

Ep 98: Viticulture: The annual growth cycle, understanding your meso-climates, and soil structures and nutrients (Part 1)



Janina Doyle 00:00:07 Welcome to Eat Sleep Wine Repeat, a podcast for all you wine lovers, who, if you're like me, just can not get enough of the good stuff. I'm Janina Doyle, your host, Brand Ambassador, Wine Educator, and Sommelier. So, stick with me as we dive deeper into this ever evolving, wonderful world of wine and wherever you are listening to this, cheers to you!

Hello to all you beautiful wine lovers of the world. And welcome back to another episode. So today we're gonna tackle viticulture, actually understand how the vines grow in the vineyards and the choices made as to why you would plant a variety or where. So what inspired me with this episode, some of you who are following me on Instagram @eatsleep_winarepeat There you go. There's a plug if you're not. You would know that I've changed jobs recently. So, yay. I am now officially in the English wine world, the English wine movement. I've talked about English wine on so many of my podcasts. And in fact, even bigged up the specific winery Balfour in Kent. And that is exactly who I am working for now. So very, very excited to be their brand ambassador. Now, part of my job, very excitingly is I get to do some of the tours. This is amazing. This winery by the way, is about an hour from my house. So, you know, anyone who wants to do some, uh, digging around, you can see what radius, where I might live. And going down to the winery, this beautiful winery has 100 acres on the property. So that's about 40 hectares for those of you who prefer hectares. It is surrounded by ancient woodlands, which actually creates a microclimate. The vines are grown on clay soils. So not chalk or green sand, as many of the other wineries in England are talking about. That's the very exciting idea of soils being very similar to what they have in champagne. But there's pros and cons of all, as you may and may not expect. And so I want to take you through discussing how canopy can make a difference, the rain, um, water, lake, sea, rivers, how they affect the vines growing and soil types, altitude, the list goes on. So I'm not sure if I'm gonna fit this into one episode, we're gonna see, I'm gonna talk. I'll see how long I talk for. At some point I'll stop. And, um, we'll see if there's a part two. So stay with me and I want to take you into this quite exciting world. And hopefully it makes learning easier for you in the future. If, when you hear people talk about, oh, it's a maritime climate, or it's a continental climate. So we're gonna touch on all these things and I'll try, I can't promise anything, but I shall try to make it interesting as we go along. So let's go into details.

Janina Doyle 00:03:22 So firstly, I wanna start with the vine itself, all Vitis vines, whether it be Vitis Vinifera, you've heard me mention this many a time. This is the most common grape variety. The species that we know. So this is your Cabernet Sauvignon, your Sauvignon Blanc. Most of the grape varieties you've heard of. But then we've touched on varieties, species should I say, such as Vitis Labrusca or

