

University of Vermont  
PSS 195: Sustainable Orchard and Vineyard Management Summer 2015  
3 Credit Hours  
Tuesdays and Thursdays, June 16-July 9, 9:00 am – 3:00 pm  
Course Syllabus

Instructor: Terence Bradshaw  
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63 Carrigan Drive  
University of Vermont  
Burlington, VT 05405  
Email (best): tbradsha@uvm.edu  
Phone: 802 922-2591  
Office hours by appointment  
Please note: This is my campus address, but I am based at the Hort Farm the majority of the time.

Class site: UVM Horticulture Research Center  
65 Green Mountain Dr, South Burlington, VT 05405

Students are responsible for transport to the HRC for class each day.  
Directions to the Hort Farm:  
<http://www.uvm.edu/~hortfarm/?Page=directions.html>

Students will learn principles and practices of commercial orchard and vineyard crop production, including: site selection and preparation; cold hardiness development; varietal selection; tree and vine training and trellising systems; nutrient, water and pest management; harvest and postharvest considerations. Special emphasis will be placed on environmental and economic sustainability of fruit production systems. The course will cover both orchard and vineyard crops suitable for production in northern New England, and students will have opportunities to explore specific crops in greater depth if they so wish. At each course meeting, we will apply knowledge of integrated horticultural and pest management practices in a real farm setting. Pre/co-requisites: PSS 10 or 21 or 1 semester biology or permission. The course format will consist of a combination of classroom lectures, hands-on fieldwork, and visits to local commercial orchards and vineyards.

Online materials:

All readings are listed on the UVM Blackboard site: <http://bb.uvm.edu> under the 'Course Materials' tab.

### Course Texts:

The following text is required reading for the course:

- Temperate Zone Pomology, Melvin Neil Westwood. Tiber Press, Portland, OR.  
*This text is print-to-order only and will be made available through the UVM Bookstore.*

Optional course texts include:

- 2014 New England Tree Fruit Management Guide. USDA Cooperative Extension Service, Universities of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. Available from the instructor.
- Dami, I, B. Bordelon, D.C. Ferree, M. Brown, M.A. Ellis, R.N. Williams, and D. Deehan. 2005. Midwest Grape Production Guide. Ohio State Univ. Ext., Bull. 919-05.  
<http://ohioline.osu.edu/b919/pdf/b919.pdf>  
*A print copy can be ordered here:* <http://estore.osu-extension.org/productdetails.cfm?SKU=919>
- Wolf, T.K., editor. 2008. Wine Grape Production Guide for Eastern North America. Northeast Regional Agricultural Engineering Service, Coop. Ext., NRAES-145.:  
[http://palspublishing.cals.cornell.edu/nra\\_order.taf?function=detail&pr\\_id=178&UserReference=054EB70E](http://palspublishing.cals.cornell.edu/nra_order.taf?function=detail&pr_id=178&UserReference=054EB70E)
- Plocher, T. and R.J. Parke. 2008. Northern Winework: Growing Grapes and Making Wine in Cold Climates. Northern Winework, Inc. Hugo, MN:  
[http://www.amazon.com/Northern-Wineworks-Growing-Climates-Edition/dp/1934259187/ref=sr\\_1\\_1?s=books&ie=UTF8&qid=1337012513&sr=1-1](http://www.amazon.com/Northern-Wineworks-Growing-Climates-Edition/dp/1934259187/ref=sr_1_1?s=books&ie=UTF8&qid=1337012513&sr=1-1)
- 2014 New York and Pennsylvania Pest Management Guidelines for Grapes  
<http://ipmguidelines.org/grapes/>

### Tentative Class Schedule

1. 6/16 Introduction, Site Selection, Botany, Mechanics of Cold Damage
2. 6/18 Pruning, Training, Trellis, Freeze protection
  - a. Field trip, Shelburne Orchard, and Lincoln Peak Vineyard
3. 6/23 Variety Selection, Nutrition, Groundcover, Herbicide Injury, Pest Management Assignments
4. 6/25 VT Grape & Wine Council Annual Meeting
  - a. Vineyard economics
  - b. Grower panel
  - c. Pest management
  - d. Winemaker roundtable
5. 6/30 Field trip, Southern Champlain Valley Orchards

6. 7/02 Pest Management
  - a. IPM overview
  - b. Vineyard scouting and pest identification
  - c. Sprayer operation
7. 7/07 Ripening and Harvest considerations
8. 7/09 Project Presentations

**Grading:**

**Project, 25% :**

Students will develop a farm management plan for a commercial fruit farm with 10-year financial records.

**Field Practicals, 25%:**

Applied, hands-on activities will be performed in orchards and vineyards to develop skills introduced in classroom lectures. Students will be assessed on: pruning, canopy management; cropload assessment and adjustment; fertility plan development based on soil and plant tissue analysis; and presentation of key pests of orchard and vineyard plantings and methods for their management.

**Quizzes, 25%:**

Short quizzes will be presented each class to review the material presented that day.

**Professionalism, 25%:**

Students are expected to attend all classes, participate in activities, and act in a professional manner.

