Introduction to Edible Landscaping

Barbara Poff
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Overview

Definition:

Edible landscaping is the use of food plants as design features in a landscape. These plants are used both for aesthetic value as well as consumption.

Important Note:

Edible landscapes encompass a variety of garden types and scales but do not include food items produced for sale.
Overview

Combining Form and Function

Image Source: Rosalind Creasy
Overview
Combining Form and Function

Image Source: Rosalind Creasy
Importance of Edible Landscaping

- According to the EPA, only 1% of our 285,000,000 person population claims farming as an occupation. What does this mean? Our children are growing up in a world farther and farther removed from agriculture.

- So few US children can answer where milk comes from that it prompted the USDA to create initiatives to connect children with the source of food.

- A general dissociation from the natural world is Nature Deficit Disorder, an issue identified by Richard Louv.
Importance of Edible Landscaping

- Promoting gardens in parks, on rooftops and in front yards will help both youth and adults re-connect with their food and nature.

- Horticulture therapy is the use of gardening to provide mental and physical healing and wellness. In young people, horticulture therapy has shown to decrease violence and behavioral issues. It has also proven effective in improving memory and attention span in diagnosed ADHD patients (University of Minnesota, 2012).
Edible Landscape vs. Traditional Landscape

Image Source: Carmia Feldman
Edible Landscape vs. Traditional Landscape

Image Source: Rosalind Creasy
Edible Landscape vs. Traditional Landscape

The Pros

- Environment – decreased food miles, reduced reliance on fossil fuel supported calories
- Health - food security, horticulture therapy, healthy food choices

In general, edible landscaping promotes sustainable gardening practices that maximize water efficiency, support wildlife and reduce the use of chemicals in the landscape.
Edible Landscape vs. Traditional Landscape

The Cons

- Time – increased maintenance requirements, seasonal planting, regular garden planning
- Inputs – increased water needs
- Practices - increased plant waste typically requires healthy compost pile
History of Edible Landscaping

- Integrating food growing with other landscape uses (recreational, aesthetic, etc.) is not a new concept.
History of Edible Landscaping

parterres & kitchen gardening

Image Sources:  www.nationaltrust.org/uk/ & C. Napawan
History of Edible Landscapes

Horticultural practices

Image Sources: C. Napawan
Designing Edible Buildings

Rios Clementi Hale Studios

Image Source: http://blogs.discovermagazine.com/
Growing Food Movement

Image Source: AP Images
Growing Food Movement

Image Source: http://livinglivelier.blogspot.com/
Edible Landscaping

Site Preparation and Maintenance
Challenges and Opportunities

Geoffrey Wood
Master Gardener
UC Cooperative Extension
Diverse and Complex Plant Systems

Apply knowledge in crop production to planting and maintaining an integrated, multi-functional landscape system.
Diverse and Complex Plant Systems

- Increases diversity
- Eliminates monoculture
- Creates habitat for beneficial organisms
Diverse and Complex Plant Systems

- Plant species and varieties for yield and aesthetics

- Consider pollination requirements
Sun and Shade Effects

- Crops need full sun and can produce attractive shade
- Affects performance and yield
  - Need at least 6 hours of sun per day
- Plan for seasonal variation in shade and sun angle
Soil Management

- Limitations compared to traditional gardens
- Raised beds can still work
- Mulches are useful anywhere
Inputs Required

- Time and labor
  - Attention, training, maintenance

- Fertilizer
  - Frequency and nitrogen
  - Natural vs. synthetic

- Water
  - Amount
  - Variation in application methods
Planting and Re-Planting Annual Crops Among Perennials

- Increases diversity
- Difficult to prepare soil for annual crops
- Woody roots interfere
- Disturbs perennial root systems
Maintaining Ornamental Function

- Ornamental value of some food crops wanes
- Remove crop debris
- Harvest ripe fruit and mature produce
Green Waste Management

- Crops can increase plant debris and green waste
- Debris can be composted
Pests and Weeds

- Pest management often more demanding with edibles
- IPM more complex

- Weed management without herbicides
Edible Landscaping

Site Preparation and Maintenance

Soils
Soil Functions

- Physical support for plants
- Water reservoir
- Nutrient reservoir
- Air reservoir
Soil Physical Components

Total Pore Space

- Water: 25%
- Air: 25%
- Solids: 50%

Minerals and Organic Matter
Soil Properties

- Physical Properties
  - Texture
  - Structure

- Chemical
  - 17 essential elements (N, P, K and friends)
  - Soil reaction (pH)
  - Salinity (EC)
  - Toxic ions (sodium, boron)
Soil Structure

- The arrangement of soil solids into aggregates and the relative pore space created

- Good structure:
  - Forms small granules readily
  - Mix of large and small pores

- Influences:
  - Aeration
  - Drainage
  - Root growth
Soil Structure – Organic Matter

- Organic matter (plant debris, humus, etc.)
  - Provides binding agents
  - Improves structure
  - OM breaks down over time
Soil Texture

- Percentage by weight of sand, silt, clay

- Influences:
  - Water holding capacity
  - Water movement
  - Nutrient holding capacity
  - Tillage and workability

- Major textural classes:
  - Sands, silts, loams, clays
Soil Reaction - pH

- Acidity or Alkalinity of Soil Solution
  - 7.0 = neutral
  - <7.0 = acidic;
  - >7.0 = alkaline
- Crops grow best at 5.5 – 7.5
Soil Management Considerations in Edible Landscaping

- Routine replanting annual crops
- Inter-planting edible crops into existing landscape areas
- Fertilizer management for edibles vs. ornamentals
- Container growing
Routine Replanting Annual Crops

- Dedicate bed space if possible
- Amend before planting with OM, perlite, etc.
  - Difficult to amend area after landscape site is established
  - Eases transplanting
Inter-planting Edible Crops Into Existing Landscape Areas

- Can be difficult to inter-plant seasonal crops routinely among established ornamentals
  - Difficult to dig and cultivate soil
  - Disturbs roots of established ornamentals

- Do soil conditions meet needs of seasonal or perennial edible plants being added?
Container Growing

- Avoids soil management issues
- Select quality potting media
  - Bark, forest products, coir
- Leach before planting
- Assure good drainage
  - No gravel in container bottom
Edible Landscaping

Site Preparation and Maintenance

Irrigation
Traditional Garden Layout
Traditional Garden Layout

Fig. 9. Typical design (layout) of a drip system for a home vegetable garden.
Edible Landscape Layout
Edible Landscape Layout

- Think of the possibilities!
Water Use

- What drives water use of plants?
  - Plant species \( (ET = Eto \times Kc) \)
  - Planting density
  - Microclimate factors
Water Use - Hydrozone
Water Use

- Evapotranspiration Rates

![Graph showing water use in Sacramento Valley and San Joaquin Valley by month.](image-url)
Water Use

New Legislation!