Riparia. And these are commonly known in America. So all of these different Vitis species, these grape vines belong to the Vitaceae family. Some people I've heard say Vitaceae. So Vitaceae, Vitaceae, which is basically a climbing plant, a woody climbing vine with, with tendrils that produces fruit. So this is the family that the lovely grapevine that we adore belongs to. Now the annual growth cycle. I'm gonna talk about the Northern hemisphere because that's where I am. But all you need to do is literally go six months further if you're thinking about the Southern hemisphere. So always in April going to May time. This is when we have bud burst. So what happens during the winter, the vine is dormant. So it has all these carbohydrates, these energy stores, but nothing happens. Now when the average temperature becomes above on average 10 degrees Celsius, this activates the energy, the plant wakes up, sending carbohydrates up the trunk, which is the permanent wood. And then along the cane. Now what the cane is, there may be one, there may be two. It depends on what the Viticulturalist wants to do, but they used to be last year's shoots. So once all the leaves fall off in autumn, a Viticulturalist working the vineyards can decide to lay down one of these shoots or perhaps two, cut away all the rest and then this shoot hardens to become the cane. Now, along the cane, there will be, stay with me, nodes. Now, nodes are basically the bumps that come out of a vine shoot. Okay? And so when these carbohydrates hit the nodes, little buds will start swelling. And when they have swelled enough, they will burst. And this is what we call bud burst, not such an original title. So as I already mentioned, you should expect this to happen in April or May. Now, one of the worst things about this time is especially if you are in a very cool climate in places like Burgundy, in Champagne, in England, frost is a crazy problem. And if you get too many days of frost, your bud is going to be destroyed. Now there are secondary buds, if the primary ones are destroyed, however, these produce far less fruit and far less flavor. So you do not want this. So certainly frost is a major problem. Now fingers crossed you get through frost, May to August times the next few months, it's all about shoot growth. So out of these buds, you are gonna get leaves growing. That's where the bunches, the flowers come from and all the tendrils, so those little curly things that wrap around whatever they can find. Now, the flower is very important, cause this is basically the plants reproductive system or its structure should I say. So inflorescence is when the flowering occurs and it's worth pointing out, it's not bees that do the pollination here. A vine is actually hermaphroditic. So it has male and female reproductive parts. Now the flowering of the vine can take anything from between 40 to 80 days from when the bud originally burst. So it really does depend on the weather here. Certainly in England, it's very normal to have the flowering happening in end of June, early July. Now all being well, if it hasn't been raining too hard or too much wind, which could blow away the pollen, keep in mind, no wind at all wouldn't help with the stimulation of getting the fertilization to happen. So these vines aren't fussy at all, are they. Anyway, all being well by the end of this, you'll now have a cluster, a cluster of grapes that will swell and grow and get tasty. We would call that good fruit set. So you may have heard of the French term Coulure, and this is known as bad fruit set. When you are left with a very small crop based on bad weather. Now to make matters even worse, really bad weather at this point can affect next years grape crop as well because there are dormant buds on the cane. Now what they will go through is a process called floral initiation. And what that's basically gonna determine is the maximum amount of bunches per shoot for the following year. So hopefully you're getting an idea now how important the weather is, why vintage matters so much and why, well Viticulturalists are constantly praying that their whole crop doesn't get taken out in one night of hail, of frost, of crazy winds, of terrible rains, because it can happen. But moving on to brighter things, let's go to Berry growth and Veraison. So Berry growth is between July, when, of course you've got that cluster, through to September. So July to September is when the grapes will grow and swell, as I've mentioned. And

Veraison is when the grape will change color. So your white grapes will go more clear and yellowy and your black grapes will go red. Now during that time of Veraison, you're going to find that the grapes get more and more sugar and the more sugar that is accumulated in the grape, the less acidity there is. So again, as a winemaker or a viticulturalist, you could choose when to harvest your grapes based on how much acidity you want, or how much sugar. Now with fermentation, you may recall that sugar turns into alcohol. So it's maybe not a case of how much sweetness you want in your wine. The likelihood is that the winemaker is going for a dry wine, but the higher the sugar levels will mean, the end result of a dry wine will be a higher alcohol wine. So therefore the winemaker can decide what kind of style they're going for. And that will determine when to pick. However, picking typically is September. Even through to November, they may be looking for a real late harvest wine. It could be actually a dessert wine, certainly in England, quite surprising, we are picking very often in October. However, what with global warming climate change, sadly many European vineyards, they're starting to pick in August, which was never seen before a decade or two ago. Now sometimes a winemaker or a Viticulturalist doesn't actually have a choice when they pick, because the weather may decide for them. Rain is not something we want during harvest time. It can dilute the must if the rain comes before the harvest, it can cause the berries to split at the moment of harvest. So sometimes if a load of rain is coming, a winemaker may decide he's just gonna go in and pick the grapes beforehand. But of course, what that might mean is that they're just a little bit under ripe. So it's a really tough time for all people running the vineyards. Now let's just assume that we've had a perfect harvest and the grapes are tasty and juicy. They've been picked, they've gone into the winery and the wine is now being made. Hoorah. After this, the leaves will all fall off. Wood ripening will happen. And basically the vine will take all those carbohydrates, store them and then go dormant. And this is when winter pruning will happen. So generally between November to January. Now, if you are in a very cold region, like for instance, recently I've done the series on the Finger Lakes in New York State. During the winter, a vine could suffer freeze injury. So below minus 15 degrees problems really start and at minus 25 degrees Celsius, I might add, the vine is killed. It's game over. So as you may recall, from those previous episodes, they insulate with earth. That's that process of hilling up, but you could also insulate with snow. Now, thankfully that's in very few places in the world, but there are all different types of temperatures and climate. So I figure now's probably a good time just to touch on these.

