ONTARIO LAVENDER ASSOCIATION

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Q&A WITH DR. SEAN WESTERVELD – April 24th, 2021

Required viewing:

1. *Spring Tips for Growing and Pruning Lavender*
2. *Cultivar Verification Trial*

FREQUENTLY ASKED QUESTIONS (FAQ)

1. **Once we start to see a little bit of new growth, once it gets hot and humid how do you fight mold?**
SEAN: Generally, we do not have a lot of mold/fungus issues in lavender, except for Phytophthora which is something that is often brought in on propagation materials. We recommend when you buy your plants, quarantine them for a few weeks and watch them. If any of them start to collapse then you should probably get them tested at that point and if there is Phytophthora then you would have to destroy the whole batch and get back to your propagator. Generally, if you have well-drained soil, Phytophthora is not an issue. The other disease lavender can have is Septoria leaf spot. It comes in late in the season, usually when there are heavy dew periods. We don't know how much impact it has. Generally, having it in full sun and open to the wind is enough to control that sufficiently. Insect pests are more of an issue. Generally, you don't want to open up the canopy too much, you want it to be a dense mound. You want to prune it after bloom in the summer to form a dense mound. The plant will self-protect itself over the winter because it is dense, the air can't get in. Row covers help to keep winter from causing further damage. There is not typically a lot of diseases that are an issue when the plants are dense.

Right about now, we are seeing some of the green growth start. Some may have last year's leaves that have turned brown or died over the winter, especially those that bloomed late in the season. For example, Super Blue looks horrible right now. In the Super Blue, if you look close to the stem all the little green growth is coming. Generally, it was a pretty good winter for survival.

2. **What tool do you recommend for trimming in the spring?**
SEAN: Generally, we don't do much pruning in the spring. A lot of times, if you pruned it well the year before and there isn't a lot of winter kill then you just want your plants to grow. Depending on how many plants you have, if there is winter kill and you have a few plants, just get pruners and cut

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the dead branches out to get more light down to the new growth which will fill in the size and shape. Some growers use a lightweight automatic cordless hedge pruner.

HAROLD: We use pruners with cords on. We have a small generator that we pull using an ATV and we use electric hedge clippers with cords, but you can buy them with batteries on them. We like hedge clippers because they are fairly long and fairly quick. It goes a lot quicker than hand clippers.

3. **What are the water requirements for new lavender plants?**
SEAN: When you first plant the plant, you need a little bit of water to wet the soil where the plug is or where the pot was. If plants are hardened off, you can start planting them anytime now. If they are not, you do not want to take them straight from a greenhouse and plant them. You want to harden them off and not expose them to any freezing or frost if they came straight out of the greenhouse. If they were over-wintered outside, or somewhat sheltered, then they could probably be planted. This time of the year the soil is already moist, you don't need a whole lot of water. The water requirements increase as the plant grows. Most growers are planting on plastic mulch, the plastic is keeping the soil from drying out. It would mainly be during a heat wave, where it hasn't rained for a few days and then just getting a litre of water to the plant. Half a litre might be fine when the plant is small and increase as it grows. The water requirements are similar to any other plant in the garden.

4. **Should we start pruning off winter kill now? Or should we wait for a specific temperature?**
SEAN: You don't have to wait for a specific temperature, you can prune anytime. It might be a little early to see where that new growth is. If a branch looks dead now, it still might produce secondary buds over the next couple of weeks. You may wish to wait for another week or two for another warm spell to let it start growing, then you will have a better idea of what you need to prune off. Some years you might not have to prune anything at this time of the year. If they are nice compact plants from last year and you didn't have a lot of winter kill (especially if you covered them), then there is not much you need to do.

5. **Would pruning now affect the timing for the flower blooming?**
SEAN: Below is the bloom timing for the different cultivars in my trial in 2020. Last year, the cultivars began blooming around June 18th. The peak bloom was somewhere around July 5th for all the Angustifolia and then the Lavandins were around July 18th. A heat wave in late June and early July last year caused everything to bloom much faster than normal with less spread among cultivars. This year is probably going to be ahead of last year unless we get a week of snow in May like we did last year. It does depend on where you are, the further south you are the earlier it is, but it might be around the 10th of June or so that the very first blooms will start to open. Pruning now will probably not affect the timing of the blooming later. If you had to do a hard pruning now it would probably delay the flowering a little bit. The buds are just starting to brighten now so if you cut them off and then new buds have to break, it will probably only delay the bloom by a few days later.