MAWA* = (Eto)(0.7)(LA)(0.62)

Eto = Reference evapotranspiration (inches per year)

0.7 = ET adjustment factor

LA = Landscaped area (square feet)

0.62 = Conversion factor (to gallons)

*Maximum Applied Water Allowance = _____ gallons/year
Water Use

Example of Maximum Applied Water Allowance (MAWA)

- Sacramento area (annual historical ET\textsubscript{o} = 52 in)

- Hypothetical Landscape Area = 5,000 sq ft

- MAWA = (ET\textsubscript{o}) (0.7)\(^*\) (LA) (0.62)\(^**\)

- MAWA = (52) (0.7) (5,000 sq ft) (0.62)

- MAWA = 128,400 gallons per year

\(^*\)ET Adjustment factor

\(^**\) Conversion factor from inches to gallons
Water Use

Higher density = greater water requirement
Water Use

Varying Microclimates
Conserve Water

- Conserve water in your edible landscape by:
  - Hydrozoning
  - Scheduling irrigations based on plant needs
  - Making sure sprinklers/drip systems work properly
  - Using mulch and soil amendments effectively
Conserve Water

Hydrozone: Place plants with similar water needs together and irrigate them accordingly
Conserve Water

- Use Efficient Systems
  - Hand watering can be very efficient!
  - Drip (low flow, low volume and includes mini-sprinklers, tape, soaker hoses, etc.) also efficient
Conserve Water
Conserve Water

- Drip Irrigate Edibles to Reduce Soil Evaporation and to Apply Water Directly into Root Zones
Many Types of Drip Systems
Sprinkler System Retrofitting

- Retrofit a sprinkler system to use or convert an existing 1/2" riser or sprinkler head to a 1, 4, 6, or 12-outlet drip system without disrupting the flow through the rest of the line
Sprinkler System Retrofitting
Conserve Water

Improve water-holding capacity and/or drainage with compost mixed evenly into soil (6 inches to 1 foot)
Conserve Water

Apply mulch around plants
Other Methods to Conserve Water In and Around Edible Landscapes

- Remove weeds to reduce competition for water
- Irrigate established plants deeply and infrequently
  - Avoid watering every day
  - Water a few inches below the current root system during each watering to encourage deep rooting
- Avoid over-fertilizing
  - Creates flushes of weak growth
  - Increases water requirement
Graywater Systems

Laundry-to-landscape systems do not require a permit if they:

- direct flow back to the sewer (e.g., a 3-way valve)
- have valves and direction of graywater flow clearly labeled
- supply graywater to landscape plantings only on the home owner’s property
- include an operation and maintenance manual
- discharge graywater underneath a 2-inch cover of mulch, plastic shield, or stone covering.

NEVER use graywater on edible plants. If using graywater near edibles, be sure not to splash on them.
Edible Landscaping

Site Preparation and Maintenance

Green Materials Management
Green Materials Management

Important uses for organic materials in edible landscapes:

- Soil Amendments (mixed into the soil)
- Mulches (applied on top of the soil)
Soil Amendments: Compost

- Improves water and nutrient holding capacity
- Improves drainage in heavy soils
- Prevents/reduces erosion
- Improves soil aeration
- May decrease chemical fertilizer requirement
- Increases number and range of microbes
Waste Management

- The CA Waste Management Act (Assembly Bill 929)
  - Divert 25% of organic matter destined for landfills by 1995
  - Divert 50% of organic matter destined for landfills by 2000

- A.B. 341 (passed 2011)
  - 75% solid waste landfill diversion through source reduction, recycling and composting by the year 2020
Soil Amendments: Compost

Compost is not a fertilizer but does contain small amounts of:

- Nitrogen and phosphorus (mostly in organic forms)
  - Released slowly to plants
  - Not readily leached from the topsoil
- Micronutrients that are essential for plant growth
Soil Amendments: Compost

How do you make high quality compost?

- Pile should be 3’ x 3’ x 3’ or larger
- Maintain correct C:N ratio (30:1) by adding equal volumes of both ‘greens’ and ‘browns’
- Turn pile weekly
- Keep pile moist but not soggy (aeration)
- Maintain a high enough temperature (135°F/3days)
- Cure before using
Soil Amendments: Compost

How to Amend Soil with Compost

- Amend entire planting site or bed when possible, adding at least 30 percent compost (by volume) to original soil.

- Thoroughly mix compost 6 inches to 2 feet deep (depending on depth of expected root zone).

- Seed edibles directly into garden soil amended with compost or transplant seedlings/container plants into amended soil at same depth they were in their containers.

- Irrigate immediately and maintain a moist root zone through establishment.
Avoid Adding Compost/Soil Amendments to Tree Planting Sites

- Roots may circle the planting hole resulting in a root bound plant not able to support the upper structure
Mulch

- Reduces water evaporation from soil
- Prevents/reduces erosion
- Buffers soil temperature
- Reduces weeds
- Prevents mechanical weed whip/lawnmower damage to tree trunks
Mulch Volcano excavated to expose buried trunk. Mulch should not be touching the trunk. Some trees develop girdling roots and/or disease problems.
Mulch

Compost Criteria when used as a Mulch

- Apply 2.5-3.5 inches of mulch on top of the soil
- Carefully spread compost around the base of plants using a shovel or rake
- Avoid applications around tree trunks
- Apply outward toward dripline of trees
Mulch

Bark chips or nuggets

- Bark nuggets (½ to 1 ½ inches) are more stable than smaller bark or woodchips and do not break down as quickly
- The larger the particle size, the greater the depth to provide adequate weed control
**Mulch**

**Fabric Mulch**

- Also called geotextiles or weed barriers
- Woven and non-woven polypropylene polymers (synthetic material).
- Some polypropylene polymers oxidize and degrade under ultraviolet light (cover with bark or woodchips)
Mulch

Fabric Mulch (cont’d)

- Best used around shrubs and trees (long-term plantings)
- Cut slits in fabric and add it after adding edibles to your landscape
- Allows water, fertilizer, and oxygen to penetrate soil
- Excellent weed control agent
- Bark or wood chips may be added on top
Mulch

Landscape fabric

Landscape fabric under mulch
Site Preparation and Maintenance

Pest Management
Integrating Pest Management into your Edible Landscape

“Integrating”

- What IPM techniques have been mentioned so far?
  - Choose well-adapted species and variety selection
  - Avoid over-fertilization and overwatering that can lead to pest problems
  - Weed control – use of herbicides and mulches
Integrated Pest Management
www.ipm.ucdavis.edu

- Same IPM approach for Edibles and Ornamentals
  - Expectations are important

- Correct Pest Identification - Vigilance!
  - Beneficial insect identification

- Cultural and Mechanical Controls

- Conservation of Biological Controls

- Chemical controls as a last resort
Cultural Controls for Pests in Edible Landscapes

 Select low-pest species
   Hint: Do you see chard in the list below?

