top selling variety for a series. Can't go wrong with it. I like them all though.

00:51:36

AS: Felicia, is there anything that I missed?

Felicia D'Ambrosio: So we had one question about deer. Do deer like to eat lisianthus?

00:51:47

BH: I will defer to someone else. Well, I don't think they do. Yeah, our neighbors shoot all of our deer so we don't seem to have any around and never had a problem with it.

00:52:01

FD: Alrighty and then one of our guests noticed that she's hearing that Lisianthus grow longer stems in a tunnel. Why would that be? And is that true?

00:52:14

BH: Very true, absolutely, that'll that goes for almost all cut flowers. So, you have slightly lower light levels in a high tunnel. The poly on your tunnel blocks some of the light and so things have to stretch a little taller. Now you might even go so far as to put some shade cloth on there to reduce your light levels more to stretch things even taller. You also get lower wind movement in your tunnel. And, you know if you have a plant that's jostling around all the time, it's going to be stockier and shorter. So just that you know a little bit of protection from the wind does make any plant grow taller, so it's not just lisianthus. Really any cut flower in a tunnel is going to be a bit taller than its field grown counterpart.

00:53:02

FD: Bailey, do you have an opinion about holding temperatures for post-harvest?

00:53:07

BH: We always kept our cooler at 38 and that seems perfect. You can go, I'm sure you can go, a little cooler, but then you risk maybe if it's verging on freezing, sometimes you might lose some. So, 38 seemed always kind of safe temperature for us. Also, the ASCFG has a whole book on post-harvest handling. John Dole at North Carolina State University has done a lot of research. I don't offhand recall his particular findings on cold storage of lisianthus, but 38. I'll say, this spring, I forgot I had some. I'd put them in there three weeks prior. I forgot they were even in the cooler and just in a pinch and I needed something. So, I looked at the cooler and remembered I had cut this stuff a full three weeks, maybe longer, earlier and they were absolutely suitable for the event still, so very long lasting.

00:54:07

FD: So, we have a couple more questions. Do you want to answer a few more, Bailey, or do you have a cut off time?

00:54:14

BH: I'm good.

00:54:15

FD: OK. Cool, do you use manure on your lisianthus?

00:54:20

BH: Yeah, I have used compost, cow manure, there's a commercially available compost. I think Vermont compost has some donkey manure and chicken manure in it as well as, you know, municipal compost. More importantly, just keep putting organic matter in your soil. Keep testing your soil and follow those recommendations. That's something you should be doing every year, even if you think you know what's going on with your soil, things can change really quickly, but you're not going to go wrong with organic matter. You know, just be careful not to over fertilize them, but you know, fresh cow manure can. But almost anything that's fully composted is great for almost all soil.

00:55:04

FD: When you're doing crop rotation, how long do you wait to plant in that space again with the same crop?

00:55:12

BH: Honestly, probably only every other year, because I don't in my tunnels. I would grow sweet peas and I grow lisianthus because the lisianthus are just better in the tunnel. So are the sweet peas. So, I kind of rotate one year on, one year off. I think unless you're seeing just a really bad Fusarium problem, you should be OK with that. You know, as we saw crops of lisianthus a year in the same soil, but they're steaming in between each one, so always good to take a break whenever possible.

00:55:51

FD: OK, here's a good one. How do you install your support netting?

00:55:55

BH: I don't think I have photos of it. I got the Johnny's Hoop Bender, which makes these kind of horseshoe shaped hoops. Now, it uses half inch electrical EMT conduit. The thing is, that stuff has gone up in price 300- 400%, you know. I think I paid \$2.00 a stick, a 10-foot piece, when I bought it and now it's going for \$8.00 or \$9.00, so that becomes less economical at that price. You know, I haven't priced out T-posts in a while. I'm guessing they're also pricey. Maybe just, you know, 5 foot tomato stakes, 4 foot tomato stakes, pounded into the ground would work. As long as it's nice and tight, get it a little tighter than you think you want it because it stretches a little bit in the heat of the sun and then my other tip with supporting is raise it up just before the plant wants to grow through it, because I always made the mistake of leaving it too low until the plant is, you know a foot above, and then you've got so much foliage it's really hard to get it up. So just raise, you know, put, like I said, use two layers, start them at the ground level. When the plants are, I don't know, 6 inches, pull both layers up just above the

top leaves and then when they grow another 6 inches to a foot, pull that top layer up. It's real art learning how to how to stake things, but you're always better to do it a little sooner than a little bit later.

