GROWERS CHECKLIST MUSCADINES

Establishment:

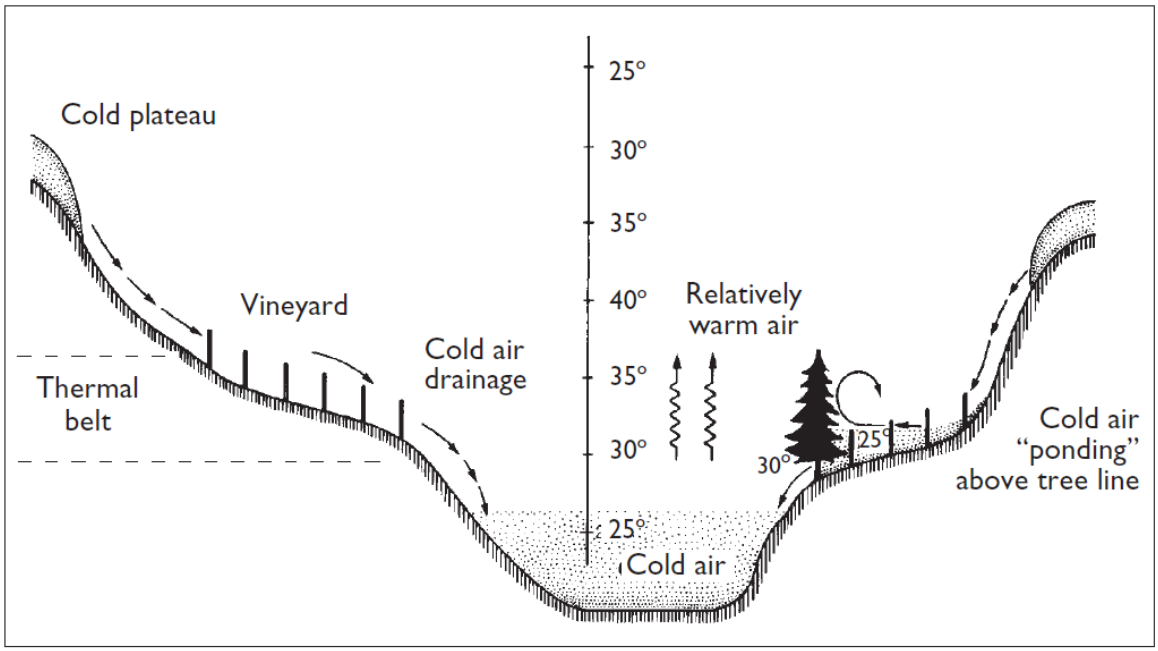
Trellis and Distances:

- 20 feet between posts
- Single wire 5 ½ - 6 foot high (12 - 9 gauge)
- One plant per post, planted ca. 2 foot next to a post.
- Train two cordons per plant (each arm is 10 foot long)

Processing (wine making) cultivars are different from fresh-market cultivars

Cultivar	Type	Fruit Color	Fruit Size	Cold-hardy	Season
Wine and Juice					
Carlos	Self-fertile	Bronze	Small-Medium	+	Mid
Doreen	Self-fertile	Bronze	Small-Medium	+	Late
Magnolia	Self-fertile	Bronze	Small-Medium	+	Mid
Noble	Self-fertile	Dark	Small-Medium	++	Mid
Fresh Market					
Black Beauty	Female	Dark	Large	++	Early-Mid
Black Fry	Female	Dark	Large	++	Mid
Darlene	Female	Bronze	Large	-	Early-Mid
Early Fry	Female	Bronze	Large		Early
Fry	Female	Bronze	Large	++	Mid
Granny Val	Self-fertile	Bronze	Large		Late
Hall	Self-fertile	Bronze	Medium-Large	-	Early
Ison	Self-fertile	Dark	Medium-Large		Mid
Lane	Self-fertile	Dark	Medium-Large	-	Early
Late Fry	Self-fertile	Bronze	Large	++	Late
Nesbitt	Self-fertile	Dark	Medium-Large	-	Mid-Late
Oh My!	Self-fertile	Bronze	Med. seedl.	-	Mid
Paulk	Self-fertile	Dark	Large	-	Mid-Late
RazzMatazz	Self-fertile	Pink/Red	Small, seedl.	-	All year
Summit	Female	Bronze	Medium	+	Early-Mid
Supreme	Female	Dark	Large	-	Mid
Tara	Self-fertile	Bronze	Medium-Large	-	Early-Mid
Triumph	Self-fertile	Bronze	Medium	+	Early