 Timing

 Rotation?
   Biofumigation

 Pulling plants to break pest cycle

How to Manage Pests
Pests in Gardens and Landscapes—Vegetables and Melons

Search vegetables:  Go

Vegetables and melons

- Artichokes
- Asparagus
- Beans
- Broccoli
- Brussels sprouts
- Cabbage
- Cantaloupe
- Carrots
- Cauliflower
- Corn
- Cucumbers
- Eggplant
- Lettuce
- Onions and garlic
- Peas
- Peppers
- Potatoes
- Pumpkins
- Spinach
- Squash
- Tomatoes
- Watermelon
Pest Management in Edible Landscapes

- Pesticide and Label Information
  - For edible plants
    - Limited number of applications per year
    - PHI – Pre-Harvest Interval
  - For ornamental plants
    - May or may not limit applications per year
    - Generally do not include PHI
Pesticides in Edible Landscapes

- Pay attention to label!
  - Applications per Season
  - Minimum Days to Reapply
  - Pre-harvest Intervals

- Example Label for edible plants - spinosad

<table>
<thead>
<tr>
<th>Crops</th>
<th>Pests Controlled</th>
<th>Maximum Number of Applications Per Season</th>
<th>Minimum Days To Wait Before Reapplying</th>
<th>Minimum Days To Wait From Last Application To Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cucurbits</strong> including cucumber, summer and winter squash, muskmelons (cantaloupe, honeydew, etc.) pumpkin, edible gourds, and watermelon</td>
<td>Leafminers, Thrips, Worms (caterpillars)</td>
<td>6</td>
<td>5</td>
<td>All except cucumber 3 days Cucumber 1 days</td>
</tr>
</tbody>
</table>
# Pesticides in Edible Landscapes

- **Pay attention to label!**
  - Directions for application to ornamentals can be very different
  - No pre-harvest intervals

- **Example Label for ornamental plants - spinosad**

<table>
<thead>
<tr>
<th>Outdoor Ornamentals (herbaceous and woody plants)</th>
<th>Gall midges</th>
<th>Sawfly larvae</th>
<th>Leaf feeding beetles</th>
<th>Leafminers</th>
<th>Spider mites</th>
<th>Worms, including Loopers, webworms, Bagworms, gypsy Moth, and tent caterpillars</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mix the amount of concentrated pesticide recommended per pint, quart or gallon of spray and uniformly spray foliage to point of runoff. Uniform coverage of upper and lower leaf surfaces is essential for effective insect control</strong></td>
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</tr>
</tbody>
</table>

- **Drift/Runoff from ornamentals to edibles**
Edible Landscaping

Site Preparation and Maintenance
Fertilizing the Edible Landscape
Fertilizer Management for Edibles vs. Ornamentals

- Edibles often have greater fertilizer need
  - Especially N
  - Special nutrient needs for some crops to produce well

- Edibles often require more frequent fertilization
  - Sidedress N on seasonal crops
  - Annual fertilization of perennial crops

- Consider using slow-release N
Fertilizers and the Edible Landscape: Natural vs. Synthetic Fertilizers

<table>
<thead>
<tr>
<th>Natural Fertilizers</th>
<th>Synthetic Fertilizers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed the microorganism in the soil which break it down for the plants</td>
<td>Provide nutrients immediately available to plants but may not help soil ecosystem</td>
</tr>
<tr>
<td>Nutrient content may not be known for manures and other organics</td>
<td>Precise nutrient content known</td>
</tr>
<tr>
<td>Slow release, hard to damage plants</td>
<td>Can burn plants with too much too fast; can also leach out quickly</td>
</tr>
<tr>
<td>Bulky – uses more resources to ship but derived from renewable resources and can even utilize “waste” products</td>
<td>More compact thus more efficient to ship, but made from non-renewable resources</td>
</tr>
<tr>
<td>Often more costly</td>
<td>Usually less expensive</td>
</tr>
</tbody>
</table>
Conversions of Ammonia to Various Nitrogen Fertilizers

- Ammonia → Ammonium Nitrate
- CaCO₃ → Calcium Nitrate
- Phosphate Rock → Nitric Phosphate
- Phosphate Rock & Phosphoric Acid → Mixed Acid Phosphate
- Ammonia & Sulfuric Acid → Ammonium Nitrate-Sulfate
- Sulfuric Acid → Ammonium Sulfate
- Phosphoric Acid → Ammonium Phosphates
- Carbon Dioxide → Urea
Examples of Synthetic Nitrogen Fertilizers

- Ammonium sulfate (21-0-0-24S)
- Ammonium nitrate (34-0-0)
- Urea (46-0-0)
  - Highest %N; protein substitute in feeds
Animal-Based Natural Fertilizers

- **Animal Products**
  - Blood meal (12-0-0)
  - Bone meal (1-13-0 to 4-12-0, +22% Ca)
  - Feather meal (12-0-0)
  - Fish products (4% to 11% N)

- **Animal Waste Products**
  - Bat guano (3% to 10% N, up to 12% P, 1% K)
  - Manure/compost (1% to 4% N)
Plant-Based Natural Fertilizers

- Alfalfa meal (about 2-1-2)
- Cottonseed meal (about 6-2-1)
- Soybean meal (7-2-1)
- Kelp/seaweed (used for micronutrients, hormones, vitamins, and enzymes)
Mined Natural Fertilizers
Phosphorous

- Phosphorous
  - Soft rock phosphate (16% P and 19% Ca)
  - Natural deposits in N. America, China, Morocco, & former Soviet Union

Potassium

- Various forms
- World reserves deposited when water from ancient inland oceans evaporated
- Canada is the #1 Producer
- U.S. has reserves in New Mexico, Utah
# Nutrient Costs of Selected Fertilizers

Local Nurseries, January 2011

<table>
<thead>
<tr>
<th>Product</th>
<th>Analysis</th>
<th>$/Lb. of N (3-5 lb. bag/box)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHEMICAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azalea/Camellia</td>
<td>4-8-5</td>
<td>$6.46</td>
</tr>
<tr>
<td>Rose</td>
<td>5-10-5</td>
<td>$5.49</td>
</tr>
<tr>
<td>Multi-Purpose</td>
<td>16-16-16</td>
<td>$2.29</td>
</tr>
<tr>
<td>Citrus</td>
<td>12-8-4</td>
<td>$4.58</td>
</tr>
</tbody>
</table>

| **“NATURAL” BRAND** |            |                             |
| Azalea/Camellia     | 4-5-4      | $17.31                      |
| Rose                | 5-7-2      | $16.07                      |
| Multi-Purpose       | 4-4-4      | $18.75                      |
| Citrus              | 7-3-3      | $11.25                      |
## Nutrient Costs of Selected Fertilizers

Local Nursery vs. Peaceful Valley Farm Supply  
(Box vs. Bulk)

<table>
<thead>
<tr>
<th>Product</th>
<th>Analysis</th>
<th>$/Lb. N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NURSERY (3.0 to 3.5 lb.)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa meal</td>
<td>4-8-5</td>
<td>$40.00</td>
</tr>
<tr>
<td>Blood meal</td>
<td>13-0-0</td>
<td>$16.81</td>
</tr>
<tr>
<td>Cottonseed meal</td>
<td>5-2-1</td>
<td>$21.43</td>
</tr>
<tr>
<td>Bat guano (1.5 lb.)</td>
<td>10-3-1</td>
<td>$38.10</td>
</tr>
<tr>
<td><strong>PVFS (50 lb.)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa meal</td>
<td>2.4-0-0</td>
<td>$18.33</td>
</tr>
<tr>
<td>Blood meal</td>
<td>13-0-0</td>
<td>$9.23</td>
</tr>
<tr>
<td>Cottonseed meal</td>
<td>6-2.5-1</td>
<td>$7.37</td>
</tr>
<tr>
<td>Bat guano (25 lb.)</td>
<td>10-6-2</td>
<td>$16.66</td>
</tr>
<tr>
<td><strong>Nutri-Rich</strong></td>
<td>4-3-3</td>
<td>$2.80</td>
</tr>
</tbody>
</table>
Nutri-Rich
Pelleted chicken manure
Thank you!

