

AGRI 198 - Special Topics: California Orchard Production and Management

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Office Hours: T 10:30 – 11:30, 1:30 – 2:00, 3:00-3:30, 4:30-5:30, and R 10:30 – 11:00 and by appointment.

Semester Offered: Fall 10
Class & Lab Schedule: Lec MW 5:00 -6:50; Lab W 2:00-4:50
Course Units: 3

Course Description:

An evaluation of various decisions made in the management of fruit and nut trees. Management topics will include studies of climate zones, soil selection, financing, farm organization, irrigation systems, field layout, varietal selection, nutritional needs, harvesting, labor management, marketing, and budgeting. The student will be required to prepare a budget and calendar of orchard operations. Laboratory required.

Course Objectives: *At the conclusion of this course, the student should be able to:*

- Prepare an orchard budget and cost analysis.
- Prepare a seasonal sequence of orchard crop cultural practices in the California.
- Explain the basic economic concepts of orchard production and marketing.
- Describe general cultural practices of orchard crops.
- Explain market standards, market agencies, market agreements, and marketing of orchard crops.
- Explain the botany of varieties and development of fruit and nut crops.

Text Required: Stanislaus Orchard Handbook

Course Content:

1. Industry Overview
 - A. Acreages and tonnage
 - B. Trends
 - C. Outlook
 - D. Observations

2. Pruning Principles
 - A. Light distribution
 - B. Carbohydrate balance
 - C. Apical dominance
 - D. Renewal of the bearing surface

3. Pruning and Training Systems
 - A. Training systems for various crops
 - B. Pruning systems for:
 1. varieties that bear terminally on spurs
 2. varieties that bear laterally on spurs
 3. varieties that bear laterally on shoots
 - C. Bearing habits of different species and varieties
 - D. Cost management

4. Pollination
 - A. Mechanisms
 - B. Problems with various crops

- C. Honey bee management and evaluation
- 5. Climatic Requirements and Problems
 - A. Growing season (days)
 - B. Adaptation of varieties
 - C. Chilling requirements
 - D. Frost protection
 - E. Heat damage
- 6. Site Selection
 - A. Evaluating soils for orchards
 - 1. Physical
 - 2. Chemical
 - 3. Biological problems
 - B. Water quality and cost
 - C. Interpreting soil, water, and nematode reports
 - D. Costs of overcoming site problems
 - E. Real estate considerations
 - 1. Land cost and future values
 - 2. Zoning
 - 3. Neighbors and urban growth
 - 4. Water and drainage rights
- 7. Orchard Development
 - A. Soil profile modification
 - B. Leveling
 - C. Fumigating
 - D. Developing the irrigation systems
 - E. Drainage systems
 - F. Ordering and negotiating for trees
 - G. Orchard layout designs
 - H. Densities
 - I. Planting procedures
 - J. Care of new trees
 - K. Development calendars – options
- 8. Irrigation
 - A. Requirements
 - B. Monitoring moisture
 - C. Water budgets
 - D. Systems
 - E. Costs
- 9. Pest Management
 - A. Pests – insects, mites, diseases, viruses, and vertebrates
 - B. Typical spray programs for various crops
 - C. Economic and treatment thresholds
 - D. Determining cost effectiveness
 - E. Least-cost alternatives
 - F. Purchasing pesticides and services
- 10. Management
 - A. Calendar of operations
 - B. Cash-flow analysis
 - C. Crop budget
 - D. Cost analysis

- E. Debt management
 - F. Tax and accounting problems peculiar to orchards
 - G. Assessing current financial position
 - H. Developing vs. purchasing
 - I. Labor management
 - J. Cost control
 - K. Economics of scale
 - L. When is it time to replace a block of trees?
11. Rootstocks – how to select
 12. Selecting Varieties – considerations
 13. Developing the Crop
 - A. Sizing
 - B. Thinning
 14. Harvesting and Transport
 - A. Maturity evaluation
 - B. Harvest timing and scheduling
 - C. Balancing quality, tonnage, and size criteria
 - D. Labor management
 - E. Estimating equipment requirements
 - F. Transporting
 - G. Enhancing maturity for early or light harvest
 15. Marketing
 - A. Contracting
 - B. Private processors, packers, and shippers
 - C. Cooperatives
 - D. Brokers
 - E. Self marketing
 - F. Exporting opportunities
 - G. Direct marketing and market development
 - H. Legal protections for growers
 - I. Bargaining Associations
 - J. Concept of pooled tonnage
 - K. Marketing orders
 - L. Outlook – consumer trends

Laboratory Activities: Individual Laboratory Activities are designed to support course objectives.