Site Selection:



Important:

- Avoid hard soil layers (0-40 inches).
- Adjust **pH to 6.0-6.5**
- Stay away from areas that get frequently flooded
- Remove weeds, clods and stones from field.
- Start working on the land min 8 months before planting the vineyard (commercial)

Nomenclature:

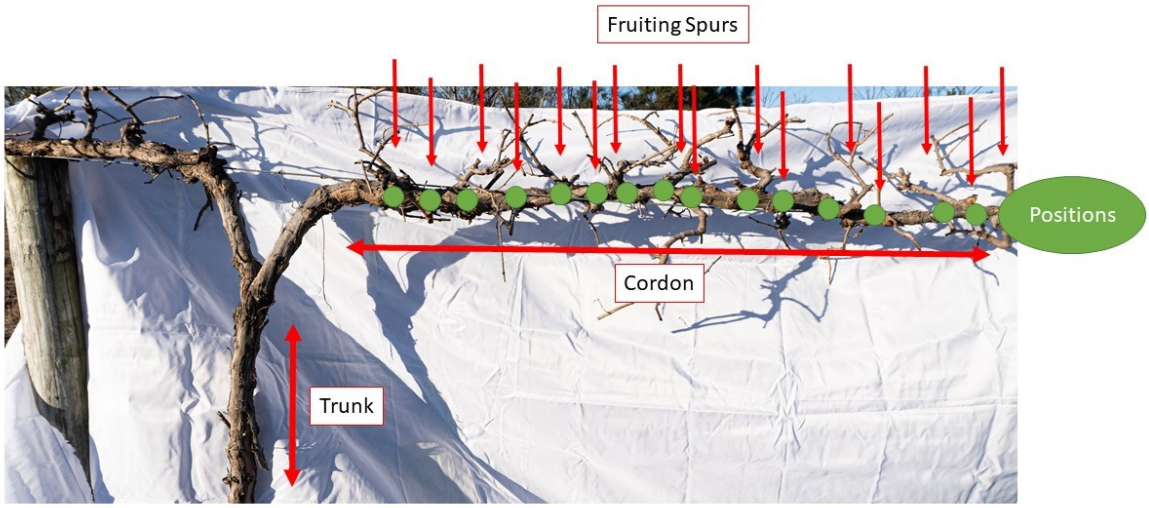


Fig:1 *Typical bi-lateral cordon high-wire training system for muscadine grapes.*

Trunk, Cordon and Spurs are permanent structures of a vine, which means they are wood that is older than one year!

Trunk: The trunk is a permanent wooden structure that grows from the root system to the wire. Usually a muscadine has one trunk over its lifetime.

Cordon: Cordon is the permanent wooden structure that is established along a trellis wire, a pergola or any other supporting structure. Cordons originate from the trunk and carry structures that bear one-year old, fruit bearing wood.

Spur: Spurs are permanent structures **established at positions** along a cordon. Spurs carry one-year old, fruit bearing wood. Spurs along a cordon are supposed to slowly gain in size over the years. Too fast growth of a spur can lead to Anklers and subsequent loss of positions along the cordon.

Muscadines are trained as a bi-lateral cordon system on a single high-wire. Bi-lateral means one cordon is established in each direction along the wire. Single high-wire means one wire in 5 ½ - 6 feet height is used to train the whole vine structure.