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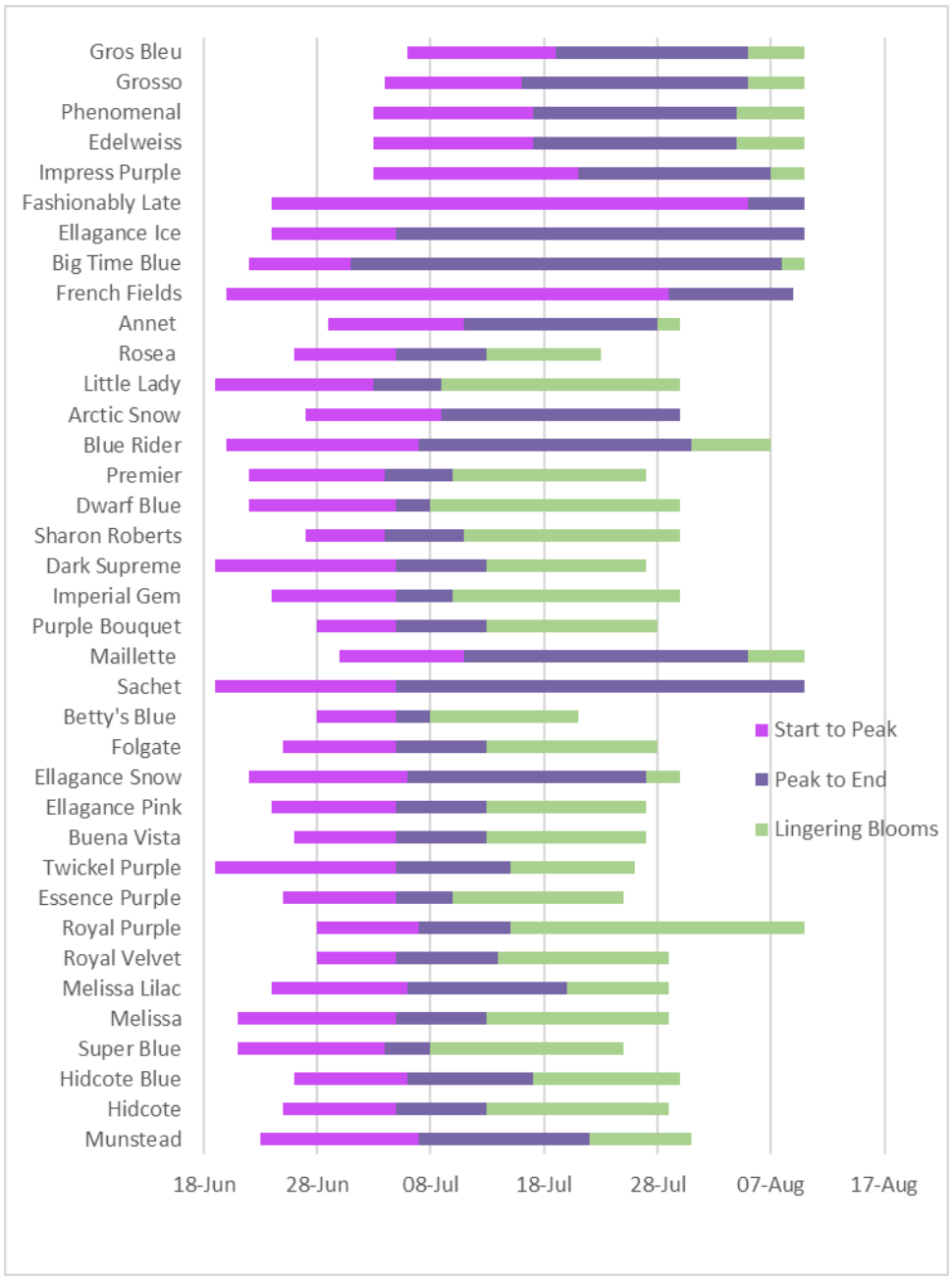

6. **Why are we seeing winter damage on some plants but not others? Does wind have any impact?**
SEAN: Some of the winter damage is based on what the plant looked like going into the winter. If it was really vigorous and fast growing, as soon as freeze hits it looks awful. However, sometimes the next year, you can see the green coming from the stem and see them starting to come back. Sometimes plants may not come back if it is too wet. Although we did not have a harsh winter last year and it was very dry, but if you had your plants sitting in water or in heavy soil, some of the roots may have died and that would have affected the survival.

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7. **Is it possible to clone a lavender plant? Do they re-root once you put growth hormone in them?**
   SEAN: We recommend that all plants be sourced by cuttings and not from seeds. Cuttings are genetically identical to the mother plant. We take vegetative cuttings, it takes a long time for lavender to root (between 3-6 weeks), the challenge is keeping the tops from drying out or rotting while the bottoms you are trying to get some root growth. Some varieties are easier to do than others. The Angustifolia varieties are easier than the Lavandin varieties.

