

No “Wining”— Just Growing Grapes & Brambling Along Too...

Erik Draper, Commercial Horticulture Educator
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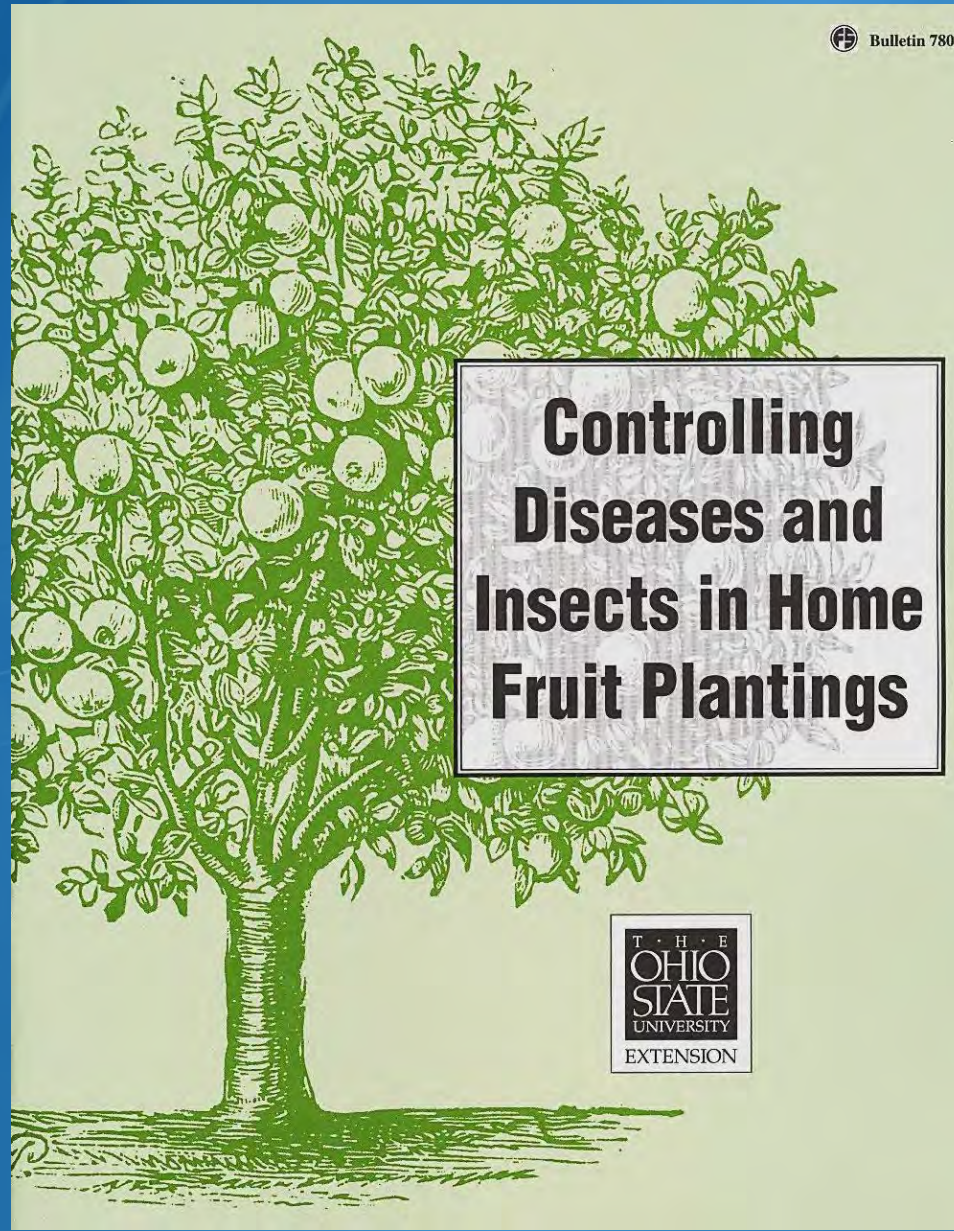
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We want to discuss...

- What grapes need to thrive
- Sorting out soil
- Types of Grapes
- Grape physiology & growth
- Get a sense of how to prune grapes
- Making the cuts
- Critical diseases of grapes



Really GREAT Resources...OSU Extension Bulletin-780



Commercial Guide also...

Midwest Fruit Pest Management Guide 2021-2022

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Midwest Fruit Pest Management Guide 2021-2022

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[Midwest Fruit Pest Management Guide .pdf](#)

The *Midwest Fruit Pest Management Guide* was developed by the Midwest Fruit Workers Group.

This publication combines two longtime guides that have become familiar to countless growers: the annual *Midwest Small Fruit and Grape Spray Guide* and the annual *Midwest Tree Fruit Spray Guide*.

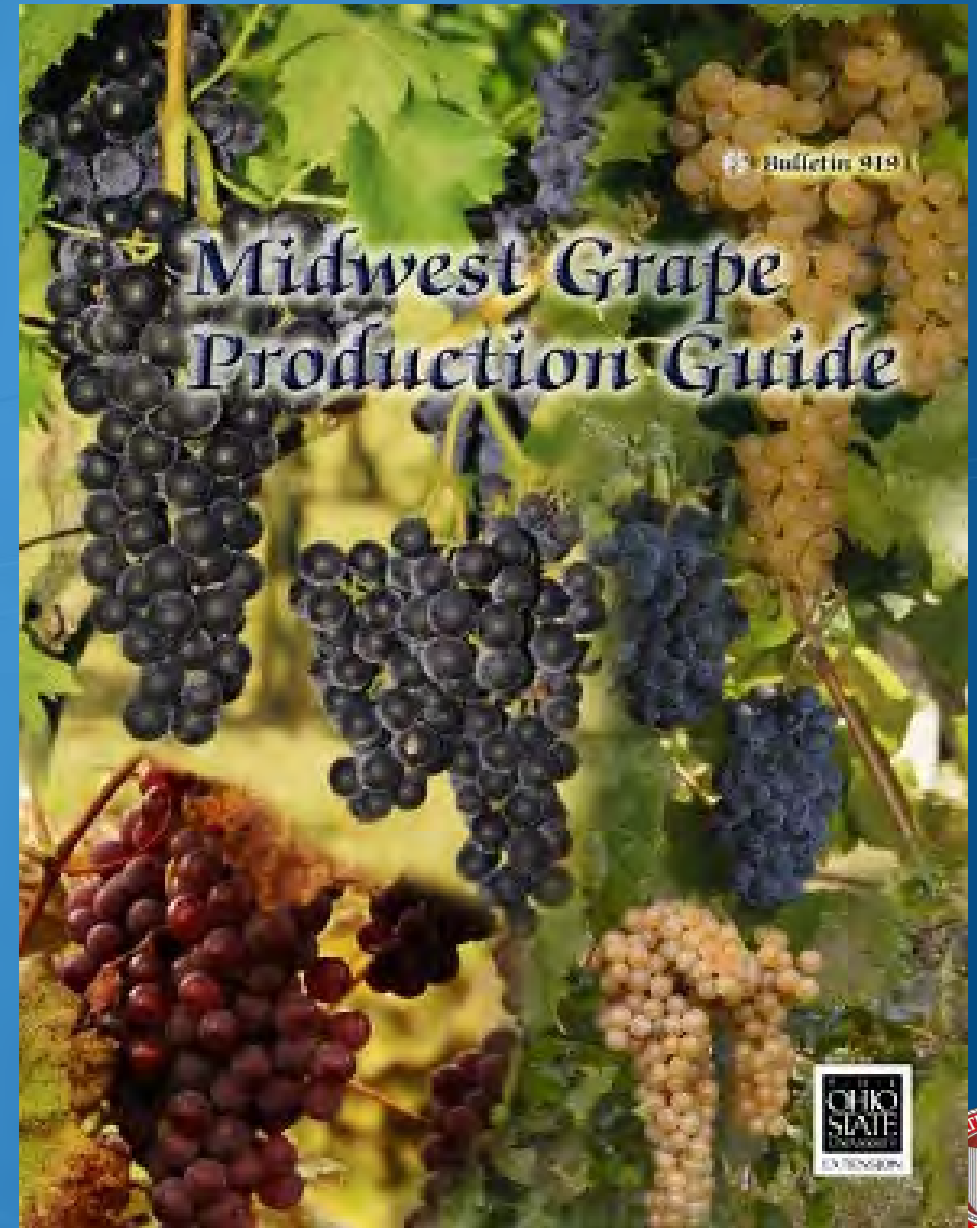
Print copies of the publication are available from the Purdue Extension Education Store. **Single copies** cost \$15 each, **boxes of 10** cost \$135 each.

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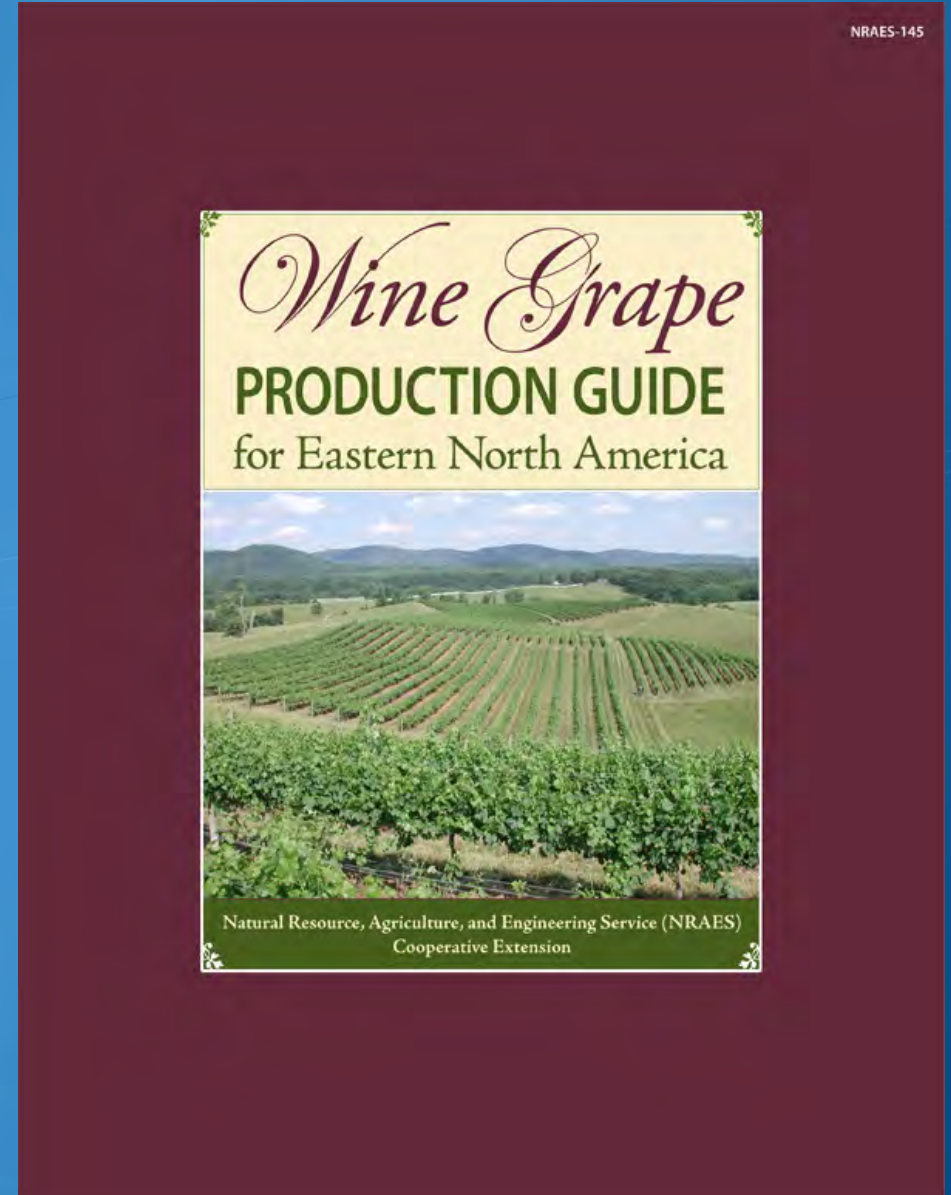
Really GREAT Resources...