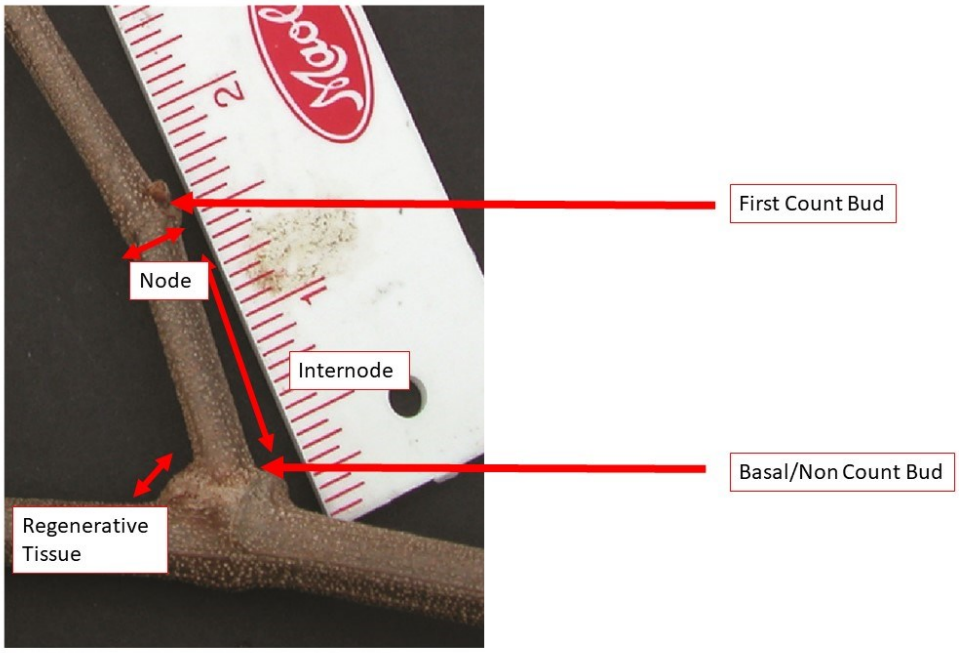


Fig.2: Explanaition of Node, Internode, Basal Bud and First Count Bud

In vines we usually count the buds on one-year old wood. Muscadines can bear from 35-40 buds/foot of cordon (e.g. Carlos) to as little as 25 buds/foot of cordon (e.g. Supreme). If we counts buds, we do not count the basal bud.

Buds are located at nodes and oriented opposite of each other. Nodes are physical barriers inside one-year old wood. Pruning decisions will decide the growth of your spur.