- Any Questions?
Harvest and Storage of Edible Plants

Rebecca Niec
Master Gardener
UC Cooperative Extension
Why Pay Attention to Harvest?

- Resources go into producing a crop
- Allows harvest to suit personal ripeness and preferences
- Plan to be available to process harvest
General Rules of Harvest

- Each crop has optimum harvest period and method
- Variations are based on:
  - Individual taste preferences
  - Socio-cultural orientation
  - Physiological characteristics of fruit
  - Varietal differences
  - Planned use of crop
- Harvest during cool temperatures
Stages of Ripening

- Fully tree ripe
  - Full maturity and optimal stage for harvest
  - Best for fresh eating and drying
- Firm ripe – better to freeze or can
- Some important quality factors
  - Taste
  - Color
  - Firmness
  - Size
  - Minimal defects
Sanitation and Harvest

- Use only clean, sanitized buckets and bins
- Wash hands prior to harvest
- Wear clean cotton gloves to reduce contaminants on fruit
- Do not stack bins/buckets
Clip - Twist - Layer

- Fruits such as persimmon, pomegranate, quince and grapes require clipping
- Avoid damage to skins of tender fruits by layering with newspaper
- Tomato family can be twisted or clipped
- Squash family
  - Winter squash – best cut above stem
  - OK to twist summer squash
Harvesting Herbs and Veggies

- Clip using sanitized clippers, kitchen shears, knife or fingers
- Cut main broccoli head, then harvest side shoots and leaves for 6 to 8 weeks
- Pinch off basil flowers to prolong leaf production
- Sustain harvest of leafy crops by harvesting outside leaves frequently
Storage and Preservation Considerations
Short-Term and Long-Term

- Large trees/vines can produce several hundred pounds of produce
  - Do you have time to process? Can, dry, ferment, pickle or freeze?
  - Check your available freezer space
  - Air dry (herbs), oven dry, sun dry or use dehydrator (tomatoes, cantalope)
  - Consider short-term refrigerator space before harvesting begins
Key Storage Requirements

Depends on product:

- **Store in refrigerator**: most fruits, vegetables and herbs

- **Ripen on counter, then refrigerate**: primarily stone fruits and avocados

- **Store at room temperature**: many tropicals, basil, some vegetables

- **Most produce will store longest if harvested in the cool AM hours**
### Storing Fresh Fruits and Vegetables for Better Taste

<table>
<thead>
<tr>
<th>Storage Location</th>
<th>Fruits and Melons</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Store in refrigerator</td>
<td>apples—(more than 7 days)</td>
<td>artichokes</td>
</tr>
<tr>
<td></td>
<td>apricots</td>
<td>asparagus</td>
</tr>
<tr>
<td></td>
<td>Asian pears (nashi)</td>
<td>green beans</td>
</tr>
<tr>
<td></td>
<td>blackberries</td>
<td>lima beans</td>
</tr>
<tr>
<td></td>
<td>cherries</td>
<td>beets</td>
</tr>
<tr>
<td></td>
<td>cut fruits</td>
<td>Belgian endive</td>
</tr>
<tr>
<td></td>
<td>figs</td>
<td>broccoli</td>
</tr>
<tr>
<td></td>
<td>grapes</td>
<td>Brussels sprouts</td>
</tr>
<tr>
<td></td>
<td>raspberries</td>
<td>cabbage</td>
</tr>
<tr>
<td></td>
<td>strawberries</td>
<td>carrots</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cauliflower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>celery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cut vegetables</td>
</tr>
<tr>
<td>Ripen on the counter first, then store in the refrigerator</td>
<td>avocados</td>
<td></td>
</tr>
<tr>
<td></td>
<td>kiwifruit</td>
<td>pears</td>
</tr>
<tr>
<td></td>
<td>nectarines</td>
<td>plums</td>
</tr>
<tr>
<td></td>
<td>peaches</td>
<td>plumcots</td>
</tr>
<tr>
<td>Store only at room temperature</td>
<td>apples—(fewer than 7 days)</td>
<td>muskmelons</td>
</tr>
<tr>
<td></td>
<td>bananas</td>
<td>oranges</td>
</tr>
<tr>
<td></td>
<td>grapefruit</td>
<td>papayas</td>
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<tr>
<td></td>
<td>lemons</td>
<td>persimmons</td>
</tr>
<tr>
<td></td>
<td>limes</td>
<td>pineapple</td>
</tr>
<tr>
<td></td>
<td>mandarins</td>
<td>plantain</td>
</tr>
<tr>
<td></td>
<td>mangoes</td>
<td>pomegranates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>watermelons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>basil (in water)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cucumber</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dry onions*</td>
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<tr>
<td></td>
<td></td>
<td>eggplant*</td>
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<tr>
<td></td>
<td></td>
<td>garlic*</td>
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<td></td>
<td></td>
<td>ginger</td>
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<td>jicama</td>
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<td>pepperst</td>
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<td></td>
<td></td>
<td>potatoes*</td>
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<tr>
<td></td>
<td></td>
<td>pumpkins</td>
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<tr>
<td></td>
<td></td>
<td>sweet potatoes*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tomatoes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>winter squashes</td>
</tr>
</tbody>
</table>

* Store garlic, onions, potatoes, and sweet potatoes in a well-ventilated area in the pantry. Protect potatoes from light to avoid greening.
† Cucumbers, eggplant, and peppers can be kept in the refrigerator for 1 to 3 days if they are used soon after removal from the refrigerator.
What about Storing Vegetables?

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Recommended planting dates</th>
<th>General planting requirements</th>
<th>Storage conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>artichoke</td>
<td>Aug–Dec May–Jul Jul Sep</td>
<td>C 3–4 plants 48 (122) 60 (1.5) 32 (0) 1–2 freeze whole, can, dry, or freeze hearts</td>
<td></td>
</tr>
<tr>
<td>asparagus</td>
<td>Jan–Mar Jan–Feb Jan–Feb Feb–Apr</td>
<td>C 30–40 plants 12 (31) 60 (1.5) 32 (0) 3–4 can, dry, or freeze</td>
<td></td>
</tr>
<tr>
<td>beans, lima</td>
<td>May–Jun May–Jun May–Jun —</td>
<td>W 15–25-ft row 6 (15) bush; (4.5–7.5-m row) 30 (0.8) 40 (4) 1–3 can, dry, or freeze</td>
<td></td>
</tr>
<tr>
<td>beans, snap</td>
<td>Jul; May–Jun Mar–Aug Apr–May; Jul–Aug Jan–Mar; Aug</td>
<td>W 15–25-ft row (4.5–7.5-m row) 3 (7.5) bush; 24 (61) pole 30 (0.8) 45–55 (7–13) 1–2 can, dry, or freeze</td>
<td></td>
</tr>
<tr>
<td>beets</td>
<td>Feb–Aug Jan–Sep Feb–Apr; Sep–Jan Aug</td>
<td>C 10–15-ft row (3–4.5-m row) 2 (5) 18 (0.5) 32 (0) 3–10 can, dry, or freeze</td>
<td></td>
</tr>
<tr>
<td>broccoli</td>
<td>Feb–Apr; Jun–Jul; Aug–Sept Jan–Feb</td>
<td>C 6–10-ft row (2–3-m row) 12–18 36 (0.9) 32 (0) 1–2 dry or freeze</td>
<td></td>
</tr>
<tr>
<td>brussels sprouts</td>
<td>Feb–May Jun–Jul — —</td>
<td>C 15–20-ft row (4.5–6-m row) 24 (61) 36 (0.9) 32 (0) 3–4 dry or freeze</td>
<td></td>
</tr>
<tr>
<td>cabbage</td>
<td>Jan–Apr; Aug–Feb Jul; Feb Sep–Nov</td>
<td>C 10–15 plants 24 (61) 36 (0.9) 32 (0) 12–16 dry or freeze</td>
<td></td>
</tr>
<tr>
<td>cabbage, Chinese</td>
<td>Jul–Sep Aug–Oct Aug Aug–Nov</td>
<td>C 10–15-ft row (3–4.5-m row) 6 (15) 30 (0.8) 32 (0) 2–3 dry or freeze</td>
<td></td>
</tr>
</tbody>
</table>
Food Safety
Fruits and vegetables are a very important part of a healthy diet.