00:57:24

FD: Bailey, if you think you can get a second flush, how would you achieve that?

00:57:30

BH: So, in that case you want to, you know, if you want it to be a uniform flush, you want to harvest most of your plants at the same time. Now, if you're just kind of picking and choosing who's open this week, you know what flowers you cut this week or next week, then your second flush, won't happen until you cut off the first flower, so I would leave probably 6 or 8 leaves at the bottom of the plant, so maybe, you know, leave two to three inches, but, you know, cut them pretty far down. You're going to really kind of shock them into growing again. They're going to think something bad has happened to them, which it has, but that's when they will be like, hey, we need to try again and flower. You know, any plant's purpose is to make a flower and make seeds and reproduce. So, if you're cutting its flower off, it's going to try again. So cut them, cut them hard. Cut them uniformly across the bed. Give them a good drink and a good feeding at that time. That will really trigger them into throwing out that second flush. Kentucky should be a great place to get a second or maybe even third flush. Vermont, not a great place for it.

00:58:32

FD: Let's see, how many stems per plant could you expect if you're not pinching out that first flower?

00:58:39

BH: One, unless you get a second flush. The second flush will branch, so you probably get maybe three or four on your second flush. But with us, we went for one great stem per season per plant.

00:58:52

FD: Let's see, what's the most important thing we can do to make sure you get strong stems?

00:59:03

Never had much problem with it. So, calcium is related to strong stems in almost all cut flowers and definitely lisianthus. Now, it's not just the presence of calcium, you need the water to move calcium around. So, if you read up on blossom end rot in tomatoes, that's kind of the most classic example of calcium deficiency. It's not related to the amount of calcium in the soil, it's just a matter of keeping uniform moisture in the soil so the plant can always be moving those nutrients around. You will see some, if you ever have a flower, that pops its head off, that's because it probably didn't have uniform watering in its life. You know, particularly, Kentucky growers shouldn't have much trouble with calcium. You know, if you're growing on limestone soil, you don't really need to be adding any lime or any calcium to the soil, but you might just need to make sure your watering is consistent and that plant always has access to water.

01:00:01

FD: Bailey, can you talk about watering seedlings a little bit? I know you mentioned it earlier that you can't use the drip tape, but what is the best way to water your plugs at transplant?

01:00:09

BH: Yeah, that can be with a hose. It can be with a lawn sprinkler. You know any time you transplant anything it's got to be watered in very well immediately. You know if it's a hot day and you're planting out in full sun I would, you know, plant 20 feet and then water it before you keep planting. And also never, never plant into dry soil. Make sure your soil is well irrigated before you plant. You're just asking for it, you're stressing the plants, so plant into moist soil. Water, even if it is moist soil, water again. Even if you think you've got enough rain, water again. They don't really care where it's coming from, but often drip irrigation is not enough when that plant is little. And then you can also, you know, if you put some kind of frost cloth or Remay over, even if it's a warmer part of the year, you're really keeping a little microclimate. Bringing your humidity up, reducing transpiration. You have actually a nice little greenhouse environment over your plants. Once you see they're growing on their own, that means they put out roots. They found soil, they found water in the soil. So that's a good time to take that cloth off, but yeah, just make sure make sure they got water, however you can give it to them.

01:01:25

CF: Alright, well thank you so much, Bailey! I wish that we could do a huge round of applause. This was such an informative webinar. I do want to make two – OK – I'm going to make a really bad joke here: I want to make two plugs here at the end. Right, I'm going to drop in your website into the chat so people can go there and if you want to just real quickly mention how people could order from you. If everyone is so enthusiastic and they want to order a pallet of 30 flats for next season. You want to just kind of step them through the process a little bit?