Janina Doyle 00:13:04 So what I wanna do now is talk about the temperatures and the climates that basically you'll find around the world. So if ever in podcasts, if we're talking about a cool continental climate, you know what it means. So in terms of continental, this is typically an area that has hot summers, cold winters. So these are inland. So more extreme between summer and winter. Then if we mention that a wine region has a Mediterranean climate, warm summers, mild winters, less rain, the rain is in the winter. And obviously as we all know, lots and lots of sun, then if we talk about maritime climates, the wine regions are closer to the coast. So they have an impact from the sea, the differences between the hottest month and the coolest are much smaller. And they typically have quite a long growing season. So warm summers, mild winters, and actually quite a lot of rainfall because the sea brings a lot more cloud cover. So these are the three ways that we would differentiate in terms of climates. Then when we say it's a cool climate, we're talking when the average mean growing season is below 16.5 degrees Celsius. So this is England. Uh, it is Burgundy. It is Champagne. If we go to a moderate climate, this is something between 16.5 - 18.5. So now think of Bordeaux. A warm climate that's 18.5 to 21 degrees Celsius. That's the Southern Rhône and anything above 21 degree Celsius plus is just for table grapes. And you're not gonna find the grape varieties that we love in a bottle of wine.

Now I also just wanna point out, actually, if you are much further away from the equator, of course, the further you are away, the less tropical, probably the cooler climate you have. Now, they may sometimes have shorter summers, a shorter growing season, but still pretty warm summers. But what they do have to compensate is really long day length. So if you keep in mind, the further you are from the equator, the longer your days, this gives your grapes plenty of time to ripen. And in fact, they're typically less rainy, especially then maritime climates. So you have a lot less risk of rot during harvest. And so you may have noticed places like Germany or New York State, the Finger Lakes, up in the Niagara Escarpment, they are doing late harvest wines because they have quite dry Autumns, so that ends up being a benefit for them. Now I wanna talk about then Meso-climates because Meso-climate is within a site that climate could be very different based on altitude. It could be based on water that's nearby, or it could be based on slope aspect. So firstly, altitude. Every 100 metres you go up in altitude, it gets 0.6 degrees Celsius cooler. A great place known for its high altitudes would be Argentina. So Salta, especially in the north, incredibly high, 3000 meters high and down in Mendoza, very typically you can get 1500 plus meters where the Malbec is growing. Now up in altitude. Yes. Okay. You're gonna get cooler climate. So that might be great for your grapes, but there is typically more wind, so that may affect your bud burst taking longer. So you have to keep this in mind. Now, the mountains, they actually can be really protective from loads of rain and excessive winds. So a really great example of that would be Alsace, in the Northeastern part of France. To the west they have the Vogues mountains and this acts as a rain shadow. And actually this is the driest region in France. So get yourself a mountain. Now talking of those smaller mountains, those things called hills, let's look at the slope aspect. So first of all, very, very interesting. If you are after sunshine, a lot of sunshine, you may want to plant east facing. And the reason for that, the sun is much less scattered because dust in the air has settled overnight. But by the time the sun starts setting in the west, the sun is far more scattered because the dust has been lifted by the air, as it has warmed through the day. However, as the sun is setting in the west, it is actually warmer cause it's had all day to build. So that's all gonna be dependent on the grape variety that you're planting and how much sun it needs. And then you wanna decide where do you plant it on the slope? Now, if you plant a vine on the bottom of a slope, if this is a place like Burgundy or England, as I keep on pointing out, we have a lot of issues with frost and of course, cold air moves down, hot air rises. So basically you need to be really, really careful not to plant too far down at the bottom of the slope otherwise you're going to be having to light bougies. So frost candles. And if you can imagine waking up at 3:00 AM in the morning, going out with your team and having to light a thousand of them, apart from the timing, each one costs 12 pound a pop, not crazy, but when you multiply the costs and you may have 10 nights of frost. Last year in England, well certainly in Balfour winery where I'm working now in Kent, they had 20 nights of frost. So gosh, for those of you who like sleep, you do not want to be a Viticulturalist in a cool climate region with frost as a hazard. Now that is why in the Côte-d'Or, so we are talking in the Burgundy region, they plant in the middle slope. And of course they don't go higher than that because then above this area, it gets cold again. Now the positive of planting on a slope is they are better draining. So you don't have to worry if you're in an area that rains a lot, the soils typically are poorer and that's actually a good thing cause that moderates vigor. But you need to think about the fact that you are gonna have to hand harvest, so you cannot use machinery. So it's gonna be much higher in cost. And there is the risk of erosion. That is why in the Douro, Portugal, you can find all of these very special terraces. This is a way to mitigate the issues of erosion. And then finally, if you do not want any more cold air, an isolated hill is much better because if there are bigger hills around this hill, it's gonna bring cold air down. So these are the kind of decisions you want to make. Now bodies of water. So this is