- Ohio State University Extension
- Midwest Grape Production Guide- Collaborative effort
- Currently FREE & available https://plantpathology.ca.uky.edu/files/mw_grape_production_b919.pdf



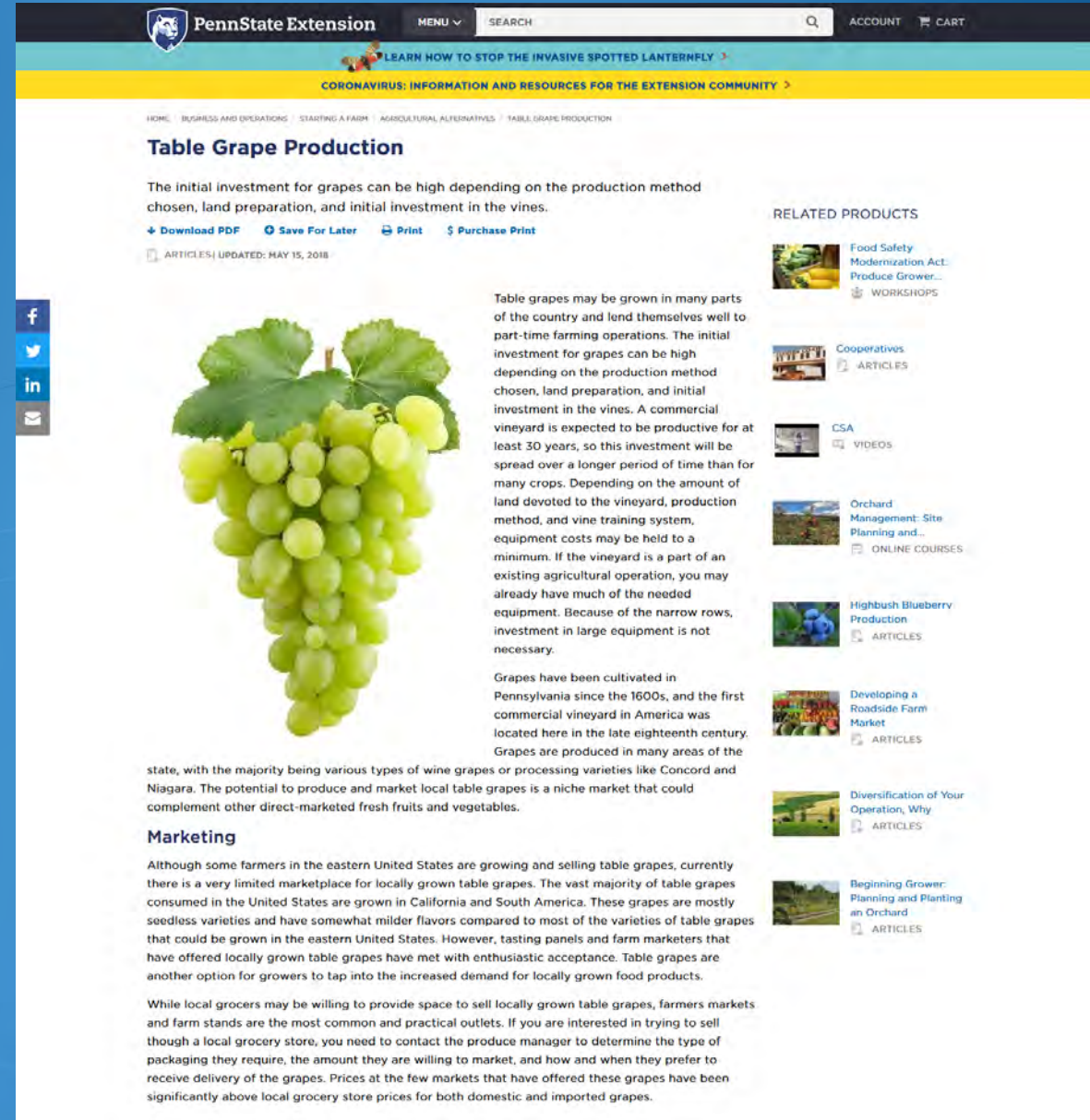
Really GREAT Resources...

- Natural Resource, Agriculture, and Engineering Service Cooperative Extension- NRAES-145
- Wine Grape Production Guide for Eastern North America
- Brief View online PDF
- Purchase for \$90- S&H \$6



Really GREAT Resources...

- Penn State Table Grape Production
- <https://extension.psu.edu/table-grape-production>



The screenshot shows the Penn State Extension website. The header includes the Penn State Extension logo, a menu, a search bar, and links for account and cart. A yellow banner at the top contains the text "CORONAVIRUS: INFORMATION AND RESOURCES FOR THE EXTENSION COMMUNITY". The main content area is titled "Table Grape Production" and includes a sub-header "The initial investment for grapes can be high depending on the production method chosen, land preparation, and initial investment in the vines." Below this are links for "Download PDF", "Save For Later", "Print", and "Purchase Print". A social media sidebar on the left shows icons for Facebook, Twitter, LinkedIn, and YouTube. The main text area features a large image of a bunch of green grapes. To the right of the image is a section titled "RELATED PRODUCTS" with links to "Food Safety Modernization Act: Produce Grower...", "Cooperatives", "CSA", "Orchard Management: Site Planning and...", "Highbush Blueberry Production", "Developing a Roadside Farm Market", "Diversification of Your Operation, Why", and "Beginning Grower: Planning and Planting an Orchard".

PennState Extension MENU SEARCH ACCOUNT CART

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HOME BUSINESS AND OPERATIONS STARTING A FARM AGRICULTURAL ALTERNATIVES TABLE GRAPE PRODUCTION

Table Grape Production

The initial investment for grapes can be high depending on the production method chosen, land preparation, and initial investment in the vines.

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ARTICLES | UPDATED: MAY 15, 2018




Table grapes may be grown in many parts of the country and lend themselves well to part-time farming operations. The initial investment for grapes can be high depending on the production method chosen, land preparation, and initial investment in the vines. A commercial vineyard is expected to be productive for at least 30 years, so this investment will be spread over a longer period of time than for many crops. Depending on the amount of land devoted to the vineyard, production method, and vine training system, equipment costs may be held to a minimum. If the vineyard is a part of an existing agricultural operation, you may already have much of the needed equipment. Because of the narrow rows, investment in large equipment is not necessary.

Grapes have been cultivated in Pennsylvania since the 1600s, and the first commercial vineyard in America was located here in the late eighteenth century. Grapes are produced in many areas of the state, with the majority being various types of wine grapes or processing varieties like Concord and Niagara. The potential to produce and market local table grapes is a niche market that could complement other direct-marketed fresh fruits and vegetables.

Marketing

Although some farmers in the eastern United States are growing and selling table grapes, currently there is a very limited marketplace for locally grown table grapes. The vast majority of table grapes consumed in the United States are grown in California and South America. These grapes are mostly seedless varieties and have somewhat milder flavors compared to most of the varieties of table grapes that could be grown in the eastern United States. However, tasting panels and farm marketers that have offered locally grown table grapes have met with enthusiastic acceptance. Table grapes are another option for growers to tap into the increased demand for locally grown food products.

While local grocers may be willing to provide space to sell locally grown table grapes, farmers markets and farm stands are the most common and practical outlets. If you are interested in trying to sell through a local grocery store, you need to contact the produce manager to determine the type of packaging they require, the amount they are willing to market, and how and when they prefer to receive delivery of the grapes. Prices at the few markets that have offered these grapes have been significantly above local grocery store prices for both domestic and imported grapes.

RELATED PRODUCTS

- [Food Safety Modernization Act: Produce Grower...](#) WORKSHOPS
- [Cooperatives](#) ARTICLES
- [CSA](#) VIDEOS
- [Orchard Management: Site Planning and...](#) ONLINE COURSES
- [Highbush Blueberry Production](#) ARTICLES
- [Developing a Roadside Farm Market](#) ARTICLES
- [Diversification of Your Operation, Why](#) ARTICLES
- [Beginning Grower: Planning and Planting an Orchard](#) ARTICLES

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Sample Budget Worksheets

- [Table Grape Alternative Production Retail Budget](#)
- [Table Grape Alternative Production Wholesale Budget](#)
- [Table Grape Conventional Production Retail Budget](#)
- [Table Grape Conventional Production Wholesale Budget](#)
- [Table Grape Establishment Budget](#)

For More Information

Barclay Poling, E., ed. [The North Carolina Wine Grape Grower's Guide](#). Raleigh: North Carolina State University, 2015.

Bordelon, B. P. "[Grape Varieties for Indiana](#)." Bulletin HO-221-W. Lafayette, Ind.: Purdue Extension, 2009.

Carroll, J., and T. Weigle. [Organic Production and IPM Guide for Grapes](#). Ithaca: New York State IPM Program, 2016.

Harper, J. K., S. Cornelisse, L. F. Kime, and J. Hyde. "[Agricultural Alternatives: Budgeting for Agricultural Decision Making](#)." University Park: Penn State Extension, 2013.

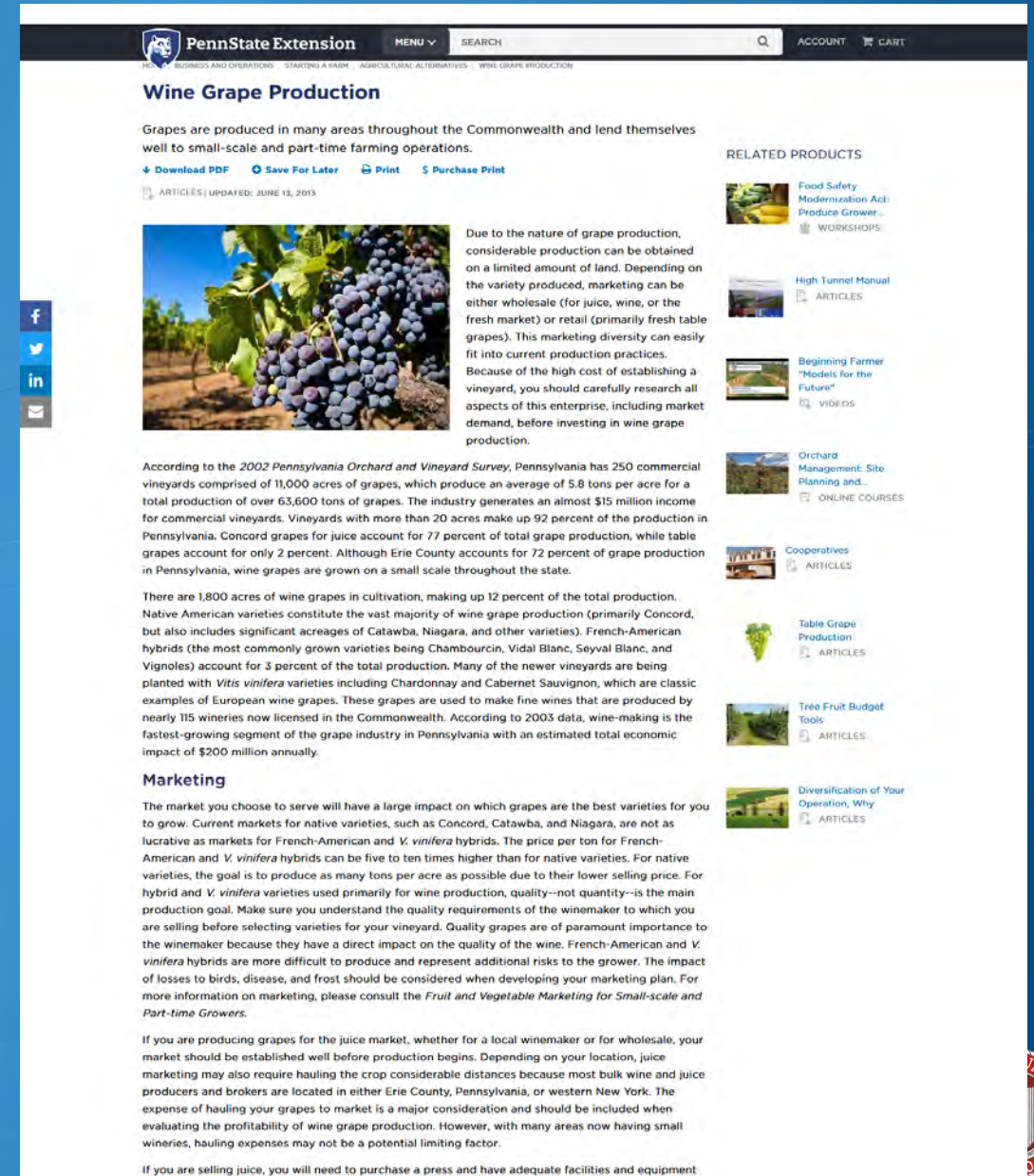
Isaacs, R. A. Schilder, T. Zabadal, and T. Weigle. [A Pocket Guide for IPM Scouting in the North Central and Eastern U.S.](#) Bulletin E-2889. East Lansing: Michigan State University Extension, 2011.

Kime, L. F., J. A. Adamik, E. E. Gantz, and J. K. Harper. "[Agricultural Alternatives: Agricultural Business Insurance](#)." University Park: Penn State Extension, 2004.



Really GREAT Resources...

- Penn State Wine Grape Production
- <https://extension.psu.edu/wine-grape-production>



The screenshot shows the Penn State Extension website page for "Wine Grape Production". The page header includes the Penn State Extension logo, a search bar, and links for "ACCOUNT" and "CART". Below the header, the page title "Wine Grape Production" is displayed. The main content area features a large image of a bunch of purple grapes. To the right of the image, there is a text block discussing the nature of grape production and marketing. Below the image, there is a paragraph of text providing statistics on grape production in Pennsylvania. Further down, there is a section titled "Marketing" with a detailed paragraph about market selection and production goals. On the right side of the page, there is a "RELATED PRODUCTS" section with several links to other resources, including "Food Safety Modernization Act: Produce Grower...", "High Tunnel Manual", "Beginning Farmer 'Models for the Future'", "Orchard Management: Site Planning and...", "Cooperatives", "Table Grape Production", "Tree Fruit Budget Tools", and "Diversification of Your Operation: Why".

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Wine Grape Production

Grapes are produced in many areas throughout the Commonwealth and lend themselves well to small-scale and part-time farming operations.

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ARTICLES | UPDATED: JUNE 13, 2013



Due to the nature of grape production, considerable production can be obtained on a limited amount of land. Depending on the variety produced, marketing can be either wholesale (for juice, wine, or the fresh market) or retail (primarily fresh table grapes). This marketing diversity can easily fit into current production practices. Because of the high cost of establishing a vineyard, you should carefully research all aspects of this enterprise, including market demand, before investing in wine grape production.

