Grapevine Maintenance: Summer Basics

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Today's topics

- Phenology
- New Mexico environment
- Water, irrigation
- Vine nutrition, fertilization
- Canopy management
- Disease, disorders and weeds
- Pests: vertebrates, invertebrates
- Harvest?





Phenology

COLLEGE OF AGRICULTURAL, CONSUMER AND ENVIRONMENTAL SCIENCES

Grapevine Phenology: Annual Growth and Development

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and selection; choice of cultivar and rootstock; timing of spraying, fertilization, vineyard floor, and canopy management; and harvest.

Grapevine phenology includes two distinct developmental cycles: vegetative and reproductive (flowering and fruiting). The vegetative cycle takes one growing season to complete. Conversely, the reproductive cycle requires two seasons, with flower inflorescences formed in year one, followed by flower initiation, bloom, and fruiting in year two (Figure 2). Oc, as simply described by Keller (2010), "Buds formed in the first year, give rise to shoots carrying fruit in the second year" (p. 68). In the first season, flower inflorescences form within the primary compound

In the first season, flower inflorescences form within the primary compound budy; these emerge in the second season as flower clusters, which are visible on the new shoots. These inflorescences give rise to flower clusters, which are visible on and set grape berries that are eventually harvested. For example, the number and size of flower clusters initiated in 2020 depends on the number of inflorescences formed within the dormant buds during the 2019 season (year one). However, the number of flowers that bloom in 2020, set berries, and achieve ripeness within each cluster is impacted by the environment during the 2020 season (year two).

Respectively, Extension Viticulture Specialist, Department of Extension Plant Sciences, New Massice State University (IMSU), Vasting Scientist (Statistical Analysis), NMSU; and Extension Endogy Ausociate (texting), University of Miscouri-Columbia.

REF: Guide H-338, aces.nmsu.edu/pubs



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E-L 1: Dormancy and winter bud





E-L 35: Veraison

E-L 27: Fruit set

New Mexico ...GDDs and frost-free days





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Albuquerque climate







30 Year Annual Normal Precipitation by Month for Albuquerque (ABQ) NM, Napa Valley, Bordeaux

ABQ - Annual: 9.45" Napa - Annual: 27.71" Month Bordeaux - Annual: 37.39"



Monthly Average Temperature Normals, January-December Albuquerque (ABQ) NM, Bordeaux, Napa Valley; d 1981-2010 for Albuquerque (ABQ) NM and Napa: 2000-2010 for Bordeau





Water and irrigation

The amount of water a grapevine needs depends on location, environment, its development stage and canopy size







Crop coefficient (kc)

- Used to adjust evapotranspiration calculations to more accurately reflect crop water use/loss (Moyer, 2017)
- The amount of water a grapevine needs varies according to its development stage





Hellman, 2015. http://agrilife.org/winegrapes/files/2015/11/irrigationscheduling.pdfdf



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Visual assessment of grapevine water status







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Visual assessment of grapevine water status



Note the difference in leaf blade angle... Does the presence of mulch have an impact?... Is the crop load and stage of development a factor?

Symptoms of grapevine water stress

- Shoot tips lose yellow or slightly reddish color and become gray green, tip growth slows
- Tendrils may dry and abscise
- Wilted leaves, especially during midday: leaf angle changes
- Leaf burn, loss of basal leaves
- Berries fail to "size up", may shrivel or "raisin"
- Vines ability to absorb nutrients is reduced



Water...how much?...when?

ET = 1.3 to 2.0 in/week and more in midsummer with full fruit load

- 10 to 30* gal/week /vine, * = about 3.5 inches /month /acre
- 150-450 gal/vine/season*
- Replacement of all (no deficit) or portion (deficit irrigation)
- Common practice: 2gal/vine/2 times/week = 0.18 inches of water/week for 1,200vines/acre



Shoot tip : petiole "growth gauge"



excessive: tendrils longer than tip



medium: tendrils almost equal to tip



Short or retracted: with leaves all the way to shoot tip and actually shutting down ...notice leaf angle orienting down and away from direct sunlight?