8. **Survival of some cultivars in raised beds depending on their height because of freezing?**
   SEAN: It depends on how big the raised bed is. If it is a steep raised mound sticking up out of the ground, then the top would freeze and be more exposed than if it was flat. If the bed was flat, it would be less likely to freeze. It is a concern that the snow would blow off of that mound and then into the valley in between. That's where row covers would help. If you had plants in pots, you would lose more than if you had them in a raised bed.

   YVES: Raised beds are about 6" high by 22" wide, we haven't had any issues with freezing, but we didn't have that much snow. We also put-up snow fencing as well. The raised beds about 6" high did not have too much impact on the plants.

9. **What are your suggestions for row cover material for Zone 4-5?**
   SEAN: We have done experiments with the two main types that most growers have. You either go with the thin, floating row covers that they use for season extension for vegetables or anything like that. Most growers are getting those from Dubois, Agryl P40. The very thinnest covers are not durable enough to survive the winter. In most winters, the Agryl P40 is enough to protect the plants, but in the very cold winters that wind is going right through the thin cover and can cause damage. The other option with the thin cover is to double it up which can provide extra protection which would be enough to minimize damage in any winter. The other main type is Hibertex Pro, it is more like felt. It is a blanket basically. A lot less light gets through. It is really good protection for those cold winters. It is a lot more expensive and bulkier to store and haul around. Mice love to build nests in it, so where you store it, you would have to have mice control. It gets weighted down with moisture and that's the issue with it. The only concern I have is if you have a milder winter that is very wet, the row cover stays wet the whole time, then you may have some mold damage to the plant. The thick cover gives you a bit more flexibility in the spring because it doesn't act as a greenhouse as the light doesn't get through it. Thinner covers act as a greenhouse and it gets a lot warmer. On a sunny day, it might be 15 degrees warmer during the day then at night. The plants are advancing way to fast. If you get a cold snap it could cause damage through the cover.

10. **Do Munstead and Hidcote need covers at all or is it hardy enough?**
    SEAN: Generally, most augustifolia's can survive the winter. I have several in my garden that I never cover and they are fine. A lot of grower's never cover their Angustifolia. The one thing with the Angustifolia is that they have drainage.

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11. **I am considering putting down pea stone or drainage stone between our rows – is there any concern with this?**
    SEAN: I'm not a big fan of putting stone out on a field. If it is a small area, there is not a big issue. If you are putting stone into an agricultural field, you have to consider what you are doing to that field. If you want to grow something else after, you have added stone to the field which interferes with other planting material and machines, etc. If you wanted to use any mulch, the chunky thick mulch is the way to go. It does allow enough air flow and moisture flow that it is not going to smother the plant and keep a lot of moisture around the crown. If you put a thick layer of the standard cedar mulch, that people put in their garden, around the lavender plant it would probably keep it too moist and cause some damage. Most growers use the plastic mulch which seems to be the best for weed control. Grass is what most growers have between their rows. Grass does have a disadvantage in that it does steal a lot of moisture from the plant. Some growers are doing the solid panels of the woven mulch, the "ground cloth," and in the row, between the row just put out a 15-foot-wide panel of that and then put the lavender in there and then put grass around that. The only issue is getting moisture and nutrients between plants so you would be relying irrigation for that.

    From a drainage perspective there is no concerns, gravel would be a very good cover. It allows drainage, airflow and it could potentially provide weed control. Do not mix it in with your soil. The heavy soil particles will fill all the air spaces between the gravel and the soil and you will have the same problem. It would not help with the drainage of the soil that is below there but it does not block any.

12. **Do you have any recommendations for perennial cover crops between rows that would benefit the lavender?**
    SEAN: A lot of times grass has a way of making its way in there no matter what you plant. There are other options, but not all of them are as walkable like grass is in terms of you might not be able to mow it quite the same or it might not tolerate the foot traffic. Clover is a good example. You can't mow it close; you have to keep it a certain height. A lot of times you end up managing a lot of weeds in the cover that you put in there. If you went in there and started mowing constantly, you would just end up with grass. You could look at the mid-west cover crop council which has an online tool that you can use for different circumstances.