According to the 2002 Pennsylvania Orchard and Vineyard Survey, Pennsylvania has 250 commercial vineyards comprised of 11,000 acres of grapes, which produce an average of 5.8 tons per acre for a total production of over 63,600 tons of grapes. The industry generates an almost \$15 million income for commercial vineyards. Vineyards with more than 20 acres make up 92 percent of the production in Pennsylvania. Concord grapes for juice account for 77 percent of total grape production, while table grapes account for only 2 percent. Although Erie County accounts for 72 percent of grape production in Pennsylvania, wine grapes are grown on a small scale throughout the state.

There are 1,800 acres of wine grapes in cultivation, making up 12 percent of the total production. Native American varieties constitute the vast majority of wine grape production (primarily Concord, but also includes significant acreages of Catawba, Niagara, and other varieties). French-American hybrids (the most commonly grown varieties being Chambourcin, Vidal Blanc, Seyval Blanc, and Vignoles) account for 3 percent of the total production. Many of the newer vineyards are being planted with *Vitis vinifera* varieties including Chardonnay and Cabernet Sauvignon, which are classic examples of European wine grapes. These grapes are used to make fine wines that are produced by nearly 115 wineries now licensed in the Commonwealth. According to 2003 data, wine-making is the fastest-growing segment of the grape industry in Pennsylvania with an estimated total economic impact of \$200 million annually.

Marketing

The market you choose to serve will have a large impact on which grapes are the best varieties for you to grow. Current markets for native varieties, such as Concord, Catawba, and Niagara, are not as lucrative as markets for French-American and *V. vinifera* hybrids. The price per ton for French-American and *V. vinifera* hybrids can be five to ten times higher than for native varieties. For native varieties, the goal is to produce as many tons per acre as possible due to their lower selling price. For hybrid and *V. vinifera* varieties used primarily for wine production, quality—not quantity—is the main production goal. Make sure you understand the quality requirements of the winemaker to which you are selling before selecting varieties for your vineyard. Quality grapes are of paramount importance to the winemaker because they have a direct impact on the quality of the wine. French-American and *V. vinifera* hybrids are more difficult to produce and represent additional risks to the grower. The impact of losses to birds, disease, and frost should be considered when developing your marketing plan. For more information on marketing, please consult the *Fruit and Vegetable Marketing for Small-scale and Part-time Growers*.

If you are producing grapes for the juice market, whether for a local winemaker or for wholesale, your market should be established well before production begins. Depending on your location, juice marketing may also require hauling the crop considerable distances because most bulk wine and juice producers and brokers are located in either Erie County, Pennsylvania, or western New York. The expense of hauling your grapes to market is a major consideration and should be included when evaluating the profitability of wine grape production. However, with many areas now having small wineries, hauling expenses may not be a potential limiting factor.

If you are selling juice, you will need to purchase a press and have adequate facilities and equipment

RELATED PRODUCTS

- Food Safety Modernization Act: Produce Grower...
WORKSHOPS
- High Tunnel Manual
ARTICLES
- Beginning Farmer "Models for the Future"
VIDEOS
- Orchard Management: Site Planning and...
ONLINE COURSES
- Cooperatives
ARTICLES
- Table Grape Production
ARTICLES
- Tree Fruit Budget Tools
ARTICLES
- Diversification of Your Operation: Why
ARTICLES

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Sample Budget Worksheets

- [Sample Wine Grape Budget - Land Prep through Year 3](#)
- [Sample Wine Grape Budget - Mature Production](#)

Initial Resource Requirements

Land: 1 acre

Labor--full production: 100-120 hours

Harvest labor: \$660.00

Capital investment: \$14,425.00

Equipment needed:

- Tractor (40-50 horsepower)
- Airblast sprayer (50-200 gal)
- Herbicide sprayer (50-200 gal)
- Tools for trellis construction
- Hand shears for harvest
- First-aid supplies and bee sting kit
- Harvest containers

For More Information



Hierarchal Scale of Plant Resource Allocation

- 1°- SURVIVE: Plant life processes consume all photosynthates
- 2°- New twig extension or growth
- 3°- Flower initiation & production
- 4°- Fruit production & ripening



Fruit Bearing Wood...

- 1st year wood- any **mature** wood or growth of twig/cane/branch extension, produced the previous season (one year old wood)
- 2nd year wood- any **mature** wood or growth of twig/cane/branch extension, produced two full seasons preceding bloom (two-year old wood)



What GRAPES want...

- Types
 - Dessert/Table
 - Wine
- Lifespan
 - 60-100 years
- Propagation- tip layering & grafting
- Soil pH 5.5-7 (6-6.5)
- Self-fruitful
- Raised bed (4 inches)
- Hillside- air drainage
- Pruning systems
 - 4-arm Kniffin
 - Cordon
 - Geneva Double Curtain
- No fertilizer until < 6 ft. of new cane growth
- Fruit on 1st year wood



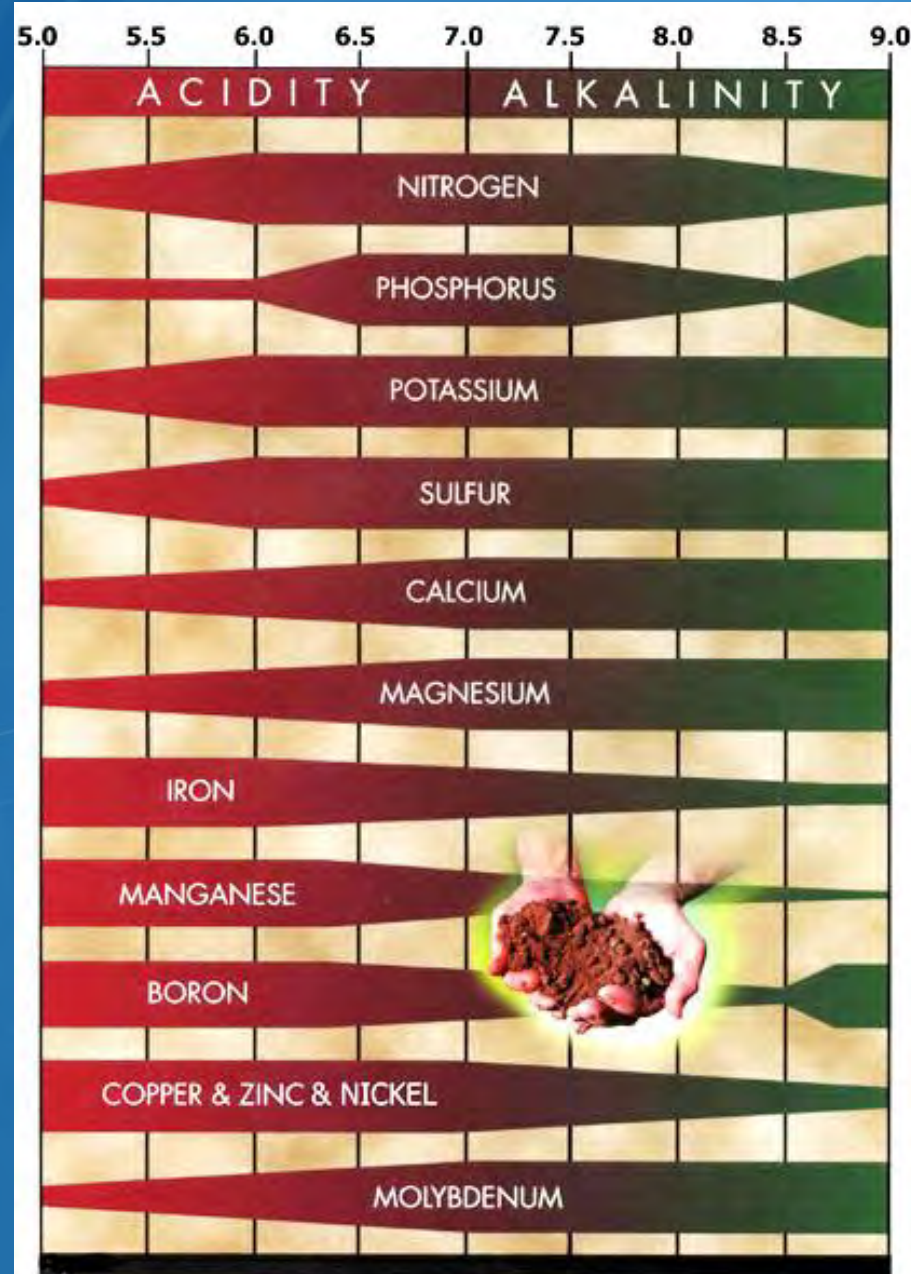


Don't Guess... Soil Test!

- Soil pH
- Nutrient deficiencies
- Nutrient excesses
- Potential nutrient holding capacity of the soil
- Recommendations to modify potential soil nutritional issues



pH affects nutrient availability...



Nutrient Goals for soils with fruits...

Soil Test Results: Ideal Values

pH	Phosphorus P lbs. / A*	Potassium K lbs. / A*	Calcium Ca lbs. / A*	Magnesium Mg lbs. / A*	Cationic Exchange Capacity C.E.C. meq./100 gms	Base Saturation		
						% Ca	% Mg	% K
5.5 to 6.5	50 to 100	250 to 400	800 plus	150 to 250	7 to 10 or higher	40 % to 80%	10% to 40%	3% to 5%

* To convert ppm (parts per million) to lbs/A (pounds per acre) multiply by 2.
Example: 50 ppm X 2= 100 lbs/A (Hint: 2 P's in PPM)



Origin of Grapes in United States...

- Well adapted American native species
- Late 18th century...
- Spanish missionaries likely brought European varieties
- When moved north from Mexico...
- Established vineyards in California
- California produces majority of European grape varieties in US



Grape..ling with grape terms...

- Table grapes
- All derived from European species- *Vitis vinifera*...
- Characterized by-
 - Very thin skinned
 - Skin closely adheres to berry flesh
 - Seeds if present- slip out of flesh easily
 - Some varieties seedless
- Seedless grapes easier to eat but are less flavorful than seeded table grape varieties!
- Also commonly called “Dessert” grapes



Seedless Table Grape Cultivars for Ohio						
Cultivar	Color	Average Cluster Wt. (lbs)	Winter Hardiness*	Days from Bloom to Harvest**	Ripening Date	Remarks
Canadice	Red	0.28	Moderately Hardy	75	Very Early	Productive; good clusters.
Einset	Red	0.20	Hardy	75	Very Early	Slip skin; mild strawberry flavor; may shatter.
Himrod	White	0.22	Moderately Hardy	75	Very Early	High quality; straggly clusters.
Marquis	White	0.50	Hardy	105	Midseason	Highly productive; high quality; loose clusters; resists cracking; susceptible to downy mildew in wet years.
Mars	Blue	0.29	Hardy	80	Early	High productivity; medium clusters; disease resistant.
Reliance	Red	0.33	Hardy	90	Early Midseason	High quality; productive; uneven color; susceptible to berry cracking.
Vanessa	Red	0.24	Hardy	105	Midseason	Adherent skin; compact clusters; firm, crisp flesh; requires girdling for berry sizing.
Lakemont	White	0.50	Moderately Hardy	80	Early	Adherent skin; firm flesh.
Jupiter	Blue	0.29	Moderately Hardy	85	Early	Muscat flavor; oval berries; large, 4.3 g; very susceptible to downy mildew.
Neptune	White	0.53	Moderately Hardy	97	Midseason	Compact clusters; low vigor; adherent and thick skin; oval berry, 3.2 g.
Suffolk Red	Red	0.24	Moderately Hardy	90	Midseason	Loose clusters; good flavor.
* Winter hardiness rating: tender, 0°F to -10°F; slightly hardy, -5°F to -15°F; moderately hardy, -10°F to -20°F; hardy, -15°F to -25°F; and very hardy, -20°F to -35°F.						
** Bloom occurs four to six weeks after bud break. Tablegrapes can be grown in all regions in Ohio.						

Table vs Wine berries...



Wine Grapes vs. Table Grapes

Grape..ling with grape terms...

- Wine grapes
- *Vitis vinifera*- European origin
- Typically, European species less cold tolerant
- *Vitis labrusca* & *V. rotundifolia*- American origin
- French- American hybrids
 - Hybrid crosses of wild American grape (primarily *V. rupestris*, *V. lincecumii*, & *V. riparia*) & European (*V. vinifera*)
 - Called French-American hybrids because most of the breeding work was done in France



Clarify cluster of grape species...

- *Vitis labrusca* also called “fox grape”
- Characteristic “foxy musk” best identified in flavors
- “Musk” not mammalian fox- rather unique, earthy & sweet muskiness perceived in fresh Concord grapes
- *Vitis rotundifolia* also called “muscadine”
 - First cultivated wine grape in this country...
- Familiar American varieties- Concord & Catawba



Clarify cluster of grape species...

- American grape varieties ripen in fall
- Therefore, fresh only available September & October
- American varieties also called “slip-skin” grapes
- Skins (thick) separate readily from the flesh
- Although seeds are tightly embedded into flesh



Pay attention to U of Minn program...

- New winter hardy, disease-resistant selections based on Minnesota's native grape
 - *Vitis riparia*
- U of Minn has developed five cold wine grape varieties: Frontenac (red/rose/port), Frontenac gris (white), Frontenac blanc (white), La Crescent (white), and Marquette (red)
- U of Minn released in 2017 newest cold-hardy grape, Itasca, after a 20-year breeding program



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Which grape is which...