rivers, the sea, lakes. Now they're great for cool climate regions because they can moderate the temperature. They can reduce the risk of frost. They reflect the sun rays and they can moderate the winter temperatures and store a lot of that autumn heat. Now also, if you're in a place where it's not raining enough, it can act as an irrigation source. It may be vital. And if you're in a place like Sauternes, in Bordeaux, where they make some of the best incredible dessert wines in the world. And they are reliant on the morning mists that come from the river and this will create Noble rot, Botrytis cinerea. This is a type of rot, a good one, that will create little holes in the grape skins. And then the grape itself will dehydrate, concentrate, become sweeter and then create these beautiful honeyed orange marmalade flavors that we adore. Now the one negative of course is humidity. So fungal diseases can be on the up when you are by a water source, Downy mildew is one of them. It can affect all green parts of the grapevine basically by creating rot. And then you lose so much of your yield, but equally rain also does the same thing. It can create mildew and grey rot. And I already mentioned how bad it can be if it rains directly at harvest. So, okay. That sounds all quite sad. Let's go to something more interesting. And I wanna talk about soil for all of you soil geeks, and those of you not, don't turn off. It's still quite interesting.

Janina Doyle 00:22:19 Now when searching for the ideal soil for your grape vine, typically it's been established that we want something with a quite thin top soil and then quite a well draining subsoil. So the idea that vines don't like wet feet, but at the same time, yes, you want your drainage, but many grape varieties need a decent amount of water access or moisture. So when we talk about top soil, this is basically what is going to support your root system. And then when it comes to the sub soil, this is all about how deep the vines can go, where they can collect the minerals and its ability to drain away the water. Now you'll often hear people talking about poor soils. Soils with low fertility. This is what we typically like with grape vines, other crops no, but here it controls the vigor. So obviously your canopy, this is all those leaves and shoots that are gonna grow out. Remember a vine is effectively a very tasty weed. It is basically a climbing plant. It is just gonna keep on going. So we need to control that growth, so the grape itself gets lots of the energy and not just the leaves. Now there are heavier soils and there are lighter soils. Now this is very much about the texture of the soil, the particles, how large or small are they. Now the smaller the particle, the heavier the soil will be. And the heavier soil is clay. Now this has the ability to hold onto water. Therefore makes it a colder soil. It will take longer to heat up. So these are all things you may need to know if you're in a cool climate or a place that doesn't need rain maybe. Now the positive is that it will hold on to more nutrients, which we like, but if it then stops raining and the soil dries up, it can crack when it becomes dry and then that could damage the roots. So it is actually a really good soil if it's mixed with perhaps a little bit more free draining soils, cause therefore it could aid some aeration. Now just quickly to go up in levels of heaviness, I guess the, the particles. Clay, as you know is the heaviest. Then it goes to silt soils, then fine sand, then sand and then gravel. Now a really good mix is loam. Loam is a mix of clay, silt and sand. So you have that ability to drain away the water, but to still hold onto the nutrients. Now I haven't mentioned chalk. Chalk, of course, everyone gets very excited with. Chalk is very similar to limestone. It's basically Marine animals. It's lots of shells and skeletons from many, many years ago and it's very, very free draining and quite alkaline as a soil. Now we like alkaline soils because they encourage the vines metabolism and therefore the grapes themselves keep really high acidity. But you have plenty of different soil types that you may have heard of. Perhaps granite, that's igneous rock. This was formed from solidified magma. Uh, it's free draining. It's hard and it's dense. A famous place for granite soils would be Beaujolais for anybody who likes to drink their Bojos. Then you have volcanic soils which are specifically formed from lava. Now they can produce some