13. **What can you do to protect the plants like in a 2014-2015 situation of late spring frost? Check the weather and put the winter covering back on beforehand?**
    SEAN: The only thing you can really do is to go back out and put the covers back on again. Cover what you can't afford to lose. Enough that you can have customers on the farm so that you can still have lavender. It is usually one night that you probably know about a day or so ahead of time. If it is anything below -1 air temperature you have potential for damage. You don't have to secure it quite as much as you did for keeping it there all winter. It does depend on how windy it is the day before. You can pull it over and put sandbags on the corners and that should secure it. The only other option you have is overhead irrigate over the crop. You start the irrigation before it freezes and then it has to continually keep applying water to the plants until the frost is over. You might have an inch of ice on the plants, but the plant doesn't freeze. There is heat release as water freezes which keeps the ice at 0 degrees Celsius and your plant will not freeze at 0 degrees because it has solutes in there

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which keeps it from freezing to about -2C. It would work for lavender but most growers don't have the capacity.

14. **Would you only put the cover back on because the plants are out of their dormant stage, correct?**
SEAN: Yes. In 2015, the damage happened when the flower buds were visible. At this stage now, the plants are fine. They gradually get out of dormancy. Always bear in mind that the overnight temperature forecast is for eye level. It can be several degrees colder at the ground. The best thing to look at when it is going to be cold is to look at the dew point. The dew point tells you how dry the air is and how much colder it could be at the ground.

15. **It's recommended not to cut to wood of the plant – what happens to the plant if you do?**
SEAN: If you were to cut a pine tree down to the wood, it would not produce new buds from the wood. Once you cut the green off, that branch dies. The same thing happens in lavender, but mainly to the lavandins. The lavandins do not have the ability to re-grow from the stem very much. Especially if you cut all the green off all at once. The angustifolia you can cut down to the wood and it will send up new shoots, but it does depend on the time of year you do it. If done in the spring, which is what we talked about with a lot of winter kill, the plants are ready to sprout at that point so they will grow back from the stem. The lavandins they will die. Generally, you prune after the bloom. When you are pruning flowers for an oil harvest, you are cutting all the flowers off with a little bit of stem, but you are leaving the lower stem and the greenery. At that point we recommend cutting about half of the new growth off (the dash line in between). If you were to cut all of the green off, especially if it is at the blooming stage, then that plant would most-likely die. Ideally, you are starting this process every year and keeping the plant compact so you do not need to cut into the wood. If your plants do become very loose and woody, where the flowers are in patches and there are open spaces in between, you can prune a few branches a year off until it is back into a rounded shape. You do not want to do it all at once. For example, you can cut 2 of the branches off, but because there is greenery still on the plant it would still have enough energy to send new shoots up. We are talking mostly about augustifolia here, the lavandins is a little bit different, it is harder to do that. Eventually as you cut the other branches off it will go back to its rounded shape. Ideally, we can avoid that from the beginning by keeping it pruned every year with cutting about 50% of the green off. Unless it is the spring and all of the greenery is dead because of the frost, then you can cut augustifolia down to the start of the new growth because it can sprout growth from it's base.

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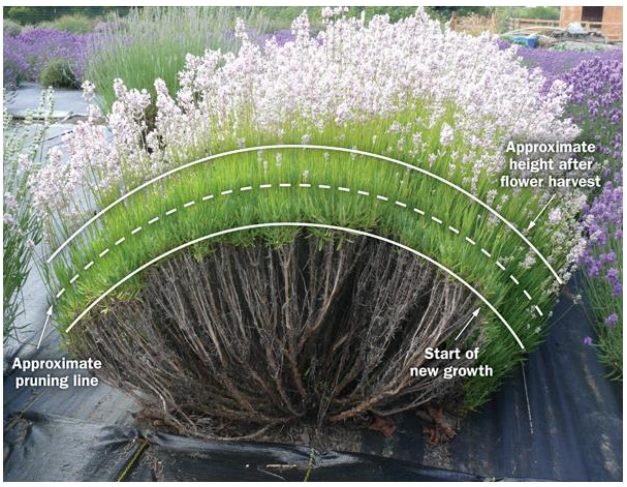

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16. **What is the best practice for growing potted lavender? We have 315 plants arriving in may and want to use a flood bed, is that a good idea?**
SEAN: Some greenhouses do ebb and flow benching. Basically, the pots are all in trays and at certain times irrigation water is pumped in for 15-20 minutes to wick into the plants and then it goes back out again. You cannot have it sit in the water because even what is absorbed is too much for the plant. There is one big red flag when it comes to that kind of watering. A disease in one pot becomes a disease in all the pots because you are sharing the same water. In theory, it's an efficient way to water as everything gets watered evenly, but especially phytophthora has swimming spores which can just move from pot to pot. The better option is to do the overhead watering which is a little more labour-intensive. The water is going down and draining out it's not sharing the water. You could use a sprayer of any kind as long as you get the volume required to fully water them. The biggest mistake a lot of growers with pots have is that they don't water enough each time. Ideally, you soak them when you water them and then you leave them until they start drying out again. You don't want them to wilt, lavender in a pot can wilt and then it doesn't come back. It is really important to make sure that when you water you water right through because what can happen is you have the pot and the top half is watered but the bottom half is bone dry. Because it looks wet, it is assumed the plant is watered enough. Some growers mist every 20 minutes, which is not a good idea because you can get moss and mold growing on top and then the bottom is sitting bone dry and you are not getting the root ball you need. For most growers you can set up a sprinkler and have it run on a timer, but do not rely on a timer if it is going to rain because you can overwater.