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CFAES

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Pruning Backyard Grapevines in the First Three Years

Maurus Brown, Ph.D., Associate Professor Emeritus, OSU South Centers
Gary Gao, Ph.D., Associate Professor and Small-Fruit Extension Specialist, OSU South Centers; and
Adjunct Associate Professor, Department of Horticulture and Crop Science, The Ohio State University

Grape gardeners often become confused as to what should be pruned off and when. Proper pruning will help maintain a grapevine's potential of producing a good quality fruit crop, develop good vine structure, increase sunlight exposure into the canopy, promote the development of next year's fruiting wood, and potentially reduce disease and insect pressure. The key to good pruning is learning how to select good quality fruiting wood to leave for cropping.





As green shoots mature in the late summer and fall, they will begin to harden-off by developing a periderm (bark layer) that is reddish-brown in color. Healthy shoots will harden-off the full length of the shoot. Any green growth (generally at the tip) remaining at frost will be killed.

Proper pruning can help to reduce the amount of unproductive wood and balance the level of fruit crop with the overall vegetative growth each year. Once pruning is completed, the remaining fruiting wood should be spread out over the entire allotted space for the vine on the trellis.

How do I prune my grapevines after the first year of growth?

In the first growing season, remove all fruit and unwanted lateral shoots from the young vines throughout the growing season. Grapevines tend to grow rapidly from the apical end (main growing point) when lateral shoots and fruit are removed. Vines should be staked and tied (using twine or string) to allow the new shoot to form a straight trunk (Figure 1). The leaves should remain on the developing trunk to produce necessary carbohydrates to feed the plant; all lateral shoots, however, should be removed. Only lateral shoots at the top wire will be left. New growth may reach the top wire (around 5 to 5½ feet) during the first year. If this occurs, pinch off the end

Search



HYG-1429

Agriculture and Natural Resources
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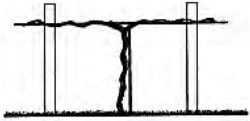
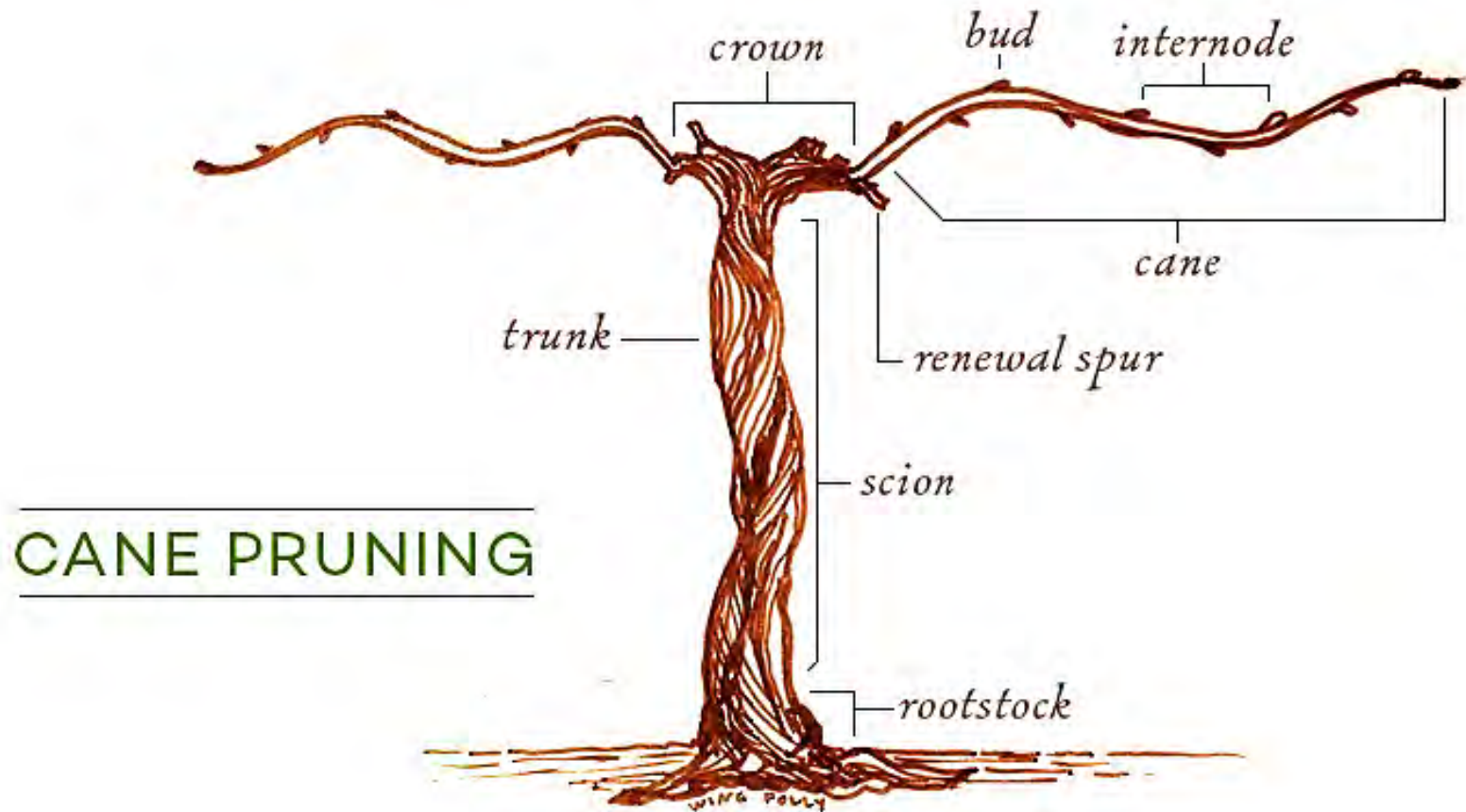


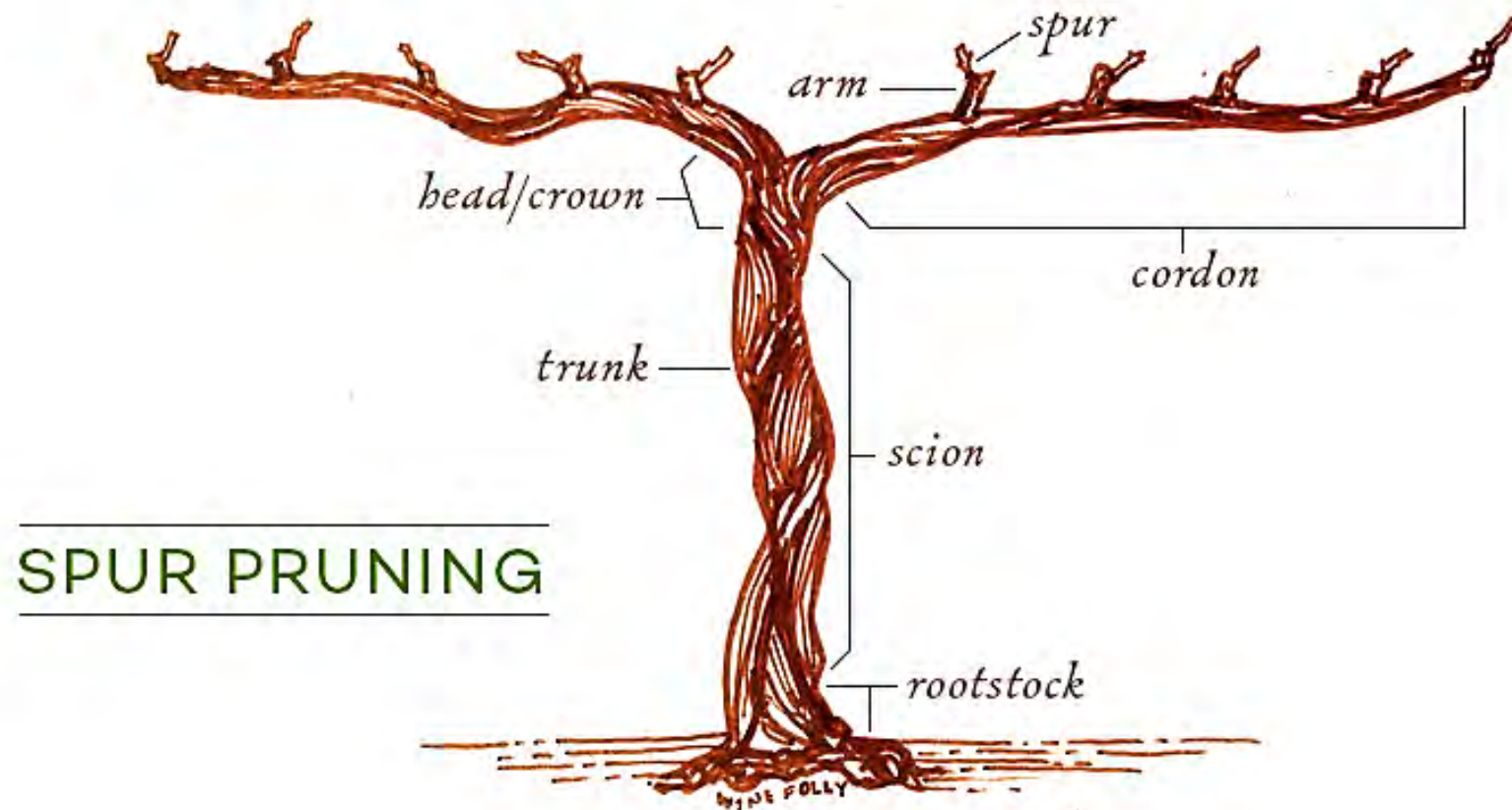
Figure 1. Grapes should be trained to an appropriate position on the trellis or arbor.



Common Grape Training bases...



Cordon or Spur...



Wine grape trellis/training systems...

COMMON VINE TRAINING METHODS



single cordon



double cordon



single guyot



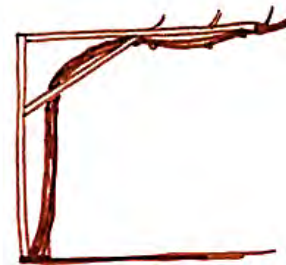
double guyot



geneva double curtain



scott henry



pergola



lyre

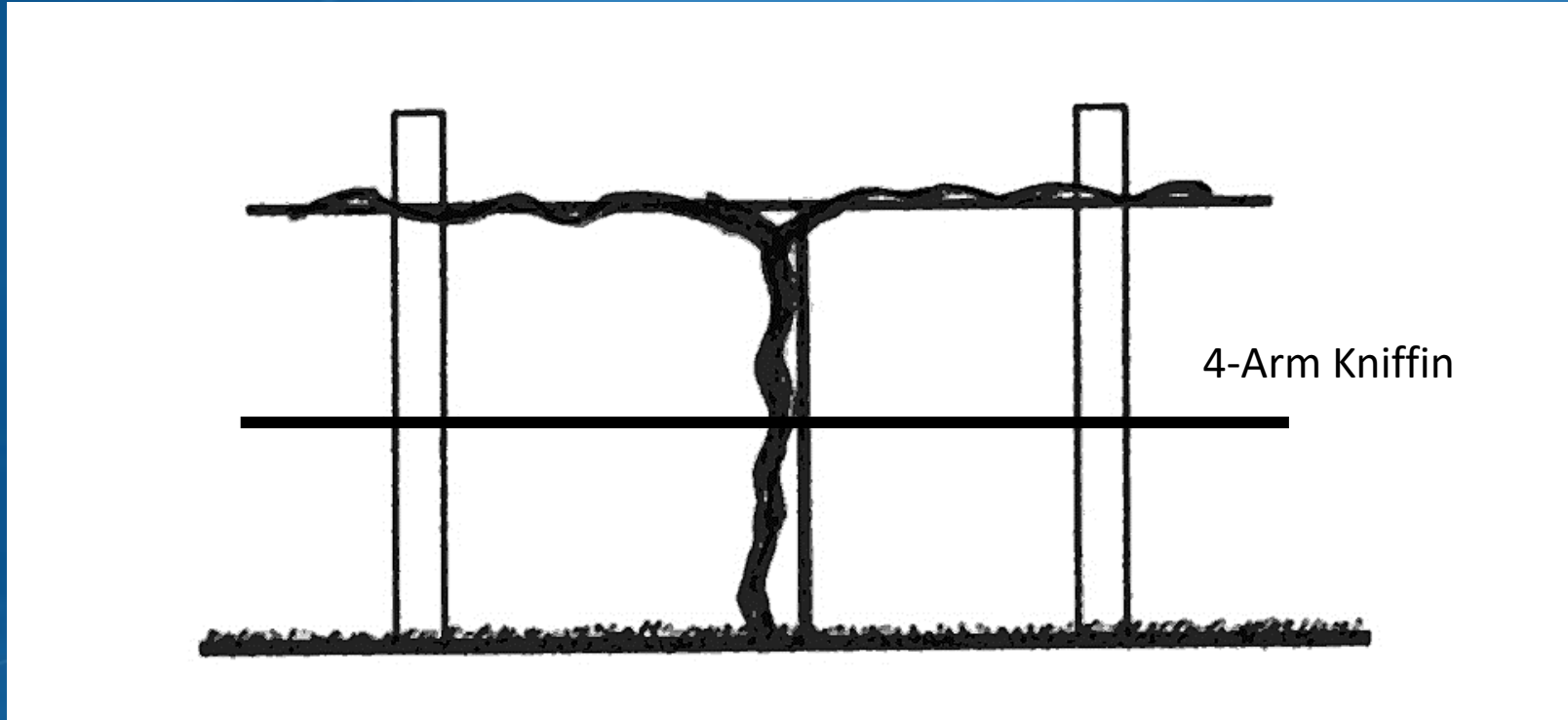


goblet / head



basket / kouloura

1st year vine- cordon training system...