Fruits and vegetables can be a source of foodborne illness.

Common sources of foodborne pathogens (microorganisms that cause illness) in produce include:
- Water
- Animals: wild and domestic, including humans
- Soil amendments (especially animal-based)

Preventing contamination is key.
- Evaluate and mitigate risks from pre-plant to harvest of the edible landscape.
Reported outbreaks of foodborne illness linked to FDA-regulated foods by vehicle 1996-2009 (N=532 outbreaks)

- Seafood: 26%
- Egg: 39%
- Sprouts: 5.8%
- Processed foods: 8.1%
- Dairy: 3.9%
- Produce: 16%

Source FDA/CFSAN 2011
Types of produce associated with outbreaks of foodborne illness 1996-2009 (N=87)

- Tomatoes: 17%
- Melons: 16%
- Unknown: 3.4%
- Others: 10%
- Berries: 10%
- Green onions: 3.4%
- Herbs: 6.9%
- Leafy greens: 32%
- Others: 10%
- Unknown: 3.4%

Types of pathogens:
- E. coli O157:H7
- Salmonella spp.
- Listeria
- Hepatitis virus
Good Agricultural Practices

- Focus is on RISK REDUCTION
  - Prevent contamination where possible

- Main sources of foodborne pathogens
  - Water
  - Wildlife and domestic animals, including humans
  - Soil amendments
    - especially those derived from animals
Microbiological Safety of the Edible Landscape

**Planning**
- Site Selection
- Water Source
- Facilities: toilets and handwashing

**Growth (PreHarvest)**
- Water
- Soil Amendments and Supplements
- Animal access

**Harvest**
- Personal Hygiene and Handwashing
- Cleaning and Sanitation

**Post Harvest**
- Washing Produce
- Food Storage and Preservation
Food Safety and Site Selection

- Know the history of the land
  - Risk assessment of prior use
  - Pesticide, cattle, poultry uses

- Consider the neighbors
  - Zoning in surrounding areas
  - Present and future use

- Existing structures/equipment
  - Septic tanks, plumbing access
  - Toilets
Method of Water Application

- Foliar application (spray)
  - Water in contact with edible parts
  - Use water from a safe source
- Soil application (trickle, drip)
  - May lower risk, if properly maintained

Water used to mix solutions or chemicals that contact the edible plant must be potable!
Soil Amendments

- Compost
  - Animal sources (manure)
    - Potential source of high levels of pathogens
    - Properly composted or heat treated
  - Manure from pigs, dogs, and cats must not be used
    - Parasites may remain viable after composting
  - Vegetative matter (no animal manure)

- Green manures
  - Plant matter grown and chopped and incorporated into soil
Un-composted Manure

- Routes of infection
  - Hand to mouth contamination
  - Consumption of contaminated produce
Tools, Equipment and Personal Protective Items

- Keep gloves clean and tools well maintained
- Consider designating tools for specific tasks
  - Chemical use / Compost / Harvest
- Wash and sanitize **harvest tools:** (clippers, knives, scissors)
  - Dishwasher, then lubricate
  - Alcohol wipes (Sani Wipes or other brand)
  - 1T bleach/gallon water, then lubricate
Food Safety and Pesticide Residues
Just before storing or consuming, wash hands, sanitize brushes, work surfaces, cutting boards and knives.

Scrub or rub fruits and vegetables with a brush or hands under running water.

Dry produce with paper towels before storage.

Transfer to a sanitary container.

How to Wash Produce
Long-Term Storage

■ Several methods of home preservation
  ■ Freezing
  ■ Drying
  ■ Fermentation
  ■ Pickling
  ■ Canning
  ■ Jams and Jellies

■ UC home preservation and storage publications
  ■ www.ucfoodssafety.ucdavis.edu
Thank you!

- Any Questions?
Edible Landscaping

Planning & Designing Edible Landscapes

Bill Maynard
Master Gardener
UC Cooperative Extension
Edible Landscapes:
More than a vegetable garden…

Image Source: C. Napawan
Edible Landscape Types:
Balancing productive uses with existing landscape uses

PRIVATE EDIBLE LANDSCAPE - FOOD-PRODUCED PLANTS INTEGRATED WITH PRIVATE LANDSCAPE DESIGN & PROGRAM, INCLUDING INTEGRATION WITH NON-EDIBLE PLANTS. & NON-FOOD RELATED PROGRAM.

EXAMPLE:
EDIBLE RESIDENTIAL LANDSCAPES
EDIBLE CORPORATE CAMPUSES

PUBLIC EDIBLE LANDSCAPE - FOOD-PRODUCED PLANTS INTEGRATED WITH PUBLIC LANDSCAPE DESIGN & PROGRAM, INCLUDING INTEGRATION WITH NON-EDIBLE PLANTS. & NON-FOOD RELATED PROGRAM, UNENCLOSED SPACE.

EXAMPLES:
EDIBLE PUBLIC PARKS
FRUIT & NUT STREET TREES
EDIBLE SCHOOLYARD

Image Source: C. Napawan
Edible Landscape Types

Residential

Institutional

Public

Educational

Image Sources: “Carrot City” by M. Gorgolewski, SWA Group, & C. Napawan
Edible Residence

Edible estates, various locations in US and UK
Fritz Haeg, Artist

Image Source: “Carrot City” by M. Gorgolewski
Southwark, London
Council Housing Garden

Image Source: “Carrot City” by M. Gorgolewski
Edible Rooftop

Gary Comer Youth Center Rooftop, Chicago, IL
Hoerr Schaudt Landscape Architects

8,160 SF

Image Source: “Carrot City” by M. Gorgolewski
Edible Rooftop

Gary Comer Youth Center Rooftop, Chicago, IL
Hoerr Schaudt Landscape Architects

8,160 SF

Image Source: “Carrot City” by M. Gorgolewski
Edible Schoolyard

Sacred Heart School, Atherton, CA
SWA Group, Sausalito, CA

Image Source: SWA Group
Edible Schoolyard

Sacred Heart School, Atherton, CA
SWA Group, Sausalito, CA

Image Source: SWA Group
Edible Schoolyard

Sacred Heart School, Atherton, CA
SWA Group, Sausalito, CA

Image Source: SWA Group
Edible Streetscape

Russell Street olive grove, UC Davis
City of Davis, Davis Olive Center

Approx. 1 Mile

Image Source: Google Earth
Edible Streetscape

Image Source: C. Napawan
Edible Development

Mixed-Use Development, Stockton, CA
SWA Group, Sausalito, CA

137 Acres

Image Source: SWA Group
Assessing Client & Users
Addressing Client & User Conditions

Image Source: www.dwylandscapearchitects.com
Addressing Existing Conditions:
California’s Varied Climates & Growing Regions

Image Source: Adapted from Vossen, 2002
Addressing Existing Site Conditions: 

*Resource Availability*

- **Soil** – Identify if adequate soil exists on-site; confirm safety of soils for edible plants by soil testing, if located in potentially contaminated site; identify appropriate plants for soil type & condition (soil amendments discussed in forthcoming section).