If the soil is moist but the lavender plant is wilting, it is likely you have a disease. It is not just phytophthora, there is also pythium and fusarium which are fairly common. Most of these come from having the root ball too wet most of the time. If you see the plant wilting but they are not dry, then the University of Guelph has a diagnostic clinic and they can do a DNA multi-scan. It is a little pricey, it is about $200 for one test, but it can tell you what fungus is in the pot. If it is fusarium, then it's probably that pot just got wet too long. Then I wouldn't be as concerned about destroying the rest of the plants, but if it is phytophthora then you have to be a lot more careful.

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HAROLD: There is a good point to be made here about trying to hold plants over. If you are trying to hold plants until your field is ready to plant, I have had bad experiences with that. Have your field ready to plant for when your plants arrive, holding plants is tricky business. You can lose them. Have your field ready to go and get your plants in the ground as soon as possible as holding them over for a week or two you will lose them.

SEAN: The issue there is phytophthora protocol, if your plants have phytophthora then you just planted it in your field. It may be a requirement that you go to the propagator and if they are a reputable propagator and they monitor for phytophthora, then they are doing the work for you. You also may have to hold over plants because you cannot have a plant go straight from a 25-degree greenhouse then go into a 5-degree field. You may have to wait to plant until early May or into June, so it is comfortable for those plants. That is if the propagator is not hardening them off. Ideally, the propagator is hardening them off for you.

HAROLD: Let the professional look after it until you are ready to plant them in the field is what I would say.

SEAN: The smaller the plant, the less flexibility you have. The smaller plants can dry out in an hour. The bigger the plant the more flexibility you have.

17. **Do you have specs/recommendations for a drying shed?**
SEAN: This is not my expertise, but most of the time the biggest issue is that remember lavender is a culinary herb that is used for cooking and sometimes it is used directly after cooking. The customer may be putting the raw lavender on their product and eating it. You have to make sure that wherever they are handled they are not being run over by mice and that there are definitely no birds in that area. Definitely an open barn is not ideal. If you have a large barn and recognizing that it is July, most of the time (assuming they are sealed off from birds and things like that), as long as there is enough space in there and there is some air flow, most of the time that is fine. If you don't have that option, something like a tobacco kiln might be an option on a larger scale. Most of us have sheds or barns or something with enough space. Mice are not so much of an issue if they are hanging, but making sure birds are not there is important. Make sure the bundles are not too thick when you are hanging them to dry. This increases the airflow and you don't have things crushed in the middle of your bundle that are not drying. Because it is July most of time, there is enough warmth and it is usually fairly dry in a building in that time of year. You might need a fan if the area is small and there is too much plant material in there.

HAROLD: Make sure the bundles are small.

EMILY: Keep humidity in mind too. Air flow and dry. I had mold issues with higher humidity. I'm not sure if other growers have experienced that.

18. **Is the recommendation laying flat to dry versus hanging?**
SEAN: Hanging is the best way to go. You can do it flat on racks. The question is what you are using it for. If it is for bundles, depending on how they are laid out some of the stems might wilt as they dry

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and then they dry in that bent form. If it is for bundles you are probably better off to hang them to dry. If it is for buds, it could be done in racks.

HAROLD: On a rack, it will be flat on one side.

SEAN: As long as the shape doesn't matter to you, then you can use racks for buds.

19. **Does your area need to be darker or is full natural light okay? How long do they need to dry for?**
SEAN: Natural light is fine. Sunlight will gradually decay your plant material, but not enough in the week or two that you are drying it to cause any issues. The light level I don't think is a big issue. You can determine they are dry enough because the stems should just snap and they should not be flexible.

HAROLD: We take them down when we have time. They could be hanging for weeks. We try to keep them in the dark because they will fade over time. We have them hanging in the ceiling of our lavender boutique and they will fade versus in the ceiling of our lavender barn.