Grapes should be trained to an appropriate position on the trellis or arbor

Great Grapes = Proper Pruning



Great Grapes = Proper Pruning



Great Grapes = Proper Pruning



Great Grapes = Proper Pruning



Great Grapes = Proper Pruning



Great Grapes = Proper Pruning



Dastardly Diseases of Grapes

- Black Rot- *Guignardia bidwellii*
- Downy Mildew- *Plasmopara viticola*
- Powdery Mildew- *Uncinula necator*



Black Rot of Grape- *Guignardi bidwellii*



Black Rot of Grape



Plasmopara viticola- Downy Mildew



Downy Mildew from APS.net



Powdery Mildew- *Uncinula necator*



When left unmanaged...



Just Bramblin' Along...

Erik Draper, Commercial Horticulture Educator
Ohio State University Extension, Geauga County

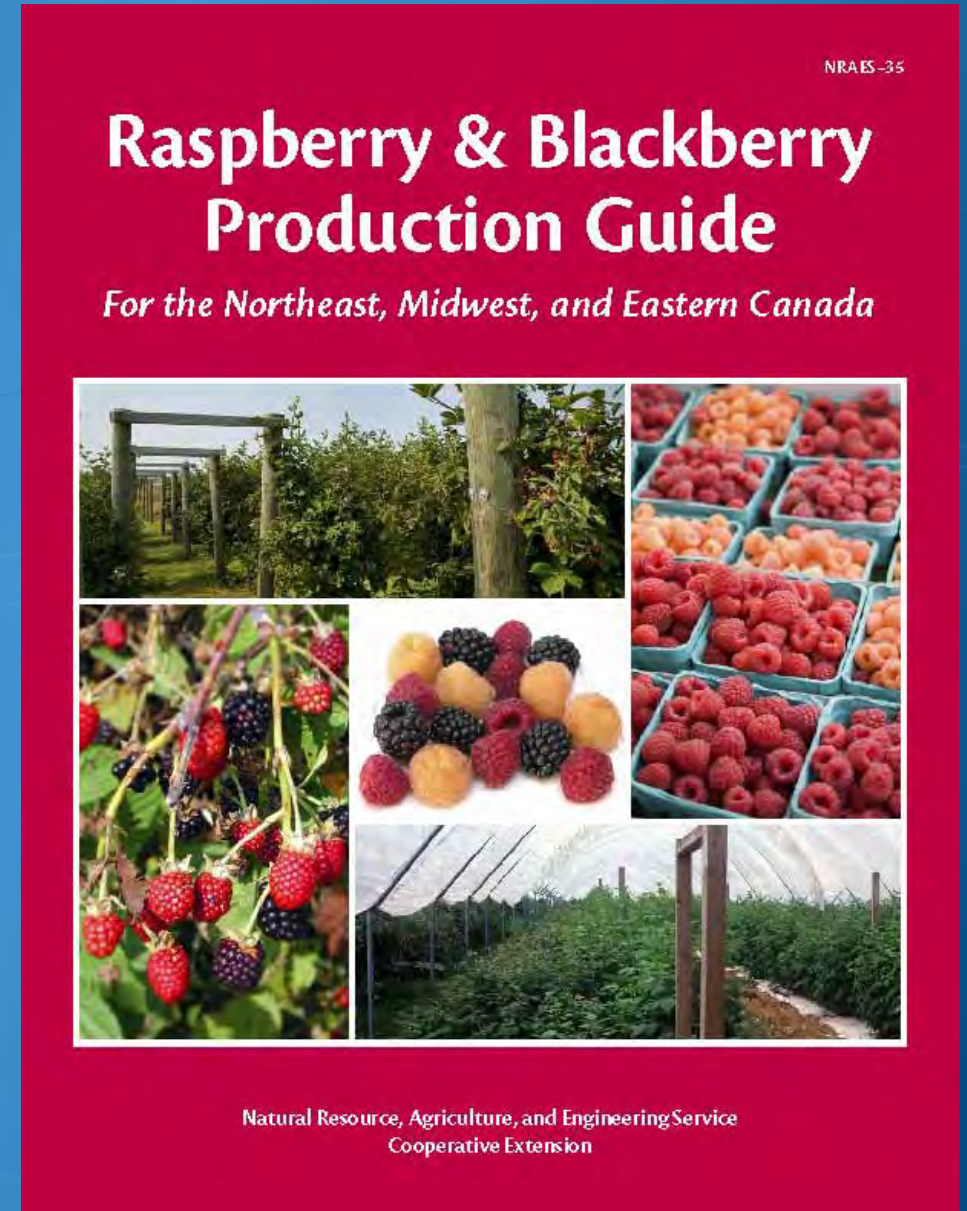


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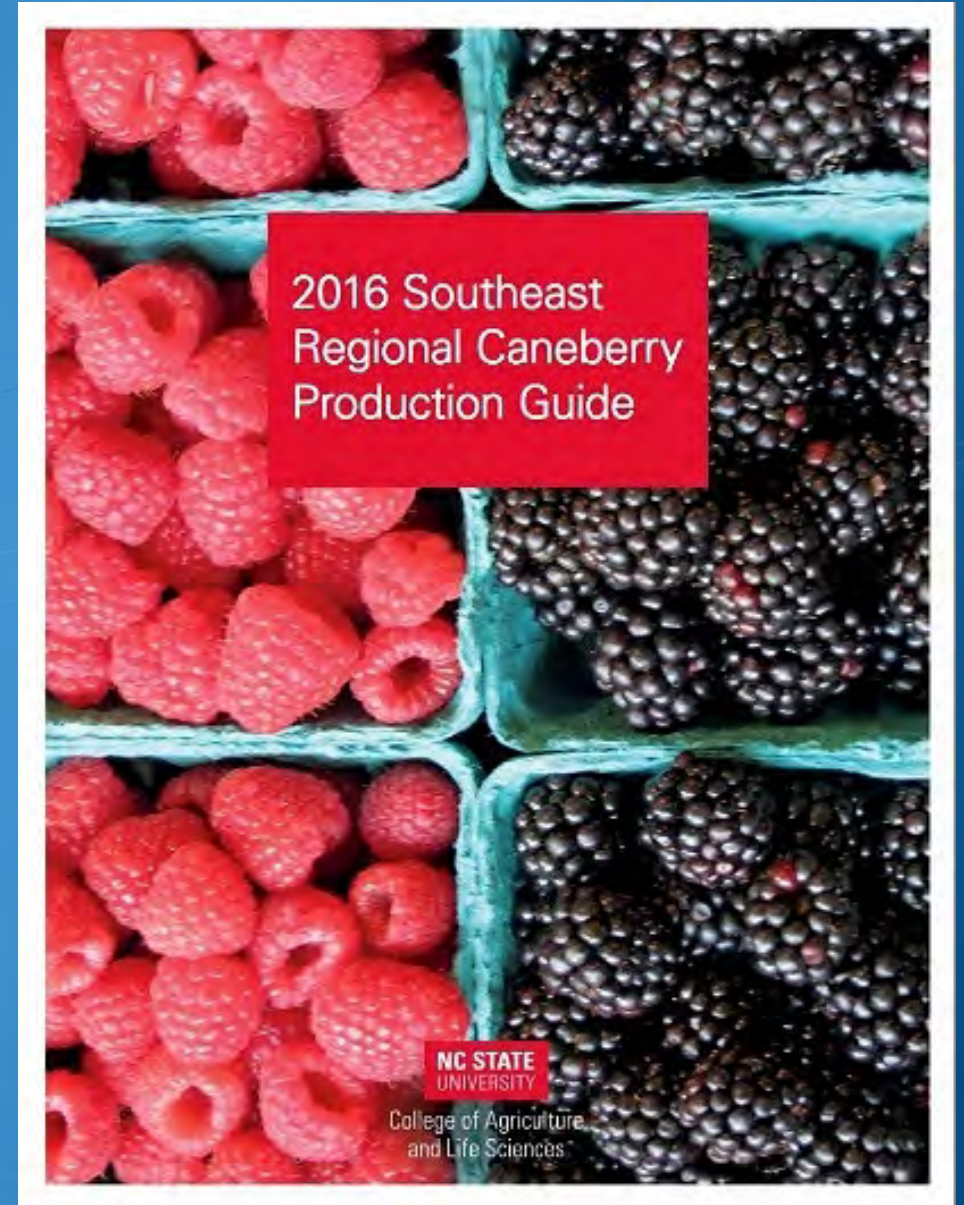
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- <https://www.canr.msu.edu/foodsystems/uploads/files/Raspberry-and-Blackberry-Production-Guide.pdf>
- View online free via PDF
- Purchase for \$37- S&H \$6



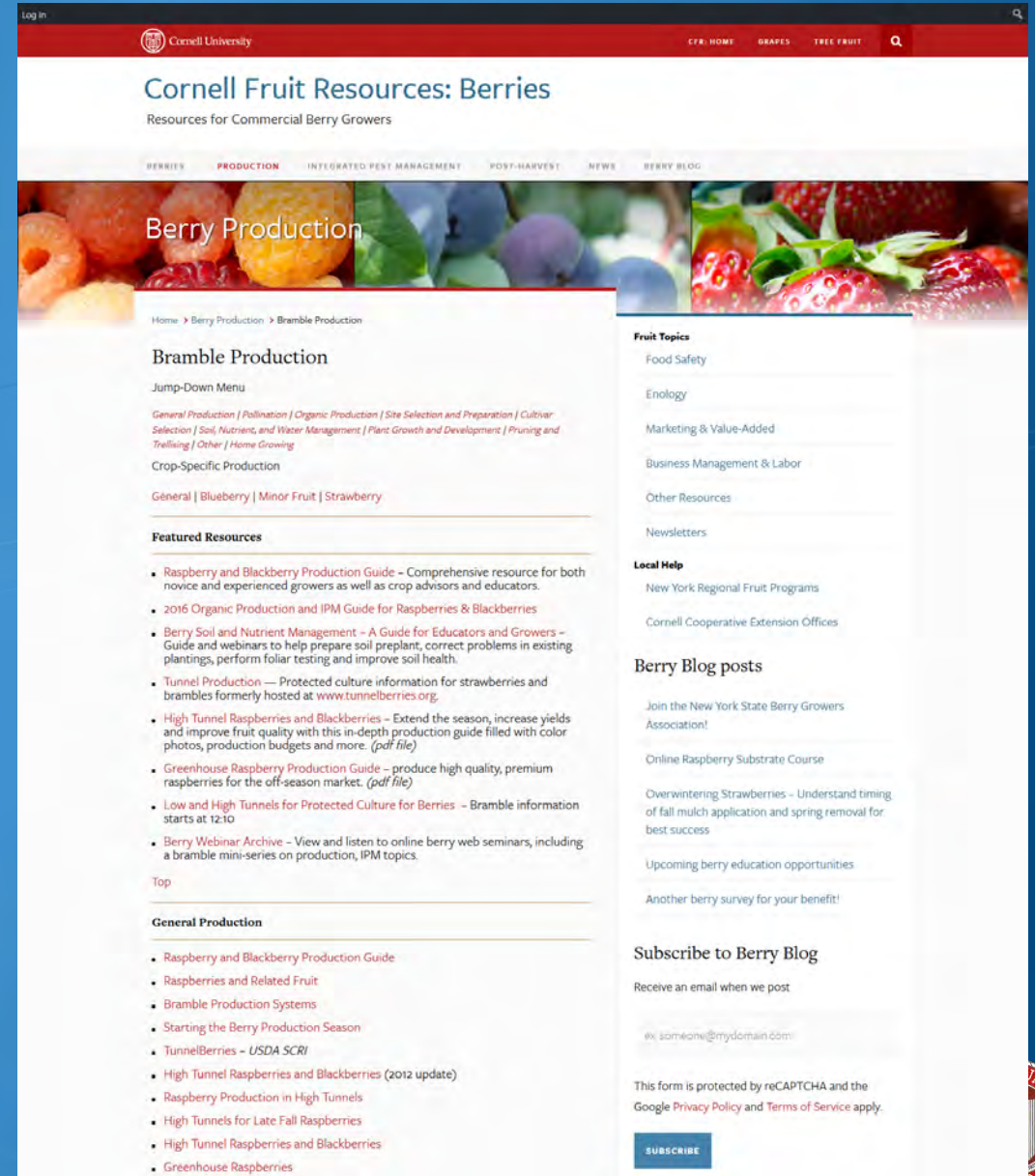
Really GREAT Resources...