**General Policies**

1. Everyone must attend all classes.
2. All assignments and presentations must be completed on time. Late assignments and presentations will not be accepted.
3. Please turn off your cell phone and refrain from texting or other messaging when class is in session.
4. All students are expected to adhere to UVM Student Code of Academic Integrity. Offenses against the Code of Academic Integrity are deemed serious and insult the integrity of the entire academic community. Any suspected violations of the Code are taken very seriously and will be forwarded to the Center for Student Ethics & Standards for further intervention. To read the Code of Academic Integrity and learn more about the Center for Student Ethics and Standards, visit their website at:  
<http://www.uvm.edu/cses/?Page=ah.html&SM=ahmenu.html>
5. The HRC is a working research farm. All students must follow HRC Use Policies and attend an HRC orientation session, held the first day of class.  
[http://www.uvm.edu/pss/dept/hort\\_farm/HRCpolicies.pdf](http://www.uvm.edu/pss/dept/hort_farm/HRCpolicies.pdf)

## PSS 195: Sustainable Orchard and Vineyard Management Final Project

You are asked to select a plot of land 5 to 20 acres in size with the intent of growing orchard and/or vineyard crops. You may select any site as long as you can get a soil map of the site. You are asked to develop a plan to plant the land. A complete operations plan, with financial estimates, must be developed for at least 7 years. All major decisions must be explained and well documented.

### **The Plan**

The bank wants you to develop a complete month-by-month schedule for the development, planting and maintenance of the farm from January 1, 2016 until after harvest in autumn 2021. You must have a detailed plan describing the farm you will develop and how you intend to market the fruit. Likewise you must describe operations, equipment and supplies you will need and the expected expenses.

The purpose of the plan is **to demonstrate to the bank** (and the instructor) **that you understand the horticultural science necessary to be a successful fruit producer**. Thus, the focus of the project should be on the management decisions you must make, what factors you must consider and, most importantly, **WHY** you have made specific management decisions. You must rely on data from the printed literature to justify your decisions.

**As an alternative**, you may develop a similarly-themed management plan for your own property or other unique site that may be used for your business or professional career. Use this as an opportunity to develop a real-world plan that you may implement as a result of your work in this course. Please discuss specific plans with the instructor before proceeding.

Your portfolio and plans should include:

- I. A complete description of the site: description of location, site, slope, soil type, and the important climate meteorological information. Is the site a good site and a wise investment? Why or why not? What makes the site a good candidate for an orchard or vineyard?
- II. The farm layout and block plan. Include a map showing roadways, buildings, irrigation system, detail of planting scheme, tree/vine spacing, density, layout, trellis, etc. Why are rows oriented in specific directions? Why did you select an irrigation system? What factors influenced the layout of the farm?
- III. Varieties, rootstocks (if used), number of trees/vines to be ordered, sources of stock, prices, shipping, etc. Present information on expected plant growth (time to fill the space), trellis and training system, time of harvest, production potential, and fruit quality expectations.
- IV. Site preparation and maintenance requirements. Describe groundcover management program, fertility monitoring, and fertilizer application.
- V. Irrigation system to be used, if any. Discuss source of water, water treatment and amount of application. Why was a specific irrigation system selected? What are the advantages and disadvantages of this system? Does the system have multiple use or benefits?
- VI. Select three major diseases and three major arthropod pests you will manage. Describe your control methods. How will you deal with weed and vertebrate pests?
- VII. Fruiting. Approximate the yield for years 1- 5. Discuss fruit thinning practices you will use, anticipated problems, and other economic considerations in the cropping the orchard/vineyard during these years.

- VIII. The economic schedule of expenses and cash flow for years 1- 7. Project cash flow, annual expenditures, labor requirements, etc. Include how much money you will need from the bank each year to keep the farm working and possible debt reduction. You may start with a cash balance of \$150,000.00. Use graphs or charts to help explain your debt and revenues. The bank loan is for a period of 10 years at 6% annual interest.

#### Project Grading

The project will be graded on your integration of the course material into a sound horticultural operation. The primary focus is on the horticultural and economic feasibility of the proposal.

Be sure to thoroughly discuss each of the topics listed above. Use diagrams, tables, charts, etc., if they are useful to understanding the discussion and they are mentioned within the text. Your logical thought pattern should be evident in the discussion.

The project will be grade on the following elements: site evaluation (10%); vineyard layout and design (10%); variety selection for the site and intended market (10%); horticultural management decisions and annual management (20%); estimates and economics (10%); neatness (10%); grammar and mechanics (10%); class presentation (20%). The final product must be typed-written. Electronic submission is preferred via email attachment. Files over 1 MB in size can be sent through the UVM File Transfer Service: <https://www.uvm.edu/filetransfer/>. YOUR HORTICULTURAL DECISIONS ARE THE MOST IMPORTANT CONSIDERATION FOR EVALUATIONS.

You will be presenting a 15 minute synopsis of your vineyard plan at the final class meeting on July 10. This does not have to be the complete project, but should give us a good idea of where you are going with your vineyard. Consider it a pre-qualifying interview with the banker.

***Final, Written Project DUE DATE: Friday, July 10. Late assignments will absolutely not be accepted.***