Basic Physiology

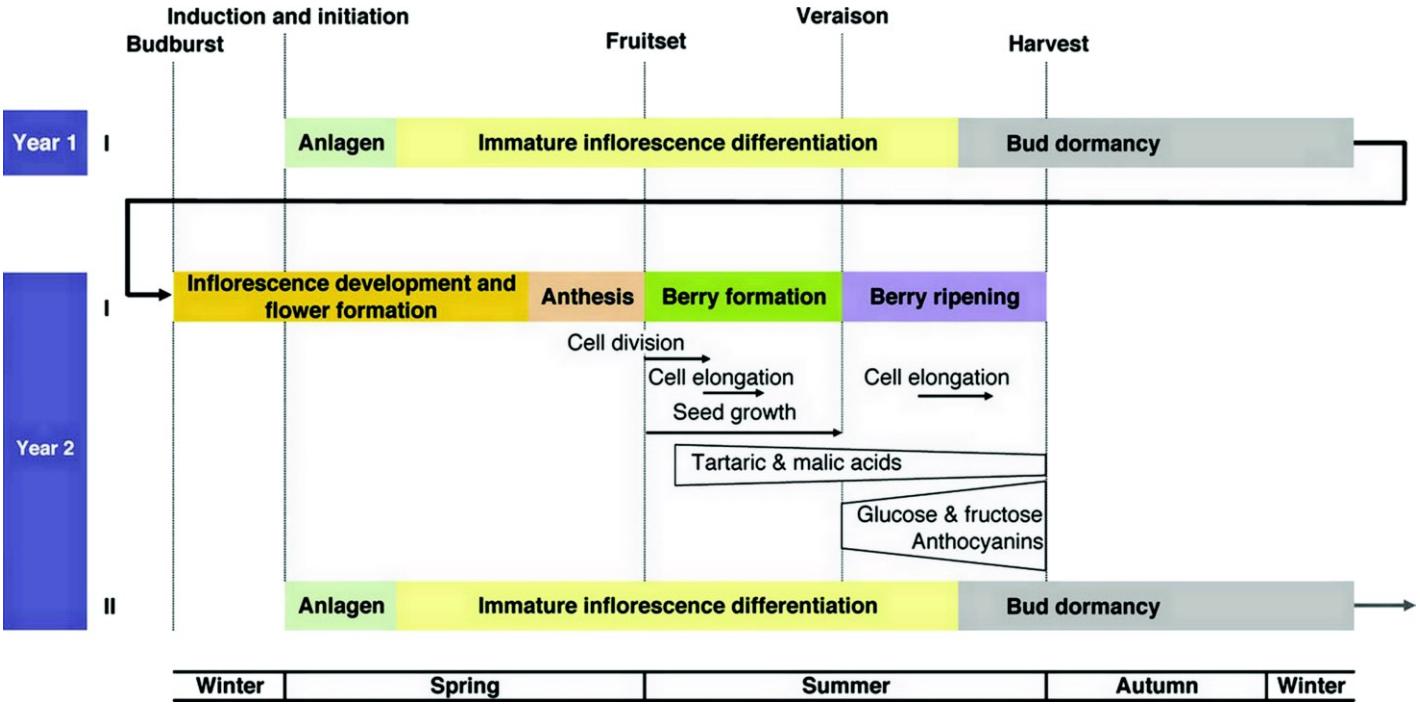


Fig 3: The fruitfulness of a bud is determined by environmental factors in the first year and in the first months of the second year.

Pruning decisions impact wood formation and growth direction on a grape. Those factors have an impact on fruitfulness in the second year.

Fig. 4: Cuts through a grapevine infected with trunk diseases. Left: A pruning wound that could heal. Right: Pruning wounds that could not heal and let to infection of the permanent structure.

Pruning creates wounds that are entry for fungal pathogens (trunk diseases). Trunk diseases can cause severe damage. Grapevines have physical barriers (nodes) that, if pruned correctly, will allow the tissue to heal and not to lead to infections on the permanent structure.

Basic Pruning Rules

- Try only to prune one-year old wood and dead wood!
- Leave approx. the length of the wood width to heal
- Don't do diagonal cuts
- Keep established spur positions along a cordon
- Number of buds/cordon correspond to overall vine vigor: the more vigor, the more buds can be retained.

Fig 5: A 7 year old muscadine vine that spurs established in all fruiting positions

Fig. 6: A grapevine that has long anklers, but several fruiting positions missing (photo: Mack Johnson).

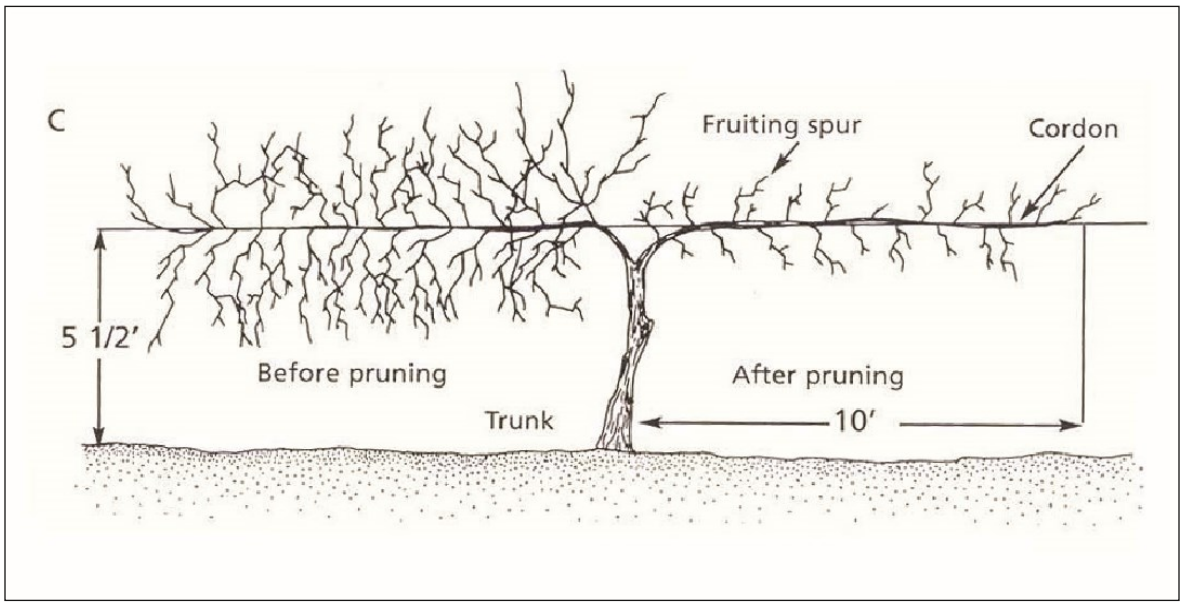


Fig 7: Fruiting Spur Positions Diagram

Fig. 8: A vine reflects the history of the pruner. In this example, several pruners have pruned differently every year, making cuts short to the base or left wood to heal, but did not come back to cut it off. This year, the pruner cut living wood close to the spur base, leaving a wound for pathogens to enter the permanent structure.