- FREE as printable PDF
- <https://content.ces.ncsu.edu/southeast-regional-caneberry-production-guide>



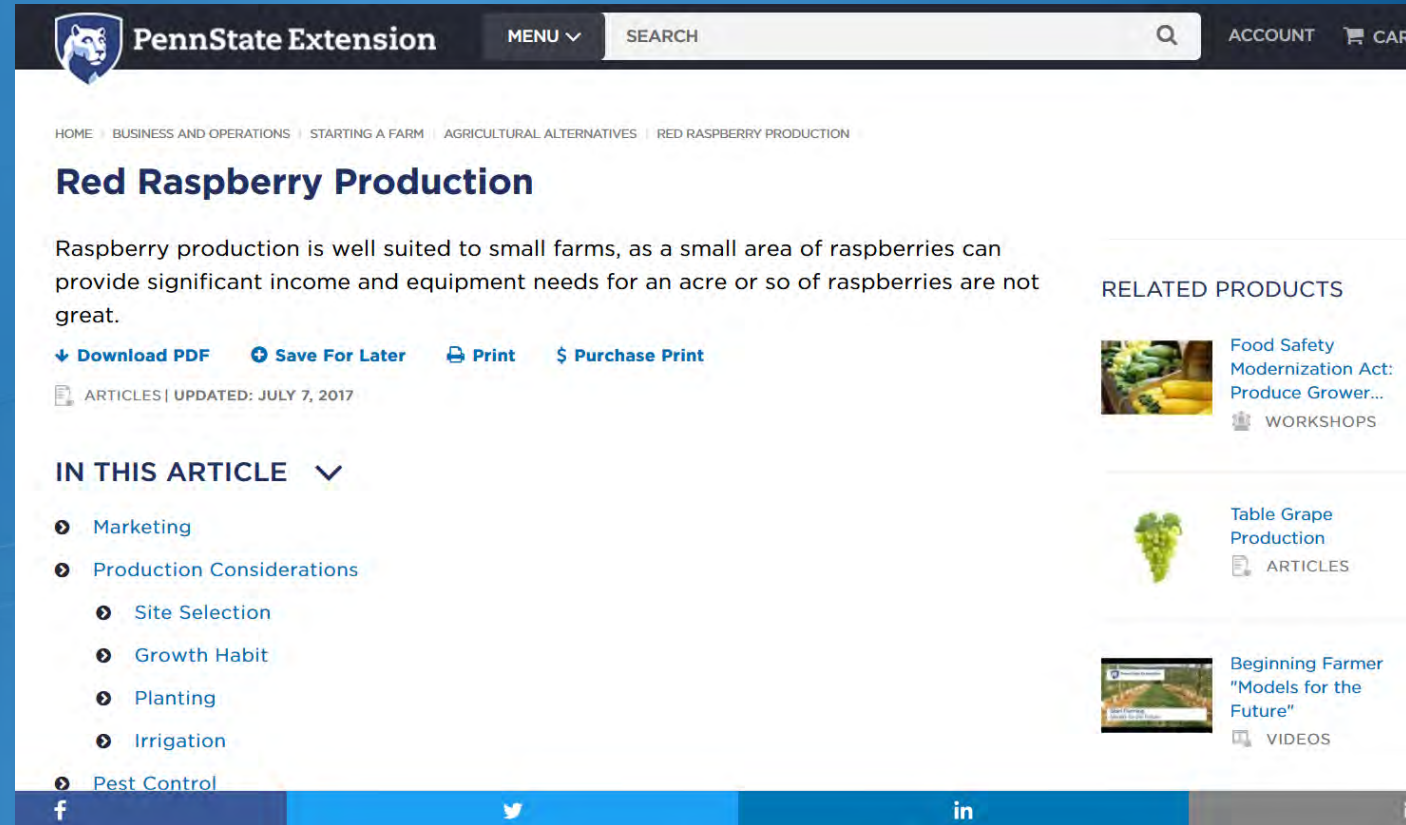
Really GREAT Resources

- Cornell Bramble Production
- <https://blogs.cornell.edu/berries/productions/raspberry-and-blackberry-production/>



Really GREAT Resources

- Penn State Red Raspberry Production
- <https://extension.psu.edu/red-raspberry-production>



The screenshot displays the Penn State Extension website interface. At the top, the header includes the Penn State Extension logo, a navigation menu, a search bar, and links for 'ACCOUNT' and 'CART'. Below the header, a breadcrumb trail reads: HOME > BUSINESS AND OPERATIONS > STARTING A FARM > AGRICULTURAL ALTERNATIVES > RED RASPBERRY PRODUCTION. The main heading is 'Red Raspberry Production'. The introductory text states: 'Raspberry production is well suited to small farms, as a small area of raspberries can provide significant income and equipment needs for an acre or so of raspberries are not great.' Below this text are four action buttons: 'Download PDF', 'Save For Later', 'Print', and 'Purchase Print'. A note indicates 'ARTICLES | UPDATED: JULY 7, 2017'. The 'IN THIS ARTICLE' section lists five topics with expandable icons: Marketing, Production Considerations (which is expanded to show 'Site Selection', 'Growth Habit', 'Planting', and 'Irrigation'), and Pest Control. On the right side, the 'RELATED PRODUCTS' section features three items: 'Food Safety Modernization Act: Produce Grower...' with a 'WORKSHOPS' icon, 'Table Grape Production' with an 'ARTICLES' icon, and 'Beginning Farmer "Models for the Future"' with a 'VIDEOS' icon. The footer contains social media icons for Facebook, Twitter, and LinkedIn.



Scroll down through to find...




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SEARCH



ACCOUNT

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SAMPLE BUDGET WORKSHEETS

- [Sample Red Raspberry Budget - Land Preparation Budget](#)
- [Sample Red Raspberry Budget - Planting Budget](#)
- [Sample Red Raspberry Budget - Second Year of Production Budget](#)
- [Sample Red Raspberry Budget - Retail Marketing Production Budget](#)
- [Sample Red Raspberry Budget - Pick-Your-Own Production Budget](#)

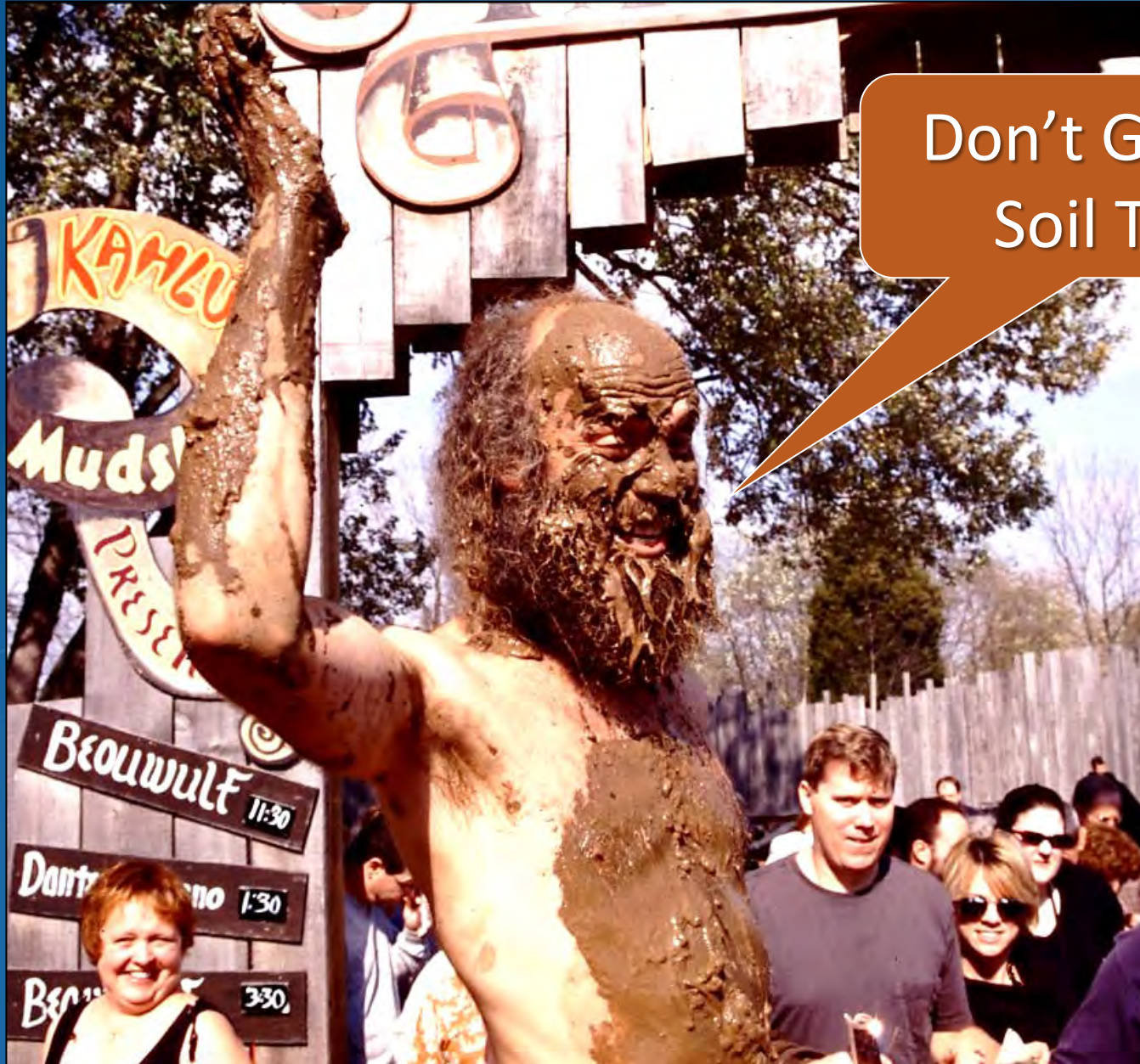
Initial Resource Requirements

- Land: 1 acre
- Labor:
 - Land preparation: 3 hours
 - Establishment: 60-70 hours
 - Production (year 1): 20-30 hours
 - Production (mature): 45-55 hours
 - Custom harvest labor (mature): \$7,000-\$7,500
- Capital:
 - Land preparation: \$200-\$400
 - Red raspberry plants: \$1,800-\$2,000
 - Trellis: \$3,500-\$4,000
 - Trickle irrigation: \$800

For More Information



Soil Man Knows THE SECRET...



Don't Guess...
Soil Test!

Yearly bramble Nitrogen guide...

Table 1: Estimates of Nitrogen Requirements for Bramble Crops.

Adapted from Bushway et al. (2008) and Fernandez et al. (2016).

Bramble Type	Growth Stage	Pounds per Acre of Nitrogen
Blackberries*	Establishment Year	25 to 50
	Second Year	50 to 80
	Third and Subsequent Years	60 to 80
Summer-bearing Raspberries	Establishment Year	25 to 55
	Second Year	40 to 80
	Third and Subsequent Years	40 to 80
Primocane-fruited Raspberries	Establishment Year	25
	Second Year	50 to 80
	Third and Subsequent Years	70 to 100

* Primocane-fruited blackberries may require higher N fertilization rates, but currently no specific recommendations exist. Monitor foliar nutrient levels and adjust fertilization strategy as needed.

Note that N fertilizer rates should fall on the high end of the range for sandy soils with low organic-matter content and fall on the low end of the range for heavy soils and/or soils with high organic-matter content.



Pre-plant brambles soil nutrients guide...

Table 2: Desired Soil-nutrient Content (pounds per acre) at Pre-plant

(Source: 2016 Southeast Regional Caneberry Production Guide, based on University of Arkansas recommendations)

Nutrient	Soil Nutrient Content (pounds per acre)
Phosphorus	40-60
Potassium	200-400*
Calcium	1000-2000**
Magnesium	100-250
Sulfur	21-40
Iron	101-200
Manganese	51-200
Zinc	1.1-3
Copper	1.1-3
Boron	1.0-2.0

* Recommendations from Oregon State for potassium are higher (300 to 600 pounds per acre). Because this mineral is not mobile in the soil, growers might want to use the higher rates, but take care not to cause salt injury to new plantings.

** Optimum calcium levels depend on soil type. Liming the soil usually supplies enough calcium.



BRAMBLES or CANEBERRIES

- Red raspberries
- Yellow raspberries
- Purple raspberries
 - red x black rasp hybrid
- Black raspberries- a.k.a. “black caps”
- Blackberries
 - Thornless
 - Thorned
 - Trailing- low growing
 - “dewberries”
 - Semi-erect
 - Erect
- Red raspberry X Blackberry hybrids
 - Tayberry
 - Loganberry
 - Boysenberry
 - Marionberry
 - Silvanberry (euro)
 - Tummelberry (euro)
- Red raspberry X Blackberry X dewberry hybrids
 - Youngberry



What BRAMBLES want...

- Types
 - Standard/Summer
 - “Everbearing” really...
 - Fall bearing
- Lifespan
 - site 2-15 years
- pH 5.5-7.5 (5.7-6)
- Shallow fibrous root system-
70% uptake < top 10” of soil
- Self-fruitful...but larger & better
fruit w/bees
- Propagation- tip layering or
basal buds @ crown
- Irrigation critical- soaker/ooze
- Encroach vs clump
- Encroachers- new buds on
roots = suckers
 - Reds
 - Yellows
 - Thorned blackberries
- Clumpers- new buds on crown
 - Black raspberry
 - Purple raspberry
 - Thornless blackberry
- Cold Hardiness
 - Thorned Blacks tolerate -20 to -
30F
 - Thornless tolerate -5 to -10F



Perennial, Biennial Plants...