incredibly interesting wines. Mount Etna on Sicily is certainly one of the most famous, but then there's also Lanzarote. A lot of the islands are growing grapes on volcanic soils. For me, it seems to give the wines a, a mineral, elegant character. And then of course there is slate. Slate used to be shale, but it was metamorphosized by heat and high pressure. So it's harder and slightly less porous than shale. You can find slate in the Mosel Valley, Germany now apparently because it's quite poor in organic matter and the roots have to get sent down between the sheets. Actually, that's what allows the mineral aromas in our glass to come out. Now there's so many different soil types, so it should actually reign it back in and actually go back to that conversation on alkalinity and acidity, cause actually it's quite interesting. Now we do like alkaline soils, but we don't want them to be too high because this can inhibit the intake of nutrients and encourage chlorosis. Equally what with a lot of sprays, chemical sprays happening in the vineyards, the soils are becoming way too acidic, which is a big, big problem. Especially across Europe. Therefore when the acidity level drops below five, aluminium then becomes available to the roots and acts as a poison killing the plant. This is when you realize how important nutrients and minerals are to the root system and to the vine. So actually I'm gonna geek out for a second. Everybody grab your pen. So if you've ever heard of anybody talking about calcium in the soils, this regulates the acidity, that kind of makes sense with the chalk and the limestone kind of soils that, um, always have that real finesse such as Burgundy or Barolo soils. They're famous for their limestone soils or again, Champagne. Potassium. Potassium in the soils regulates the flow of water and the sugar. So you're gonna get a more even ripening. Phosphorus encourages the root growth. So therefore ripening. Nitrogen literally after water is the most important nutrient for its health and its growth. Sulfur acts as an essential amino acid and gives enzymes and Magnesium is essential for Chlorophyll and it regulates the acidity and the sugars metabolism. So again, encouraging ripening. Now another thing that you need in the soils is organic matter. You want between about 3 to 10% within your soils. So this is coming from plants, animal remains and well poo, excrement. So this is all broken down into the soil by bacteria and by those lovely little earth worms, by mites and beetles and fungi, all the bugs. And this is called hummus. So it's a brown, black mixture that is going to help the soil structure. It will allow the soil to retain those minerals that we've talked about. It can actually give color to the soil which can aid in heat retention and it will help with the retention of water. So it's just filled with minerals and sugars and cellulose, starches and all that nitrogen that we need. Okay. What do you think? Is that enough today on soils? I don't think I've ever got so geeky on soils, but I don't know. I think it's super, super interesting. Right?

Janina Doyle 00:30:06 So I think I will do a part two of this. So hopefully you are all very excited, not thinking, oh no, not another episode of Janina rambling on. Uh, but we'll look at what grafting is, what is a graft and the different rootstocks you can use. And maybe we'll look at trellising and pest control and a few other things in the vineyard, but I'll give you a break. So next week I'm gonna bring you Melissa Worrell, who is a good friend of mine and a stage one Master of Wine student. So she's gonna be talking about her experiences. What she's going through, the trials and tribulations. And hopefully you'll learn a little bit more about what it's like to study at that high level. But she's also Australian, from Barossa Valley. So I've tasked her to teach us all about South Australia as a wine region, the specific, most famous wine regions and their grape varieties, where they are. And we're gonna compare some of the grape varieties, how they differ, the nuances between those wine regions. So don't forget to come back next a week. Now, of course, I leave you with a wine quote as always, this one needs to be about soils, doesn't it? So this quote is from Oliver Magny. So he has written some wine books, such as Into wine and according to one website, he's the founder of one of the best wine bars in Paris: Ô Chateau. And he said:

“Studying wine taught me that there was a very big difference between soil and dirt. Dirt is to the soul, what zombies are to humans. Soil is full of life while dirt is devoid of it.”

Okay guys, that is your lot for today. I hope if anyone wasn't a soil geek before this, maybe you're a little bit more interested in where the grapes actually come from. Love a bit of soil. Thank you as always for listening, do make sure you've subscribed if you haven't already. Like the podcast, share the podcast with your wine loving friends. And of course, if you are listening on apple podcast, please do leave a review and comment cause it makes the podcast more discoverable. Until next week, cheers to you.