- **Water** – Identify availability of water on-site; confirm average volumes of available water; identify appropriate edible plants for water availability; determine appropriate irrigation method for water availability & desired plants (irrigation techniques & water policies discussed in forthcoming sections).

- **Solar Energy** – Evaluate the site’s cardinal orientation and immediate adjacencies; identify appropriate plants for solar conditions present; for more detailed information on sun/shade studies:

- **Waste Management** – Evaluate sites’ ability to handle green waste through composting; identify
Addressing Existing Site Conditions: Solar Energy


Image source: http://www.idsketching.com/basic/toolbox-shadows/
This single-family residence is located on a cul-de-sac with similar residences surrounding. Homeowners are interested in reducing the amount of lawn throughout the irrigated landscape, and replacing with edible plants. Maintenance of landscape is provided by hired professionals.
Assessing Site, Client & Program

Addressing Existing Conditions
Assessing Site, Client & Program

Developing Alternatives
Designing for What You Want
Using Space to Inform Use, Improve Function and Create a Sense of Place

Image Source: “Form & Fabric in Landscape Architecture” by C. Dee
Designing the Layout

Using Plants to Define Space

Image Source: “Form & Fabric in Landscape Architecture” by C. Dee
Designing a Planting Palette
Reconnecting to Site and Program Assessment

Image Source: “Form & Fabric in Landscape Architecture” by C. Dee
Designing a Planting Palette
Space-Making Through Edible Plants

Image Source: C. Napawan
Space Considerations

Beacon Food Forest, Seattle, WA
Harrison Landscape Architects

7 Acres

Image Source:  http://beaconfoodforest.weebly.com/
Edible Public Park

Beacon Food Forest, Seattle, WA
Harrison Landscape Architects

Image Source: http://beaconfoodforest.weebly.com/
Edible Public Park

Beacon Food Forest, Seattle, WA
Harrison Landscape Architects

Image Source: http://beaconfoodforest.weebly.com/
Edible Landscape Components:
Recognizing Plant Forms and Symbiotic Design Opportunities

Image Source: C. Napawan
Container Planting

Image Source: C. Napawan
Carpets

Image Source: C. Napawan
Walls

Image Source: C. Napawan
Columns and Canopies

Image Source: C. Napawan
Designing for Beauty
A Garden Loved is a Garden that Lasts

Image Source: C. Napawan
Integrating Edibles into Common Areas

Descano Public Demonstration Garden

Image Source: “Carrot City” by M. Gorgolewski
Educational Role
Shaping Space, Informing Use, and Changing Habits

Image Source: C. Napawan
Educational Role

Food can build Community: Davis Farmer’s Market

Image Source: http://ucanr.org/
Thank you!

Any Questions?
Edible Landscaping

Fruit Trees and the Edible Landscape

Patricia Petersen
Master Gardener
UC Cooperative Extension
Fruit Tree Considerations in Edible Landscapes

- Allow enough room to prune, thin, and harvest
- Roots will spread 2 to 3 times the width of the canopy
- Consider effects of sprays on adjacent plants
- Consider clustering fruit trees and keeping them small
  - Similar irrigation, bird netting, mulching, pollination
Low-Maintenance Fruit Species

- Cane berries and blueberries
- Citrus (for now)
- Figs
- Jujubes
- Persimmons
- Plums and pluots
- Pomegranates

Persimmon
Serious Problems with Some Fruit Trees

- Apples and pears – Fire blight, codling moth
- Apricots – Brown rot, bacterial canker
- Cherries – Spotted-wing Drosophila
- Citrus – Asian citrus psyllid, citrus greening, scale insects, frost
- Peach/nectarines – Peach leaf curl
- Grapes – Powdery mildew
Fruit Problems – Solutions Tested

Agribon row cover for spotted-wing Drosophila on cherry

Row cover on branch – Peach leaf curl trial
Peach Leaf Curl Trial
– Individual Branches Treated

Sprayed individual branches

Untreated

Lime sulfur
Results
Control of PLC severity compared to untreated

- Agribon alone: < 60% control
- Liquicop: 70% control
- Copper soap: 80% control
- Nearly complete control:
  - Agribon + Liquicop
  - Lime sulfur / Microcop
Fruit Trees: Aesthetics vs. Production

- Depends on your interests; should be a balance

- Tall vs. short
  - Short trees easier and safer to manage
    - Use genetic dwarf or dwarfing rootstock
  - Tall trees aesthetically pleasing, provide fruit for wildlife too
    - Weight of fruit may bend branches down, may break
    - Pests harder to manage, spraying difficult
    - Fruit drop may become problematic
Standard Trees Often Get Too Tall!

Fruit tree incorporated in landscape, but not well thought out

High branches in tall fruit trees are often unmanaged, and often break
Persimmon Tree in Yard

Before pruning

After pruning
Site Selection

- 6 to 8+ hours of full sun
- Shelter from high winds
- Some trees may benefit from warm south wall
- Avoid planting where fruit falls on walks or driveway
- Soil should be at least 2 to 3 feet deep
A Fenced “Front Yard” Orchard – Productive, but not so attractive
Incorporating Fruit Trees into Designs
Site Selection Issues

Wind protection, full sun, fruit falls on walkway

Some shading, bird netting
Site Selection Issues – Dwarf Peach

Wind protection, warm south wall, blends into landscape

Full sun, a bit out of place but still works
Site Selection Issues – Large Trees, Frost Protection

Front entrance orange tree – too big to cover, fruit falls on walkway

Pomegranates do best with plenty of room
Sculpted Fig Tree in Parterre Garden
Espalier Pruning
Growing Season

Source: Pruning & Training (American Horticultural Society)
Dwarf Citrus Espalier (Mandarin)
Custom Espalier Fence
Fig Espalier
Planting Fruit Trees

- Check roots, cut off dead or damaged
- Hole size: wide, and deep if compacted
- Plant on mound to keep crown dry
- Plant high! – reduces chances of crown and root rot
  - Graft union well above soil
  - Previous soil line at or above soil level
  - Allow for soil settling
Planting a Bare Root Tree

Dig hole to fit roots

Lightly tamp soil

Emitters 1 foot away
Planting a Containerized Tree

- Pull out wound roots
- Don’t cover soil in pot
- Water in
Post-Planting Care

- Head tree at 18 to 36 inches (bare root only)
- Cut back a few well-placed laterals to 3 to 8 inches, remove all others
- Paint trunk white
  - Interior latex paint and water, 50:50
  - Entire trunk plus 2 inches below soil
  - Prevents sunburn and borers
Thank you!