- Perennial roots
- Biennial shoots
 - 1st year- new canes are “primocanes”
 - 2nd year- same canes are “floricanes”
- So what exactly is a “fruiting primocane” or everbearing bramble?
- Everbearing really late summer/early fall bearing




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Raspberries for the Home Fruit Planting

Gary Gao, Ph.D., Associate Professor and Small-Fruit Extension Specialist, OSU South Centers and Adjunct Associate Professor, Department of Horticulture and Crop Science, The Ohio State University
Erik Draper, Assistant Professor and County Extension Educator, OSU Extension, Geauga County
Rory Lewandowski, County Extension Educator, OSU Extension, Wayne County

Raspberries can be used in a variety of appealing and delicious ways. Freshly prepared and sugared raspberries are excellent when either served alone (Figure 1) or used to make a raspberry sundae. The fruit can also be used to make delicious jams, jellies, pies and other desserts. Besides their excellent flavor, raspberries are a nutritious food, contributing vitamins A and C and various minerals to the diet. Making a raspberry smoothie is a delicious treat and a nutritious way to enjoy this wonderful group of berries. Numerous studies have shown that raspberries are very rich in antioxidants and have anti-cancer properties.

Raspberry plants can also be easily incorporated into being a part of any edible landscape. Shown here is a black raspberry hedge at Longwood Gardens, Kennett Square, Pennsylvania (Figure 2). Healthy red raspberry stems are reddish-brown while black raspberry stems are greyish-white, and can add interest to the winter landscape.




Figure 1. Fresh red raspberries. Photo by Ken Chamberlain.




Figure 2. A black raspberry hedge. Photo by Gary Gao.

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Pruning Erect Blackberries in the Home Garden

Gary Gao, Ph.D. Associate Professor and Small-Fruit Extension Specialist, OSU South Centers and Adjunct Associate Professor, Department of Horticulture and Crop Science, The Ohio State University
Maurus Brown, Ph.D. Associate Professor Emeritus, The Ohio State University
Ryan Slaughter, Research Assistant, OSU South Centers

Blackberries can make a nice addition to the home fruit garden as a beautiful living hedge with nice flowers and tasty fruits. Gardeners can also enjoy blackberries as fresh fruit, jam or cobbler. Maintaining a neat, clean blackberry planting can be a considerable challenge. A good weed, fertility and pest control program can promote plant growth and quality fruit. Annual pruning of blackberry plants is also essential for high quality fruit production.

Proper establishment of blackberry plants is important. This fact sheet is intended to help gardeners better understand how blackberries should be pruned. Refer to the glossary of terms if you are not familiar with some of the words used in this fact sheet. Thorny, erect blackberries tend to be more aggressive in their vegetative growth than thornless varieties. Thornless, erect varieties tend to be slower to fill in rows and overall are more manageable than thorny blackberries. Blackberry vegetation can be managed through effective pruning practices and still maintain good quality fruit production.



Figure 1. Thornless blackberry bushes loaded with fruits. Photo by Gary Gao, OSU South Centers.

When Is the best time to prune blackberry plants?

Since blackberry plants are not as cold hardy as our fruit crops, it is beneficial to conduct dormant pruning as late as possible. Late March or early April may be typical timing for most parts of Ohio. Floricane bearing cultivars can lose many canes to winter injuries. It is a good idea to wait until the full scope of winter injuries can be assessed.

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Blackberries- Thornless (erect)

- 'Arapaho'- High yielding of the erect types with medium to large fruit
- 'Apache'- A favorite in taste trials. Moderate yields of large fruits in mid-season
- 'Ouachita'- Produces high yields of large fruit late in the season with good storability
- 'Ponca'- (NEW) Ranked highest & sweet in taste trials. Fruit same size & as prolific as 'Ouachita'
- All from Univ. Arkansas breeding program- 'Caddo', 'Osage', 'Natchez' & 'Prime-Ark[®] Traveler' (primocane)





Prime-Ark® Horizon

Released in 2020. Prime-Ark® Horizon is a primocane-fruited variety with very high yield potential, particularly on floricanes. Berries are large and firm, with postharvest potential similar to Prime-Ark® 45. Prime-Ark® Horizon berries have good flavor and retain excellent firmness in storage, with limited leakage and decay.

[Prime Ark® Horizon Flyer](#)



Sweet-Ark™ Ponca

Released in 2019. High-yielding thornless, erect canes with medium-sized fruit with enhanced sweetness and good post-harvest handling traits. Sweet-Ark™ Ponca is the sweetest cultivar released to date. A commercial cultivar with good potential as an early-market berry for shipping, local market production and home garden use.

[Sweet-Ark™ Ponca Youtube Video](#)



Sweet-Ark™ Caddo

Released in 2018. High-yielding thornless, erect canes with medium-large fruit that are sweet with very good fruit flavor. A commercial cultivar with good potential for local market production and home garden use.

[Sweet-Ark™ Caddo Release Flyer](#)
[Sweet-Ark™ Caddo Youtube Video](#)



DASTARDLY DISEASES...

- Viruses
- Susceptibility varies
 - Reds > Blkberry > Blk Rasp > Yellows > Purple
- Anthracnose
- Spur blight
- Cane blight
- Crown gall
- Fruit rot- Gray mold (*Botrytis cinerea*)
- Root rot
 - Rhizoctonia
 - Phytophthora
 - Pythium
- Orange rust
 - Raspberries
 - Foliar only
 - Blackberries
 - Systemic



VILE VILLIANOUS VIRUSES...

- 15 known viruses infecting brambles
- raspberry bush dwarf
- tobacco ringspot
- tomato ringspot
- strawberry necrotic shock viruses
- Impatiens necrotic ringspot
- Blackberry yellow vein
- Unknown or uncharacterized



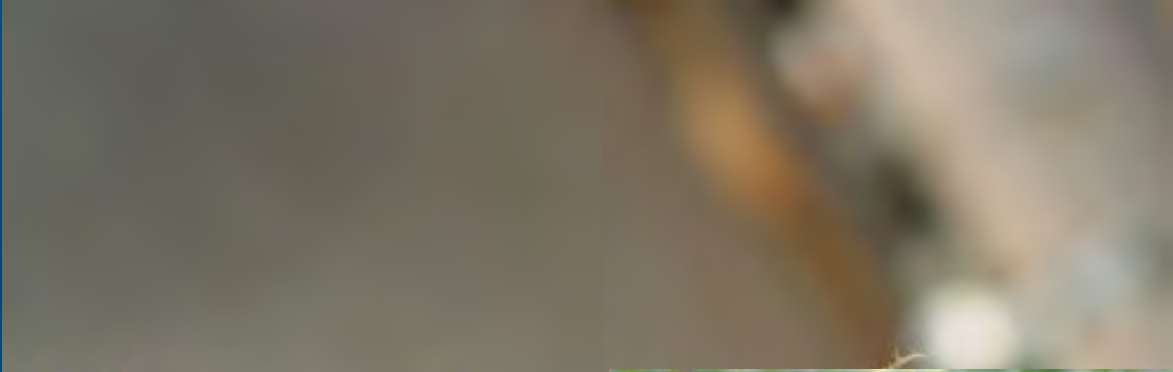
Virus infections...



Cane Blight



Anthracnose



Fruit rot Gray Mold- Botrytis



Root Rot Complex: Phytophthora, Pythium, Rhizoctonia



It all comes down to...



Orange rust- black & purp rasp & blackberries...



Red Raspberries- Late Leaf Rust...



Bramble culture



“Everbearing” brambles pruning...

**ALL CANES ARE
MOWED OFF!!!**



Spotted Wing Drosophila (SWD)

How many have heard of and can recognize this problem?

This insect has changed
EVERYTHING...

About growing small fruit!



Drosophila suzukii- Spotted Wing *Drosophila* a.k.a. Fruit fly or Vinegar fly

- http://www.ipm.msu.edu/invasive_species/spotted_wing_drosophila



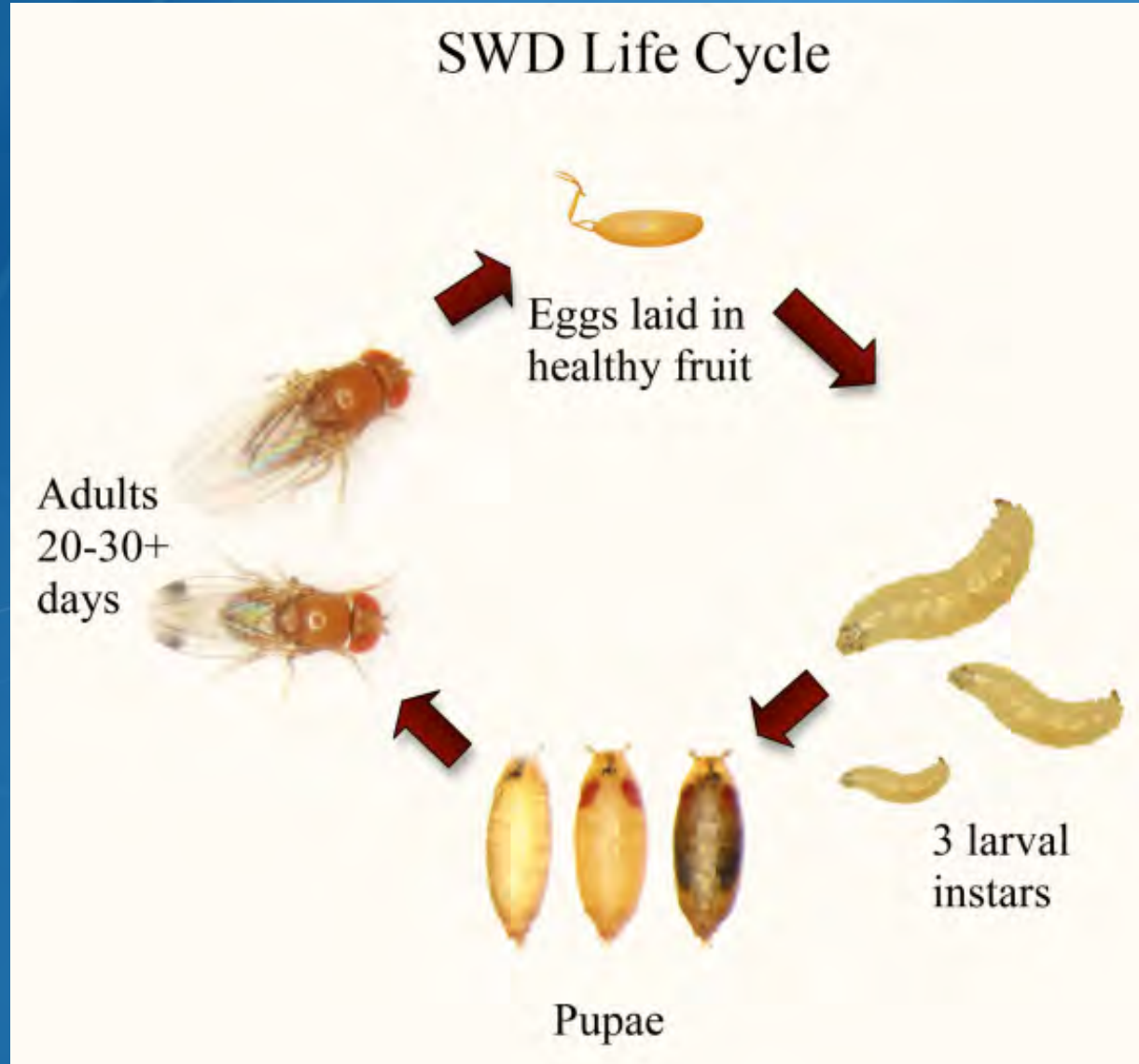
BIG DIFFERENCES...

- Common fruit flies or vinegar flies
- Attracted to & attack damaged fruit
- Attracted to & attack overripe fruit

- SWD attacks HEALTHY, ripening fruit!
- Female cuts slits into fruit
- Lays eggs
- Larvae develop and eat fruit
- Fruit softens from larval feeding



Spotted Wing Drosophila...



