Propagation of the Vine

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**LAYERING**

1. Definition:
	1. Vine canes are buried in the ground then separated from the parent plant once they have established their own roots.
	2. Layering occurs naturally and is how all vines propagate themselves
2. Advantages:
	1. Easiest way to propagate some species like V. berlandieri and V. Rotundifolia which is difficult to root from cuttings.
3. Disadvantages:
	1. Not easy to organize vineyard when you use this method
	2. Must be in phylloxera-free soils in order to work; these are currently rare
	3. If the plant is diseased, layered parts are, too

**SEEDING**

1. Definition:
	1. Planting seeds of grapes
2. Advantages:
	1. May produce a plant that is inherently unique; this may be advantageous eventually
3. Disadvantages
	1. Slow as molasses
	2. Does not allow for grafting onto rootstocks of any kind
	3. Because grapes reproduce sexually, difficult to predict characteristics of new vine

**CUTTING**

1. Definition:
	1. Cuttings are pieces of parent plant (stems, roots, leaves) that develop into a new plant when placed into the right conditions.
	2. Vines can be grown from 2 types of cuttings: Dormant/ hardwood OR green cuttings.
		1. Dormant Cuttings
			1. Definition: Hardwood winter cuttings made from the new shoots (canes) that grew the previous season. These can be taken anytime after the vine lost its leaves until the buds begin to swell in the spring
				1. WHY: highest levels of carbohydrate reserves in autumn or winter
			2. Ideal propagation techniques:
				1. The best wood is the first 1-2 feet of the base of the shoot where the buds are the closest together.
				2. Ideal thickness: pencil diameter, 3/4”. Thicker cuttings are hard to handle, thinner wood may not be mature unless variety has naturally small shoots.
				3. Best is clearly healthy exterior, with dense, light green inside, and relatively small pith. When cut the cell layers just beneath the bark should be green and full of sap, the wood firm and free from dark specks.
				4. Should be 12-18” long, bottom straight cut right below the bud, top cut diagonally at least 1/2” above the bud to make it easy to identify the top.
				5. 4+ nodes preferable, 2 if clearly healthy

WHY: Rooting occurs best at the nodes, advantage in having several nodes per cutting

* + - 1. After cutting vine:
				1. Disinfect cuttings with a 5% hydrogen peroxide solution before growing them to keep disease from spreading.
				2. Store at 5C before grafting
				3. They can be heat treated by placing them at 50C for 30 minutes in order to rid them of pests like phylloxera, nematodes, and phyloplasmas.
				4. If cuttings are not grafted, they can be planted out straight into a nursery or into a pot in a greenhouse.
				5. To encourage growth:

Plenty of water as the leaves grow faster than the roots.

Mist propagation or a propagating frame. -Keep them warm, 15C-25C.

Best to heat from below to encourage root development.

Use loose, well-drained soil or potting compost that has good aeration, a high water-holding capacity, good drainage and protection from vine weevils (a beetle).

* + - 1. Storage of cuttings:
				1. Wrap in moist paper or pack them in a damp peat in a plastic bag.
				2. Keep cuttings refrigerated or stored in an unheated building in a crawl space under a house.
				3. Avoid places where they will freeze (Freezing will not harm them, but will dry them out) Ideal temps 32-33F
				4. Can be held for a year or more.
				5. Large quantities can be stored in sand pits to prevent water logging upside down with 6-18” of sand covered with tarps and boards.
		1. Softwood cuttings
			1. Used for research.
			2. More difficult to propagate but are available all year round
			3. Also used when some grapes that don’t root easily from dormant cuttings

**CALLUSING** **CUTTINGS**

1. Definition:
	1. Callus is the white tissue that forms on cut surfaces. It is from callus that roots form. A non-precallused cutting placed in the soil will sit until the soil is warm enough for callus to form, so it only grows a few inches the first year, whereas pre-callusing vines before planting will ensure that they grow much more. A callused cutting planted in its permanent location can often grow enough to bear a cluster or two the new season.
2. How to Callus:
	1. Method 1
		1. Lay cuttings down in moist paper or sphagnum in a black bag
		2. Put in a warm area that stays constantly at 80-85 F. Callusing should occur in 1-2 weeks
		3. Plant as soon as roots start to appear.
		4. Decent video: <https://www.youtube.com/watch?v=ke0-8uuipHA>
	2. Method 2
		1. Plant cutting (straight up) in a pot of 3:1 perlite to peat
		2. Set pots on heating mat set to 85F, in a cool area or outdoors. Heated zones encourage callusing but top of the cuttings will not push buds with the cool air.
		3. The idea is to establish roots before buds push too much as there is an existing root system to support new growth. -Rooting occurs in 1-2 weeks.
	3. Method
		1. Plant cuttings in a black pot in 3:1 perlite-peat mixture and set in sunny location to be warmed by the sun in pot no larger than 1 gallon. Avoid excess watering as that will cool the soil and slow rooting
		2. Slowest method (one month or so)

**ON-SITE ROOTING OF CUTTINGS**

1. Completed after all danger of frost is past and weather is consistently warm.
2. Soil at the site must be tilled and clean of weeds
3. How To:
	1. For each vine, put down a sheet of clear plastic mulch, 2’x2’, a week before planting. The clear plastic allows sunlight to the soil and traps the heat.
	2. After a week, prepare cuttings with Dip N Grow
	3. Push cuttings through the plastic at least half way into the soil
	4. 1-4 weeks cuttings should root and begin to push buds
	5. Vines can be watered and fertilized after shoots are 6” tall.
	6. The new shoots can be trained up a support stake as they grow.
	7. The new vine may get big enough to bear a small crop next season.