Summary Seasonal Chores:

Januray/February:

Pruning/Sanitation

- Prune when plants are still dormant. Depending on the cultivar, leave about 25-40 buds per foot of cordon on 4-5 healthy spurs. Try to select alternating spurs with healthy, pencil think, brown-golden colored wood.
- Prune out dead wood as much as you can
- Pruning should be done end January (East) and end of February (Piedmont) latest.
- Remove dead plants.

Pest and Disease Management

- If heavy black rot, bitter rot, Angular leaf spot or Powdery Mildew pressure was observed the previous season, treat with Mancozeb
- Sanitation and pruning of wood with trunk diseases is important
- Pruning wound treatment with Topsin, Borax and/or VitiSeal is advisable
- Consult the Muscadine Production Guide: http://www.smallfruits.org/assets/documents/ipm-guides/Muscadine-IMG.pdf

Weed Management

- If vines are older than 1-2 years, Glyphosate end for February (in coastal plains) – mid March
- Consult the Muscadine Production Guide: http://www.smallfruits.org/assets/documents/ipm-guides/Muscadine-IMG.pdf

Deer/Animal Management

- If high deer pressure is expected, a deer fence should be installed before bud break.

Other **Considerations**:

- Renew your **North Carolina Muscadine Grape Association** membership.

March - June (Bud break until fruit set)

Fertigation/Fertilization and Frost

- Monitor weather forecasts closely, consider a subscription to a custom weather report/service (AWIS, Accuweather)
- Even with custom services, your **local conditions can be quite different**. Check hourly air temperatures and dew points in the field, so you can respond to your actual conditions.
- **There is still potential for damaging frosts in April, so watch weather forecasts closely**.

- If you plan to fertigate (apply fertilizers through drip line), inspect drip irrigation setup including pumps, filters, lateral lines, drip connectors and perform a “wet” run to address leaks prior to injecting fertilizer. Time the first N injection within a few weeks after new growth has started.
- If you broadcast fertilizer, wait until mid – end April before broadcasting fertilizer.
- To ensure your fertility program is providing adequate nutrition throughout the season, send in **full leaf samples** and **soil samples** and adjust fertility accordingly.
- Rates of spring nitrogen and phosphorous applications will vary based on soil type and growing conditions.

Other considerations

- Even when things appear to be looking good, try to get your county agent or regional agronomist to visit. You can find your local agent under: https://www.ces.ncsu.edu/. They can be a useful set of second eyes that can provide you with either a confirmation of “all is good” or may spot something that could be a developing problem. You are all a team and strengthening the internal network is always a good thing!

Pest and Disease management

- Fresh market: frequent control with Mancozeb (66 dPHI) and Captan advised
- Processing: Depending on history of vineyard

JUNE – SEPTEMBER (Post-fruit Set – Veraison - Harvest)

The main muscadine chores for June and July are: canopy management, weed management, disease and insect control. Fertilization might also be required. Scout frequently (minimum once a week) for insect, disease and environmental problems.

Canopy Management: Muscadine canopy management can be critical to the success of your crop. Hedge the first time in late June/early July and, with vigorous varieties, hedge again in August. Some varieties will require skirting as well: Please make sure that shoots at the edge of a cordon don’t grow into the neighboring vine. High yielding, but low vigorous fresh-market varieties (e.g. ‘Supreme’) might require fruit thinning as well. Please make sure that you don’t overcrop those varieties.

Disease Management: Fruit rots (black rot, bitter rot, ripe rot, macrophoma rot) as well as angular leaf spot can be problematic and often need to be controlled. Good sanitation and canopy management will lower chemical input. Try to remove affected fruit as early as possible and scout frequently. Manzate products (e.g. mancozeb) 1.5 lbs – 4 lbs / acre should be used to prevent outbreaks in up to a 14 day spray routine. Mazate products have a 66d PHI and should not be used after June. Other effective cover sprays should include tankmixes of Topsin M/Rally with Captan/Pristine or Flint. Good canopy management and sufficient spray equipment (airblast/high pressure sprayer) are essential to have effective control of fruit rots. Please rotate fungicides

between FRAC codes. Please see the Southern Small Fruits Consortium website (www.smallfruits.org) and download the Muscadine Grape Integrated Management Guide.