Spotted Wing Drosophila (*Drosophila suzukii*)

2 mm

Spots →



Female



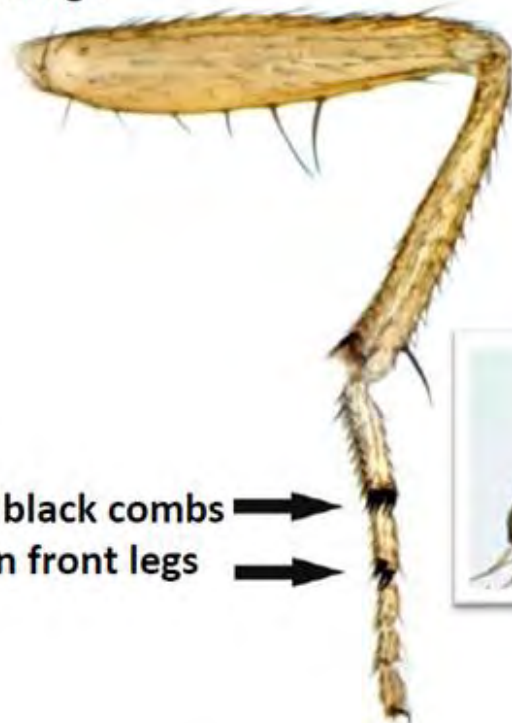
Male

SWD Identification – key characters

Male



Black spot
on wings



2 black combs
on front legs



Female

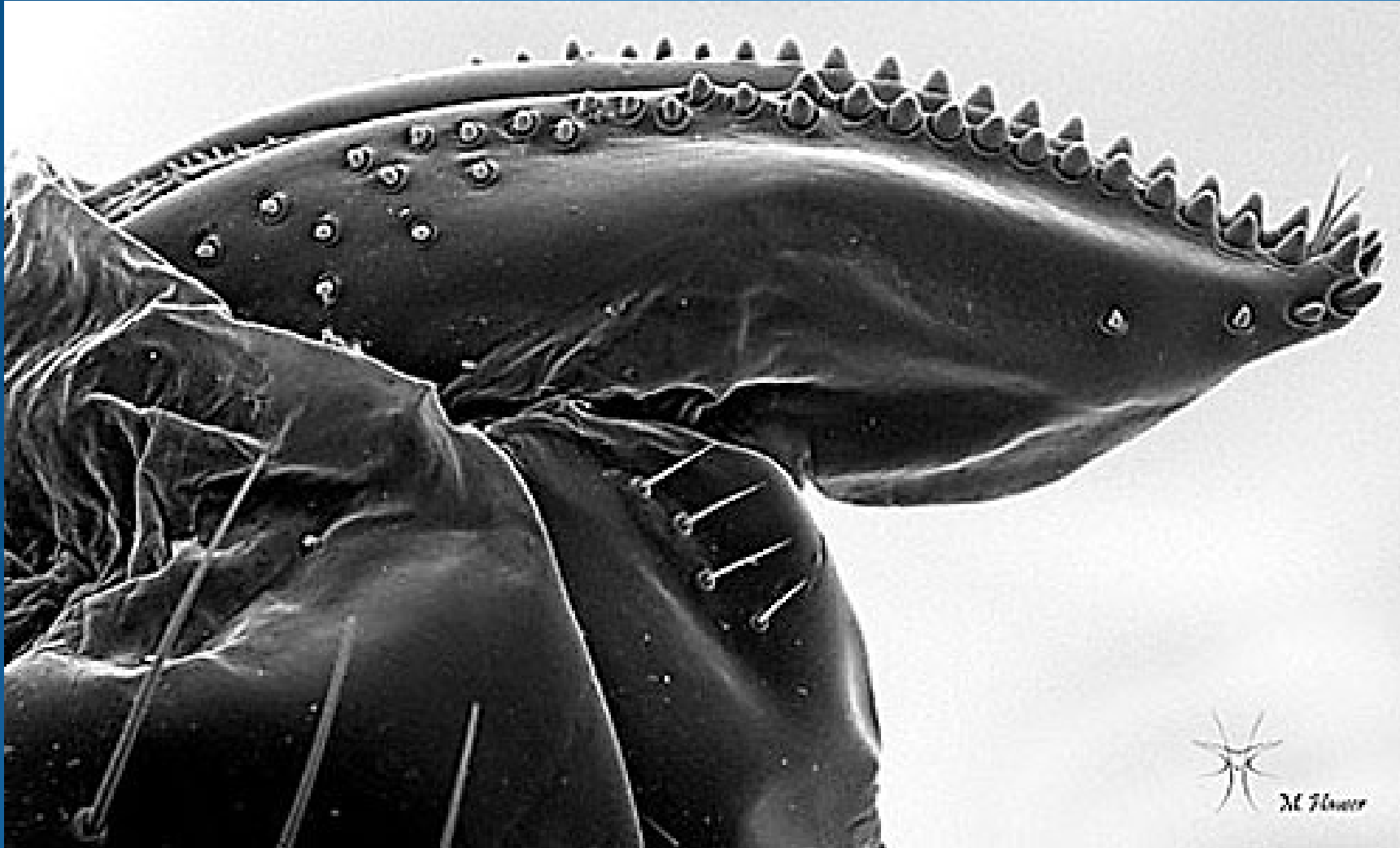


She inserts saw-like device
(ovipositor) into fruits and
lays eggs

Note... Distinct ovipositor on female



SEM of SWD ovipositor...



SWD Larvae in Strawberry...



Potential Hosts for SWD

Crop Host	Crop Host	Wild Host
Apple	Grapes	American Pokeweed
Asian Pear	Italian Plums	Autumn Olive
Asian Plum	Mulberries	Beach Plum
Blackberries	Nectarines	Climbing Nightshade
Blueberries	Peaches	Crabapple
Boysenberries	Persimmons	Fox Grape
Cherries	Plumcots	Japanese Yew
Cold Hardy Kiwis	Raspberries	Kousa Dogwood
Elderberries	Strawberries	Porcelainberry
	Tomatoes	Wild Rose



Control is Imperative so...



SWD ovipositing on Blackberry...



SWD Eggs in Blackberry...



SWD Pupa in cherry...



Why the Concerns...

- Short life cycle (8-16 days based on temperature)
- As many as five generations per year
- Overlapping & asynchronous hatches of generations
- 7-16 eggs laid per day
- Average 384 eggs laid per female



Biology of SWD...

- Eggs hatch in 2-72 hours
- Larvae mature in 3-13 days
- Pupae reside in fruit or outside of fruit for 3-15 days
- In constant temperature, one generation takes 50 days at 54°F (12°C)
 - 21-25 days at 59°F (15°C)
 - 19 days at 64°F (18°C)
 - 8.5 days at 77°F (25°C)
 - 7 days at 82°F (28°C)



SWD Management Brambles...

- Scout using vinegar or yeast traps weekly
- If SWD in traps, start spray program when berries begin to color
- Spray every 7 days!
- Alternate products
- Weekly- salt test ripe fruit
- 1 cup water & 1 Tbs salt
- Place fruit in brine & look for wigglers!



SWD Larvae in Raspberry...



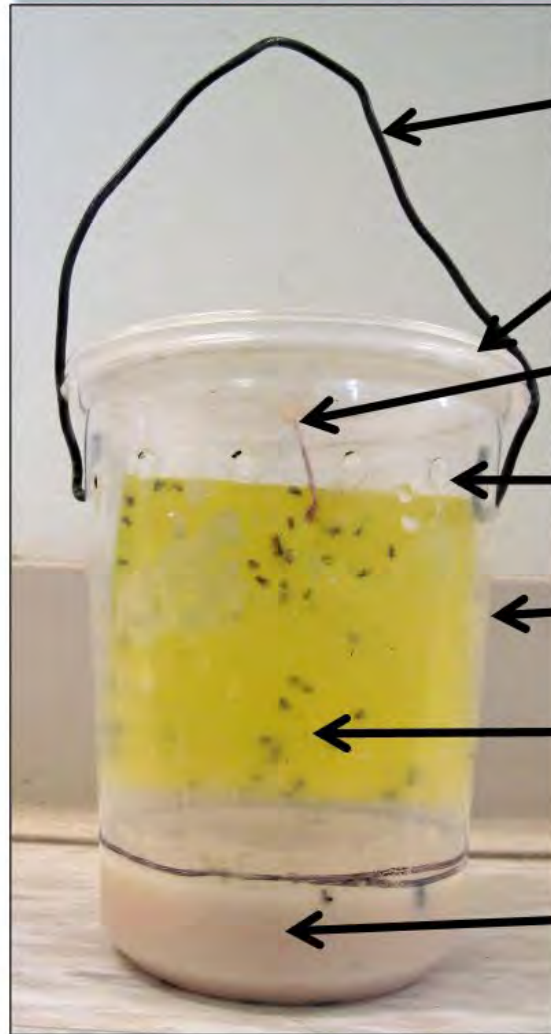
If not...YUMMO!!



SWD Traps- Michigan State University

MICHIGAN STATE
UNIVERSITY
EXTENSION

Building a spotted wing drosophila trap



12" of 14 gauge solid core wire.

Deli cup lid

Plastic-coated paper clip poked through lid; hole sealed with hot glue to prevent water leaking in trap.

Melt 3/16" diameter holes in side of cup using a soldering iron.

32 oz plastic deli cup

Yellow sticky insert cut down to 3.5"x3"

5 oz of yeast bait. Recipe:
1 Tablespoon active dry yeast
4 Tablespoons white table sugar
12 oz water



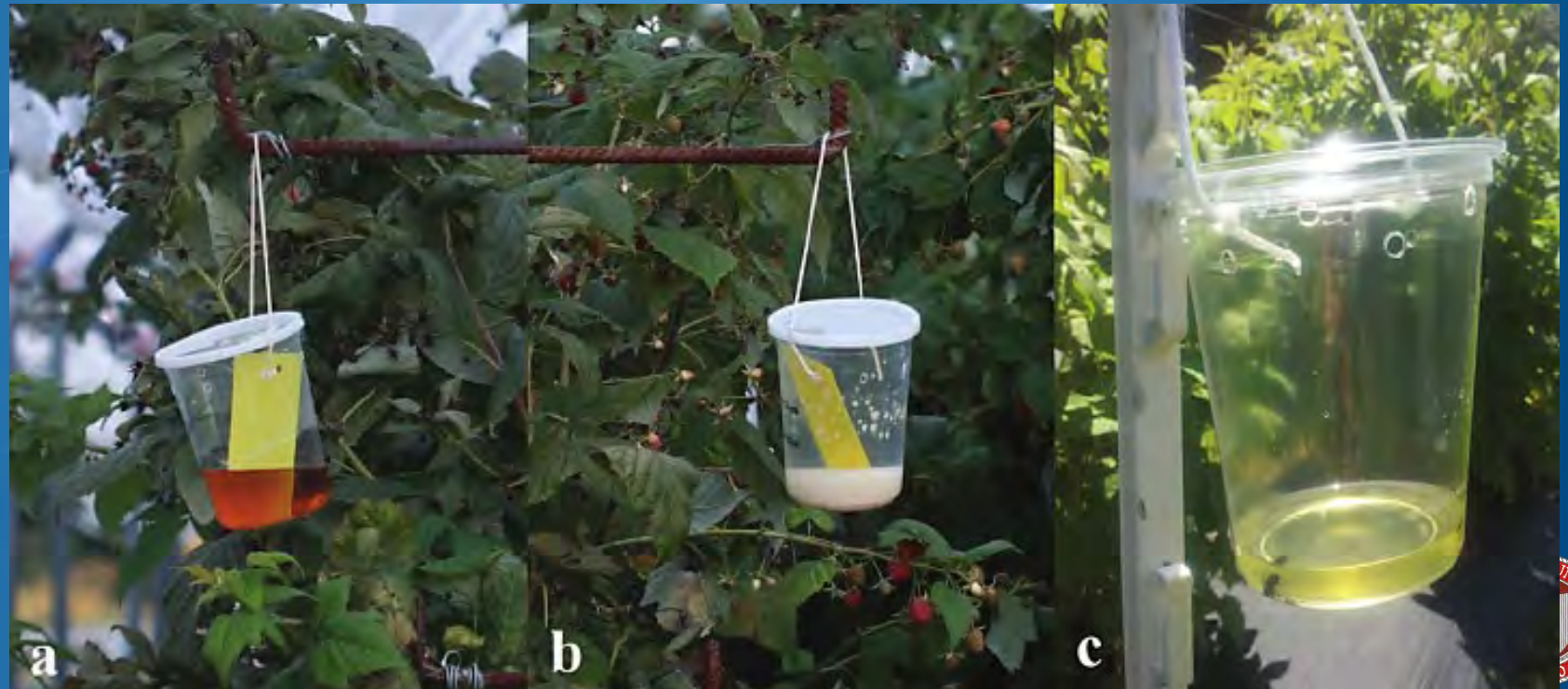
Making SWD Scouting Traps...

- <https://extension.oregonstate.edu/pests-weeds-diseases/insects/monitoring-vineyards-spotted-wing-drosophila>

Apple Cider
Vinegar & Yellow
Sticky Card

Yeast, Sugar
& Yellow
Sticky Card

Pure Apple
Cider Vinegar



Select Product(s) to Use...

Spotted wing drosophila in home fruit plantings: Insecticide options

(extrapolated from data for control in commercial fruit production in OR, WA, CA, MI, NJ, NC, FL in 2011 and 2012):

Efficacy rating	Active ingredient ¹	Residual activity (days)	Pre-harvest interval (PHI) ²						
			raspberry, blackberry	blueberry	strawberry	grape	cherry	peach	plum
Very effective	bifenthrin	7-10	3 days	X	X	X	X	X	X
	cyfluthrin	7-10	X	X	X	3 days	X	X	X
	permethrin	7-10	14 days	14 days	14 days	X	X	7 days	X
	esfenvalerate	7-10	21 days	14 days	X	X	14 days	14 days	14 days
	gamma-cyhalothrin	7-10	X	X	X	X	14 days	14 days	14 days
Effective	malathion	5-7	1 day	1 day	X	X	3 days	7 days	X
	spinosad	3-5	3 days	3 days	1 day	7 days	14 days	7 days	7 days
Moderately effective	carbaryl	10	7 days	7 days	7 days	7 days	3 days	3 days	3 days
	acetamiprid	1-3	1 day	1 day	1 day	7 days	7 days	7 days	7 days
Unrated but likely to be effective	pyrethrins + PBO	1-3	0 days	0 days	0 days	0 days	0 days	0 days	0 days

¹ Color code: For resistance management, rotate among products from different chemical groups: spinosyns (yellow in chart below), pyrethroids (pink in chart), organophosphates (blue in chart), carbamates (green in chart), and neonicotinoids (gray in chart).

² The pre-harvest interval (PHI) is the minimum number of days required to wait after application of the pesticide, before it is safe to harvest. An 'X' in chart means that the product is **not allowed** for use on that crop.



Who Cares?