Vine nutrition, fertilization







Petiole Sampling

- *petiole* = leaf stem
- at full bloom...collect petioles located opposite flower cluster



- collect two samples, 'normal' and 'problem', compare results
- If no problems evident, skip for 1-2 years





REF: petiole sampling instruction sheet

GRAPE VERAISON PLANT TISSUE ANALYSIS

Test Description	Result	Units	Optimum Range	Graphical Results Presentation				
Macro Nutrients				Deficient	Low	Ample	High	Excessive
Nitrate-Nitrogen (Petiole)	6390	ppm	500 - 1200	il.			n onen M	97
Phosphorus (Petiole)	0.738	%	0.14 - 0.30					
Potassium (Petiole)	6.41	%	1.2 - 2.5	00			N)	20
Calcium (Petiole)	2.76	%	1.0 - 2.0	14				
Magnesium (Petiole)	0.613	%	0.25 - 0.75	491 				
Micro Nutrients							0	
Zinc (Petiole)	74.4	ppm	30 - 60	10				
Manganese (Petiole)	81.4	ppm	30 - 150					
Iron (Petiole)	30.4	ppm	30 - 100	40 40				
Copper (Petiole)	5.67	ppm	5.0 - 15	10				
Boron (Petiole)	39.1	ppm	25 - 50	4				
Sodium (Petiole)	0.395	%	< 0.15	42		2 2		



Problem



Mineral nutrients (REF: Keller, The Science Of Grapevines)

NUTRIENT	FUNCTION	DEFICIENCY SYMPTOM	NOTES
nitrogen	key nutrient, mobile in soil typically most abundant nutrient in vine	general yellowing, red petioles in some varieties	monitor, 3 lbs. N /ton of grapes
phosphorus	taken up similar rate as N	red leaves, reduce leaf # and small size	least available and non-mobile in soil
potassium	many roles in vine, it impacts stomates and growth in general	glossy, 'cupped' leaves susceptible to cold injury	
sulfur	Essential for several amino acids	yellow young leaves and stunted shoot growth	counteract stressors: high light, drought, cold, heat, fungi
iron	essential in chlorophyll	chlorosis, yellow to pink	symptoms common in labrusca
calcium	non-mobile in plant, needed for fruit set and cell walls	In young leaves, leaf and bunch stem necrosis	deficiency uncommon in NM
boron	pollen tube growth and germination	hens n chicks poor fruit set	DO NOT over apply
zinc	pollen formation	Poor fruit set (mimic boron def.) stunted, small leaves, wide petiolar sinus,	Low availability in high pH soils, high light intensity accelerate symptoms, toxicity rare

Canopy management?

• In New Mexico...use canopy management to avoid over-cropping and sunburn





How Many Peaches Does it Take To Fill A Box?

Effects of Crop load... Courtesy: Mr. Jim Kamas Texas A&M





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Disease and disorders...first manage with effective scouting





magnification







www.uspest.org



First time user? Select one or more Crops and enter a Zipcode to initialize defaults for your *MyPest Page* of plant disease risk and degree-day models. Then click the "Go" button.

Crop(s): apple	📃 pear	🗆 cherry 📄 peach 🗹 grape)
🖂 caneberries	⊟ strawberry	📄 hazelnut 📋 walnut 📄 pecan	
nursery	wheat	🗆 oats 🛛 📄 grains 📄 alfalfa	
🗆 beans	🗆 hop	vegetables potatoes corn	
🗆 sugarbeet	peppermint	🗆 sunflower 🖂 clover	
📃 invasive speci	es park&yard tre	es degree-day calc. only	
Zipcode: 24060 GO			

Online Phenology and Degree-day Models for agricultural and pest management decision making on the 95 wear





Herbicide drift?





Vertebrate challenges







A couple of common invertebrates

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STAT



When to Harvest?

What is your goal?

- Wine
- Juice
- Jelly
- Raisins





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Thank you! for your attention

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