Any Questions?
Edible Landscaping

Citrus and Grapes in the Edible Landscape

Bill Krycia
Master Gardener
UC Cooperative Extension
Edible Landscaping, Citrus!

Citrus

History

Requirements

Care

Selection and use
Edible Landscaping, Citrus!

- History
  - Citrus have been used in landscaping for hundreds of years
  - In California for over 100 years
Edible Landscaping, Citrus!

- Requirements
  - Minimum of 8 hours of sun
  - Appropriate irrigation
  - Good drainage
  - Nitrogen, micronutrients
  - Heat, but not too much
  - Space
Edible Landscaping, Citrus!

- Preferred areas
  - South facing side of house
    - Most sun and warmth
  - West side second warmest
  - Not in a lawn or other incompatible planting
- Cold air drainage
  - Plant preferably not in the lowest spot in the yard
  - Plant upslope on a south facing slope
Edible Landscaping, Citrus!

- Adequate irrigation
  - Check below surface
    - Too much water encourages a host of problems, including phytophthora root rot
  - Mulch

- Drainage
  - Ideally, check before you plant
Edible Landscaping, Citrus!

- Selection
Edible Landscaping, Citrus!

- Taste!
  - Something you like and will use

- Citrus provide
  - Form
  - Full season foliage
  - Color accents
    - Blooms
  - Fruit
Edible Landscaping, Citrus!

- Selection:
  - UC Riverside Citrus Variety Collection website
  - Photos give you an idea of the general tree shape, an idea of what the fruit looks like
Edible Landscaping, Citrus!

- UC ANR Publication 8472: *Tried and True or Something New*, selected citrus varieties for the home gardener.
  - Highlights some of the newer selections of citrus
  - Seedless!
    - Seedless Kishu
    - Tango
    - Gold Nugget
  - Extended season
Edible Landscaping, Citrus!

- **Rootstock**
  - **Dwarf (Flying Dragon, Rich 16-6)**
    - Tree size approximately half of full size
      - 6 to 8 feet for large trees
      - 4 to 6 feet kumquats, smaller citrus
  - **Semi-Dwarf (C-35, trifoliate)**
    - Tree size approximately three quarters of full size
      - 15 feet
  - **Full Size (Carrizo, others)**
    - 20+ feet
Edible Landscaping, Citrus!

- Pruning/shaping
  - Most citrus require little pruning, but…
    - Some mandarins may benefit from a light pruning, reducing the tendency for alternate bearing
    - Lemons seem to enjoy a light pruning
    - Pruning the lower section of the tree will reduce fruit load, watch out for sunburn
  - Espaliers can be done
Edible Landscaping, Citrus!

- Frost Protection/tolerance
  - Certain varieties are more frost sensitive
    - (think either containers or access to power for lights)
Edible Landscaping, Citrus!

- Use
  - Specimen plant
  - Hedge or border
  - Think about what you’re going to do with the fruit
  - Accent
Edible Landscaping, Citrus!

- Container citrus
- Portable
- Containers as accents
- Opens new areas
Edible Landscaping, Citrus!

- In Ground
- Shaping
  - Tree form
    - Skirt or no skirt
  - Shrub form
    - Limequats and kumquats
  - Espalier
    - “Against”
  - Hedge
    - 6 to 9 foot centers on trees
Fruit Tree Considerations in Edible Landscapes

- Allow enough room to prune, thin, and harvest
- Roots will spread 2 to 3 times the width of the canopy
- Consider effects of sprays on adjacent plants
- Consider clustering fruit trees and keeping them small
  - Similar irrigation, bird netting, mulching, pollination
  - Similar frost protection requirements
Fruit Tree Considerations in Edible Landscapes

From Craig Kallsen’s “Growing Citrus in Kern County”:

- Citrus trees are relatively large trees and should be planted at least 12 feet (more is better) from fences, walls and buildings. This rule is good even semi-dwarf citrus (which really can grow into a large tree).

- True dwarf trees on ‘Flying Dragon’ rootstock can be planted 6-8 feet from structures. Trees planted too close to structures will often lean and grow into light, become unbalanced, develop stress cracks in the trunk, and break or fall over.
Serious Problems with Some Fruit Trees

- Citrus – Asian citrus psyllid, citrus greening, scale insects, frost
Distribution of Asian Citrus Psyllid in California

Effectected counties include: Ventura, Los Angeles, San Bernardino, Orange, San Diego, and Imperial.

Updated January 2011
Edible Landscaping, Citrus!

- Questions and Discussion
Edible Landscaping, Grapes!
Edible Landscaping, Grapes!

Grapes

History

Requirements

Care

Selection and use
Edible Landscaping, Grapes!

- History
  - California Missions
- Well established throughout most of the state
Edible Landscaping, Grapes!

- Requirements
  - Adapted to a wide range of soil types
  - Sun
    - 6 to 8 hours a day
  - Irrigation
  - Drainage
  - Support!
  - Care
Low-Maintenance Fruit Species

- Cane berries and blueberries
- Citrus (for now)
- Figs
- Jujubes
- Persimmons
- Plums and pluots
- Pomegranates
Edible Landscaping, Grapes!

- Care
  - Staking/trellising
  - Irrigation
  - Fertilizing
  - Pruning/training
  - Suckering
  - Leaf thinning
  - Cluster thinning/tipping
  - IPM/Spraying/Bird control
Edible Landscaping, Grapes!

- Integrated Pest Management (IPM)
  - Powdery mildew control
  - Bunch rot
  - Grape leaf hoppers
Edible Landscaping, Grapes!

- **Selection**
  - Most grapes are vigorous growers!
  - Most table grapes on own rootstock, most wine grapes on grafted rootstock
- **Taste**
  - Seedless or not?
- **Ripening time**
  - Varieties from mid-July through October
Edible Landscaping, Grapes!

- Use
  - Arbors
  - Trellised along a fence or structure
  - Specimen planting
    - California head pruned
  - Containers

From P Allen Smith online
Edible Landscaping, Grapes!

- Arbors
  - Acceptable for either spur or cane pruning
  - Should be very durable!
  - Consider access for pruning, spraying, etc
Edible Landscaping, Grapes!

- Trellised
  - Support the plant
  - Durable
  - Access
Row 3—Symphony
Symphony is a modern varietal developed at the University of California, Davis in 1948 by crossing Grenache Gris and Muscat of Alexandria. These grapes make an off-dry white table wine and are also used for sparkling wine. See row 1 for a description of the VSP trellis.

Row 4—Viognier (Clone 1)
Viognier is a white varietal originating from the Rhône Valley in France. Difficult to grow, Viognier grapes are prone to mildew, have very low yields and must be picked at the height of ripeness. The result is a wine of heady peach, floral and spice aromas. See row 1 for a description of the VSP trellis.

Row 5—Syrah
Syrah is a red varietal from the Rhône Valley in France. Syrah is also known as Shiraz, the named favored by Australian and some American producers. The grape skins are black when fully ripe. The trellis design is a Smart Dyson system, which separates the canopy vertically. The vine is normally spur pruned, with half the shoots trained upwards and the other half positioned downwards, allowing the fruit to receive more sun exposure and reducing the need to pull leaves.