20. **How do you store the dried lavender if you do not have the room to keep them hanging?**
HAROLD: If we are selling bundles, we take them down and put them in bushel baskets. The elastics that you tie them up with soak up oil and deteriorate and you will have bundles falling off your hanging wires and onto the floor. You can't keep them too long. We take them down and put them in bushel baskets until we are ready to strip the buds, but you have to be careful with the ones you are keeping for bundles because we don't want to knock a bunch of buds off. We do not stuff them into anything, but we try to keep them straight. After we take the buds off, we put them in food grade 5 gallon pails from U-Line and we buy desiccant packs and we bang the lids on tight and that's how we keep them.

SEAN: Jim Todd, my colleague has shown that you can bake Epsom salts in a 200-degree oven with for about 45 minutes. It will dry off the water that is attached to it and it works quite well too if put it in a pouch. Espom salts are magnesium sulfate heptahydrate, with the heptahydrate part meaning every molecule holds about 8 water molecules, it pulls that out of the air. In the oven the water molecules dry off. So that is one way to do it. Plus, you can reuse it, so once it takes the moisture out of the air againr, you can just bake it again to dry it out.

21. **What is the ideal humidity level?**
SEAN: I'm not sure as I don't believe anyone has ever measured that. I believe you would need to be below 50%. I think you would fine because it is so much warmer in a sealed barn then the air temperature it means it is quite a bit dryer as well. Generally, you are looking at 30-35% humidity and lower. If you are in a too tight space with too much plant material, keep it at 50% and lower for sure.

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22. **I'm a virgin grower – and I've not yet begun planting my test plants into the ground. Planting in a field of grass zone 4b in sandy clay soil with a very slight slope to move water way from plants and there is full sun all day. Any tips or suggestions to a new grower to avoid mistakes my first year? (Note: I plan to make mounds of raised soil)**
SEAN: Sandy clay is a unique soil, but remember that sandy is the descriptive part, the clay is the actual soil. You have heavier soil. The slope is going to help. Sometimes there is the advantage if you have tile drainage as well. The advantage is that soil doesn't stay moist for too long. Zone 4b is going to be an issue if you don't have row covers or a consistent snow cover. Row covers are probably going to be really important in that zone. Lavandins are going to be a bit more of a challenge in that 4b zone. I would focus mostly on the augustifolia and if you need lavandins for your product line then do that, but they will definitely need to be covered over the winter. Raised beds is a good idea in that soil type.

    HAROLD: You should get rid of the grass where you are planting or it will choke out new plants.

    HEATHER: Mounds can help but grass is very pervasive.

23. **First year grower also – getting plugs – is it ever an okay idea to plant close together in Year 1 and then transplant (recommended/long term space) in Year 2?**
SEAN: It can be done, but it is quite damaging to dig up a woody plant and move it. If it's small it's probably okay if you can get a solid root ball with it. You are damaging it and setting it back compared to just putting it in there and letting it grow. If it is a case where you are having to hold plants and can't put them in the field yet, then you can plant them closer and then dig them up and plant them later. Keep it in mind when you are transplanting the plant after one year of growth some of the plants are about a foot or more in diameter and the root ball would be in equal size. You have to think about what you are planting it into. If you are thinking of planting it into a plastic mulch, it is going to be difficult to get it in there without damaging the root ball or damaging the plastic to the point that it is not helping for weed control. You have to dig such a big hole in the plastic and dig such a big hole for the root ball that it is going to be an issue. If it wasn't for the plastic, then it can be done.

24. **Is the Phenomenal Lavender included in your comments of pruning a lavandin? Or can they be pruned more to the wood like the Angustifolia?**
SEAN: I don't recommend pruning down to the wood period. It is best never to prune down to the wood. Phenomenal is just the same as any other lavandins in terms of how to handle it. If you cut it down the wood it would die. If you watch my presentation on the Phenomenal that I have in my trial, you cannot tell the difference between Phenomenal and Grosso in my plot. Not in a single aspect. Phenomenal is supposed to be a genetic mutation of Grosso. Phenomenal is exactly the same treatment as Grosso and as far as I can tell, I cannot tell the difference in winter hardiness. It may be that some of the Grosso plants are poor in that maybe there is disease that is being transferred with the Grosso by some propagators and that is why Phenomenal looks better to a lot of growers, but it definitely requires more investigation.

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We had 4 sources of Phenomenal and 4 sources of Grosso and 2 of the Grosso's died over the winter and the other two look exactly the same as the 4 Phenomenal sources that I had.

25. **Do you know if lavender is a plant that does not grow under black walnut trees?**
SEAN: No, I cannot find any reputable information on this. Given the lack of information, it is best to assume that they will be affected. Lavender would not grow anyway in the shade of a black walnut. If you are further away from the trees, the only way to ensure the effect is minimized would be to drag a subsoiler (deep shank that is normally used to break up a plow pan, or layer of clay that prevents infiltration of water) between the lavender field and the trees, to break off the roots that extend that far. This would have to be done annually. You also need to ensure that nuts or leaves do not stay on the lavender field. It can take up to 2 years after severing roots for the juglone in the soil to break down fully.