01:02:02

BH: I'm sure, yeah, I'm a bad salesman, I should have tried to promote myself more. So, our minimum order is 3 trays. That can be any three things we sell. You know, there are some things grown in half trays. But, if you just spend a little time there's a part of the website - the first thing you see would be like hey, are you new? Read this first. And that'll talk about all of our different tray sizes. It doesn't have to be just lisianthus, it could be stock and snapdragons and poppies and whatever you want. We have about 800 different products, so we've got a lot of cut flower items. The thing with lisianthus is, it takes us 12 weeks to grow them, so we need your order 13 or more weeks before you want them. So, rule of thumb is to order before Thanksgiving, which I believe is this week. So, this is a really great time to remember to order your plugs. The other thing that will happen sometimes is the facility at Gro 'N Sell just gets full and we can't produce it for the date you want it because other people have placed their orders first. So, you don't need to panic, but if you're thinking about plugs this year, this is a really great week to get your order in because you know, come Christmas time things start getting tight, the space is just fully booked.

01:03:19

CF: I'm also going to drop in your Instagram for folks to follow along if they need a little eye candy, flower eye candy, flower candy, whatever that is, because you do have some gorgeous photos and that's a great way for folks to engage with your business. So again, really want to thank you for being on. The

webinar is being recorded so we will make it available. Everyone who registered will get a follow up e-mail from Kristin with the link and also you know some of the questions that we didn't have time to get to tonight, or that were super-specific. We will get that out and, also, we have just a quick little survey for folks to fill out and that'll help us with future programming, so we'd really appreciate - not just us, Kentucky Horticulture Council, but also Farmer Bailey and his team - some things that maybe people struggle with, some barriers, and we'll collect all that information in a post event survey and then my last bad joke plug, well two, we in Kentucky have a curated page of cut flower resources and Josh dropped that in the chat so folks can go and look there.

01:04:36

CF: The link to this recording will be on that website after we have a chance to kind of clean it up a little bit and get it out there. There will also be a transcript that you can go back and look at as well, and then finally I'm just going to put a quick plug or a little image up here. We in Kentucky are going to have a cut flower short course in January, so for those – and, Bailey we'd love to have you here, but you'll be gone and you won't be available, but if you wanted to come we would love to have you back in Kentucky. So that's in January. We've got a great lineup scheduled. It's part of the Kentucky Fruit and Vegetable Conference, so we encourage anybody who's here in the area that wants to participate in the short course, and we'll have some great topics covered there. So, I'll leave that up for a little bit, but again, Bailey is so great to see you. It's been, a year or two since we've seen each other, so it was great to have you here. And I was glad to see you wearing the blue. Me too.

01:05:39

BH: Yep! Put it on on purpose. Go Cats!

01:05:42

CF: Yep, for sure, for sure, but we really appreciate you being here with us tonight answering the questions. I've learned so much about lisianthus, I don't know that I'm ready to try it myself. I'm still a little scared based on a lot of the questions, but the fact...

01:05:56

BH: It's easy!

01:05:57

CF: The fact that it's deer resistant, at least, or deer proof, that makes it very appealing for here in Kentucky for sure. But again, just wanted to say thank you so much for being with us tonight. Always great to see you and have a great sales season. Hopefully lots of folks from the webinar tonight will go and check out your inventory and place some orders and we always love to see new operations come into the cut flower industry. And, you know, hope folks reach out for good information. And like you said, not just looking at random information, but being sure to look at expert information that's out there from the universities and experienced growers and the Cut Flower Association. I dropped in the chat there for our Kentucky growers, we are lucky here that we have the President of the Specialty Cut Flower Growers Association in Kentucky. She's a cut flower grower with Three Toads Farm, Val Schirmer, and we can get a discount code for folks who are interested in joining the association for the first time.

01:06:56

BH: Yeah, we love, we love Val. Val is one of my great friends, so I'm going to see her next Sunday, I think.

01:07:02

CF: Oh yay, great.

01:07:04

BH: Yeah, I'll be in Kentucky for just three days, but I'm having brunch with Val, so yeah.

01:07:07

CF: Oh good. Good. Well, maybe I'll see you on the road somewhere way back here. Yeah, alright, well thank you so much. We really appreciate it and we'll follow up with all the folks in the webinar and we'll go ahead and closeout. Thank you.

01:07:22

BH: Great thanks Cindy.

01:07:23

CF: Thanks, everybody.