Pest Management: Marmorated stink bugs, Japanese beetles and the grape berry moth can be problematic in vineyards. Please scout for those insects before applying insecticides. Danitol (10-21 fl.oz/ac) and Imidian (1.33-2.125 lbs/ac) will control stink bugs, Sevin (1.25-2.5 fl.oz/ac) and Danitol will control Japanese beetles. Sevin and Entrust (4-8 fl.oz/ac) will control the grape berry moth. In case you need to use insecticides, make sure to rotate between IRAC codes. Too heavy insecticide use can increase spidermite populations. Please see the Southern Small Fruits Consortium website (www.smallfruits.org) and download the Muscadine Grape Integrated Management Guide.

Grape Root Borer: The grape root borer is one of the most dangerous insect threats to muscadine vineyards. The larvae of the borer can feed through the roots for one to two years, leading to die-back and often die-off. The adult root borer lives as a moth and mates in summer. Adult grape root borer populations in North Carolina often highest end of June/all of July. There are three control options. Each muscainde vineyard should monitor root borer activity during this time using Phermone traps (one trap per 1-2 acres). Mounding or covering the soil will help to reduce the amount of egg laying, Lorsban will control larvae stages, and Isomate GB can effectively disrupt the mating of adult root borers. Mating disruption (Isomate GB) is very effective but expensive and is only one part of an integrated approach to pest management. Use 100 dispensers per acre. Lorsban has a 35PHI, and need to be applied as soil drench (4.5pt/100 gal of water). Please see the Southern Small Fruits Consortium website (www.smallfruits.org) and download the Muscadine Grape Integrated Management Guide.

Weed Management: Please make sure that you keep your row middles mowed at all times. Not very well managed row middles can be a source for insect pests (e.g. marmorated stink bug) and several diseases. Make sure keep weeds under the vine to a minimum. To chemically control row middles in a mature vineyards, use Paraquat, Glufosinate or Poast as needed. Please see the Southern Small Fruits Consortium website (www.smallfruits.org) and download the Muscadine Grape Integrated Management Guide.

Vine nutrition: Take a tissue samples (petiole and leaf blade). Use the newest fully developed leaf on a fruitful shoot. Take 40-60 samples per block and variety and send leaf samples to the North Carolina Department of Agriculture and Consumer Service, Agronomic Division. (http://www.ncagr.gov/agronomi/uyrplant.htm). Apply fertilizer according to the sample results (NPK fertilizer such as a 10-10-10 or a 6-6-18 can be used).

OCTOBER

- **Harvest:** We had a year with exceptional high yields, and some varieties were producing for a longer period of time, and more fruit than expected. You should be almost at the end of your season in the Coastal Plains with probably one or two weeks more to go on late fresh-market varieties. This means your vines used a lot of energy to produce this years crop. Please follow the recommendations below to make sure you give your grapevine the opportunity to rest and allocate nutrient and reserves to the root system before dormancy.
- Make sure to scout berries for disease and treat accordingly (see B. Clines article)
- **After harvest:** is a good time to scout your vines for damages and symptoms. Especially damages caused by dead spurs or cordons should be scouted and marked. If you have a lot of dead wood, it is worth considering to be pruned out in winter.

NOVEMBER-DECEMBER

- **AFTER HARVEST:** A broadband fungicide spray (e.g. Mancozeb, Manzate etc. (1.5-4 lbs/ac)) should be used as preventative application before dormancy. This fungicide treatment will reduce overwintering inoculum of diseases such as Black Rot, Powdery Mildew, Bitter rot etc. **Warning: Please only use those products after your last harvest (66d PHI)**
- Take soil samples and send them to the NCDA & CS Agronomy laboratory in Raleigh, NC (http://www.ncagr.gov/agronomi/sthome.htm). Work with your local extension office to get the correct supplies and get informed how and where to take soil samples (https://www.ces.ncsu.edu/local-county-center/). Soil sample analytics at the NCDA & CS are free before Nov. 28 (Thanksgiving). Between Nov. 28 and Mar. 31, the NCDA & CS will charge a $4 fee per sample. Taking frequent samples is important to determine **your soil pH and possible lime applications.** Your soil pH should be between 6.0 and 6.5. If it is lower, you should follow the lime application recommendations made in the soil report**.** Dolomitic lime can be broadcasted in the vineyard, but it will take several months to affect the soil pH.
- Check all your pruning tools. Order replacement blades or new pruners and loppers in time. Pruning should be start in late December, early January. Invest money in high quality pruning tools, it is worth it.