26. **What is your success rate on propagation in the spring? Does anyone do it in spring? I know many farmers prefer fall.**
SEAN: I have done it in the spring and had okay success. The advantage of doing it in the spring is that the plant is very vigorous. The caveat being right now you don't have a lot of plant material. A lot of time you wait until get you get a spike, then you do the cutting. But that cutting is going to want to bloom and you want to cut that off. It's not the ideal time to do it, but it's not the ideal time to do it. I have done it and it is usually fine. Just keep cutting the blooms off and eventually it's fine. Because you have long daylights now it actually moves a bit faster at this time of the year. The ideal time to propagate is probably August when you have that new flush of growth after bloom and you have lots of time to get it rooted, you can do it outside, you can transfer it to pots and potentially it could be held either outside or in an unheated building in a very sheltered location with row cover overtop of them.

27. **I just had 4" pots of Munstead and Folgate cutting delivered a few days ago for planting this year. I wasn't planning to plant them until closer to mid-late May – after the comments about getting these into the ground quickly, what is the best plan on planting these? I'm a little further North (an hour west of Ottawa)?**
SEAN: If they are hardened off, some nurseries keep their plant material sheltered over the winter but cold so they are dormant. If they are adapted already to the air temperature in that they were kept outside to this point, then they can be planted at any time. Most of the time if they just came from a greenhouse, you will want to keep them from freezing. Keep them until the risk of frost is past. Try to avoid them getting frost and then plant them.

HAROLD: 4" pots are not as dangerous to keep as 1" plugs. Watch the watering. Not too much especially if kept in a cool place. Don't dry them out.

28. **Should 4" pots be kept outside unless there is a danger of frost?**
HAROLD: Yes, if they have been hardened off. If it's not too cold. If rain does not interfere with watering too much.

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29. Does anyone know where to get pink lavender?

SEAN: There are a number of pink varieties. I don't normally comment on where to get them because I do not want to promote one propagator over another. Below are the options in my plot. There is one more that didn't bloom. Most of them are close to white. Rosea was the most pink that I have in the trial. There is also Pink Perfume which I have in the trial, but didn't bloom last year because it was young. Melissa is slight pink hue as well. Ellagance Snow and Artic Snow are pure white. They are the only two that were pure white. Ellagance Ice has a very slight tinge of pink and Ellagance Pink. I joined the Great Lakes Lavender Conference a few weeks ago and they were talking about a variety called Miss Katherine and it is truly bright pink. It is a much brighter pink than any of those in my trial. You may have to go to a U.S. propagator to get those.

HAROLD: Of those varieties, there are no pink buds. If you dry these for buds, once all those petals fall off, you have a bunch of green buds.

SEAN: I would plant pink varieties exclusively for oil or for looks. The buds are green. They do not look good at all. The bundles are not going to look good. When you are selling lavender, you are selling the buds. The flowers are going to fall off. That's why we recommend when you are selling for buds or bundles, you harvest right at the beginning of bloom. You want as many buds to be fully mature as possible, but you don't want too many petals to be open because they are going to turn brown and stick to the bundle. Right in the first week or so of bloom, it is probably the best time to do that. Melissa is the most vigorous grower of any of these. It is a very hardy vigorous plant. It also has a pretty good oil yield and is very good for culinary purposes. Although it doesn't have the purple buds, it has a unique, less pungent sweeter quality to it. It is very winter-hardy as well. Ellagance Snow is very vigorous too. Some of these plants were too young to come to any conclusions as well, but the Melissa is a go-to for colour contrast.

JAN: There is a grower in Texas who has Miss Katherine, but he will not ship to Canada.

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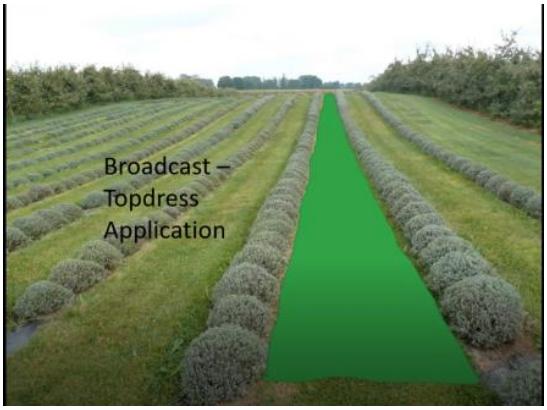
SEAN: Growers yes, but there may be propagators in Michigan who may be willing to. I do not recommend sending anything illegally over the border without an import permit.

30. **You recommend 80kg/hectare of Nitrogen fertilizer. What time of year is best? Is more than one application better?**
    SEAN: More than one application is better if you have the option. You could do it all at once. If I was going to do it all at once, I would probably do it in a June timeframe. When we did the trial, it was done in early June, early July and early August, so it was a split application. It was 27 kilos in 3 applications. You get a huge amount of growth in the spring for the bloom, so there is some fertility required then, but you also want some fertility after the bloom because you want all that vegetative growth for the next year. A split application is ideal for that. The total for the year would be 80-100 kg/hectare. If you have applied it to a sandy soil and then you have 3 inches of rain the nitrogen will wash away, so sometimes you may have to add to that total if you have any heavy rains.

31. **How do you calculate the acres?**
    SEAN: I like to calculate in hectare's because it is a much easier calculation because everything is nice round numbers. The complication of lavender is that the plants are not occupying the whole area at some points. When they are in full bloom, the width of the plant at that point is probably the ideal fertilization zone. Generally, the area would just be length times width. In this case, if you are ignoring the grass between the rows, you might only be considering a third of the area as fertilized zone. You would divide the total area by that. It depends on what you are fertilizing. If you didn't have the grass there and it is just bare soil, then you are sidedressing (just putting a strip of fertilizer down each side of the plant), you would just calculate the area that the plant occupies and ignore the space in between. In the image below, there is not a lot of area between the plants and in most cases, growers have more space between the rows. If you have grass between the rows, I would add a little bit on each size because the grass close to the row will use some of that fertilizer. The challenge is how to get the fertilizer there. If you have a drip irrigation system, it's fertigated right to the plants that's the ideal. It's the easiest way to get it there, then the grass that's close to the row gets a little bit of fertilizer. There is the option if there is grass between the rows to consider it all fertilized area and broadcast your fertilizer over the full area. In that case you would calculate the whole area which is length times width. Fertilization is a complicated topic.



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32. **Can I plant lavender in a raised garden bed where tomatoes had been growing for years – filled with triple mix?**
    SEAN: High organic matter content is not ideal for lavender because it may hold too much moisture. However, having a raised bed would probably compensate for this, so it would probably be okay.

33. **Should you fertilize first year 4" and plugs too? Liquid to plant?**
    SEAN: The first year your plants are very small. First thing to do before you plant them is to fertilize with phosphorus and potassium ahead of time. They don't move much and it is very difficult to get them to the roots once they are covered. Generally, preparing the soil you take a soil test, you submit it for the standard soil test. They test for potassium, phosphorus, PH and others. It's in the presentation and there are some resources for how to interpret those soil tests. You can also send them to me if you are confused and I can help you through that process. That would be the first step. When the field is empty you can cultivate those fertilizers into the soil and then you don't have to worry about as much beyond that. For the plugs, I would suggest just having a transplant fertilizer solution. Get a water-soluble fertilizer, follow the instructions for a one-time fertilization. Make sure you follow the concentration on the bag because if you go too concentrated you can burn the plant. Fertilize in the planting water as you are planting. That would cover you for the first month or two and then you can supplement that with further fertilization. You can increase the dose as the plants grow. So maybe fertilize again in July and August.

34. **In regards to soil amendment, is mushroom compost okay to supplement clay and sand soil?**
    SEAN: With a clay soil, it is important to maintain good soil structure. This can compensate for the poor drainage in clay by allowing the soil to clump up into larger particles. The addition of organic matter can help with this. However, too much organic matter in a poorly drained soil could also encourage root rots, so the addition of organic matter needs to be accompanied by good drainage. Mushroom compost would be fine if the drainage is there. However, never till the soil when it is wet or you will destroy the structure and compact the soil. Soil should easily crumble when squeezed in your hands before you should till.

35. **Can you speak to using a slow-release Nitrogen granular fertilizer? Is it done once per year and can it be applied directly to the plant or is there risk of burning the plant? Or directly to the "hole the plant is growing in" in the plastic mulch?**
    SEAN: If you get a high-quality slow-release fertilizer, there is less chance for burning then if you get a cheaper one. For example, sulphur-coated urea is one of the cheaper ones. In my trials, I found that about 60% of the nitrogen came out in the first week and another 20% into the season and another 20% is still intact at the end of the season. It is not as controlled as you would expect. The higher quality ones may last a little longer. You may get a flush of nutrients right at the beginning after applying it. I would be hesitant to put them right at the planting hole right next to the crown. That's probably not a good idea. If you were to broadcast it over the whole area at 80kg/hectare, then that would be not a bad way around that.