Row 6—Pinot Noir (Clone 115)
Pinot Noir is the noble, red Burgundy varietal. This grape prefers a cooler climate and is moderately vigorous. The shoots tend to grow in a downward position as the season progresses. Clusters are small in size and cylindrical in shape. Berries are small and blue-black in color.

The trellis design is the Scott Henry system. Similar to the VSP, this design vertically separates the canopy but half the shoots are trained upwards and the other half downwards. The vine is cane pruned, with the upward shoots growing from the top cane while the downward shoots grow from the bottom cane.

Row 7—Merlot (Clone 3)
One of the noble Bordeaux varietals from France, Merlot is a very vigorous vine in fertile soil. The clusters are medium-small and long in shape with reddish-black to black berries.

This row features the Ballerina trellis system, a variant of the Scott Henry trellis in which half the shoots are trained upwards and half downwards. The lower shoots are left to fall naturally, rather than being forced down, providing protection from the sun in areas prone to sunburn.

Row 8—Cabernet Sauvignon
Originally from Bordeaux, this varietal has become world-renowned for producing fine, long-lived red wine. Vine growth is very vigorous in an upright position. The clusters are small and long shaped and the berries are spherical and black in color. This row features the Lyre trellis system, which divides the canopy horizontally with shoots trained to grow vertically upwards, increasing sun exposure and allowing air movement around the fruit.

Row 9—Sauvignon Blanc
Sauvignon Blanc, also originating in Bordeaux, is a very aromatic varietal that makes some of the world’s most popular dry wines. These vines are very vigorous and produce a heavy, dense canopy. The clusters are small, conical and compact with medium-large green berries. This row also features the Lyre system (see row 8 for description), helping to control the vigor and produce a balanced vine without excessive vegetation.

Row 10—Pinot Noir (Clone 115)
This row of Pinot Noir (see row 6 for a description) is grown on the Geneva Double Curtain system. Originally developed at the New York State Agricultural Experiment Station in Geneva, this design requires the plant to grow two trunks and the cordon is trained
Edible Landscaping, Citrus and Grapes

- The spectrum
  - Least complex
    - Lowest labor to maintain (one mandarin tree in a pot)
  - Most complex
    - Intricate, high maintenance (multi-level, multi-zoned interplantings)
- Please remember, it’s all good and worthwhile!
- ...a quick case study:
Edible Landscaping, Grapes!

- Questions and Discussion
- **Formal style: knot garden**
  - Herbs as borders
  - Lettuce and other vegetables
  - High maintenance
Food Can Be Grown in Any Garden

Interplant edibles with your ornamental plants.
Best of both worlds: edible and ornamental

Inter-planting reduces pests

New textures, forms, colors

Grow what you like best

Fun for everyone

Great conversation piece
Incorporating Vegetables into your Landscape...

- Make a list of edibles you like and that grow well in your climate
- Realize that some plants may not be compatible with certain areas or existing plants
- Identify the cultural needs of each
  - Sun vs. shade
  - Soil pH
  - Water requirements
  - Nutrient requirements
- Be aware of overall form
  - Size, shape, color, flowers, fruit
- Identify any pests/diseases that are common
Choosing Varieties That Best Suit Your Needs

- Some plants have varieties/cultivars that are better suited in your landscape
  - Drought tolerance
  - Salt tolerance
  - Disease resistance
  - Pest resistance
  - Striking or more profound colors

http://gurneys.com
Site Selection

- Vegetable crops perform best when well irrigated and receive at least 6 to 8 hours of sunlight

- Vegetables can be used as
  - Ground covers
  - Annual low border bedding plants
  - Visual screens
  - Trellis vines
  - Hanging baskets/containers
Planting Your Edible Landscape

- Seasonal temperatures are very important

  - Warm season crops grow best when average daytime temperatures are between 65°F-95°F

  - Cool season crops grow best when average daytime temperatures are between 55°F-75°F
Planting Your Edible Landscape

- Plants can be direct seeded, transplants, or self seeding

- Use direct seeding for large seeded plants: corn, melons, squash, beans and peas; and for root crops: carrots, radish, beets, turnips, and parsnips

- Use transplants for crops that you want to get an early start by growing them in the house, a cold frame or greenhouse

- Sacramento Vegetable Planting Schedule (EHN 11)
Food Can Be Grown in Any Garden

Interplant edibles with your ornamental
Edible Herbaceous (Non-Woody) Borders

Alpine strawberry  Cucumber (bush or trellis)
Angelica          Edible flowers
Anise hyssop      Eggplant
Artichoke         Endive
Arugula (perennial) Kale
Asparagus         Lavender
Basil             Lemongrass
Beet              Lettuce
Borage            Lovage
Broccoli          Marjoram
Cabbage           Mitsuba
Cantaloupe        Mizuna
Celery            Nasturtium
Chard             Okra
Chives            Orach
Collards          Oregano
Corn              Parsley

Pea
Peanut
Pepper
Poppy (breadseed)
Rhubarb
Rosemary
Safflower
Sage
Scented geranium
Sea kale
Shallot
Squash (summer)
Tarragon
Tomato (determinate)
Many Edibles are Attractive Plants

<table>
<thead>
<tr>
<th>Artichoke</th>
<th>Beets and chard</th>
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<tbody>
<tr>
<td>Kale</td>
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<tr>
<td>Lettuce</td>
<td>Peppers</td>
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<tr>
<td>Mustard</td>
<td>Beans and peas</td>
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<tr>
<td>Rhubarb</td>
<td>Eggplant</td>
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<tr>
<td>Broccoli and cauliflower</td>
<td>Tomatoes</td>
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</tbody>
</table>
Artichoke
Kale
Lettuce
Mustard

Photo by Nancy J. Ondra
Rhubarb

Photo: Rosalind Creasy
Broccoli and Cauliflower
Beets
Beets
Chard
Jerusalem Artichoke
Peppers
Beans
Beans
Peas
Eggplant
Tomato
Tomatoes being trained up garden obelisk

Peas trained on Backyardcreations Garden Obelisk
Photo by Backyardcreationsforyu.com
Edible Ground Covers

Alpine strawberry
Chamomile
Cucumber
Mint (creeping)
Peanut (temporary cover)
Rosemary (trailing)
Sweet potato (temporary)
Sweet woodruff
Thyme
Wintergreen

© Rosalind Creasy
Alpine Strawberry
Chamomile
Thyme
Edible Herbaceous (Non-Woody) Borders
Basil
Basil
Lemongrass
Rosemary
## Edible Flowers

<table>
<thead>
<tr>
<th>Anise hyssop</th>
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<tbody>
<tr>
<td>Apple</td>
<td>Dianthus</td>
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<tr>
<td>Arugula</td>
<td>Dill</td>
<td>Pineapple guava</td>
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<tr>
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<tr>
<td>Bee Balm</td>
<td>Hibiscus</td>
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<td>Borage</td>
<td>Hollyhock</td>
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<tr>
<td>Broccoli</td>
<td>Johnny-jump-up</td>
<td>Sage</td>
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<tr>
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<td>Mint</td>
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<td>Tulip</td>
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<td></td>
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</table>
Borage
Calendula
Lavender
Nasturtium
Squash Blossoms
Viola, Pansy,
Johnny-jump-up, Violet
Daylily
Chives
Corn in the front yard?
Squash

Photo: Rosalind Creasy
Questions
Blueberries, Blackberries and Raspberries

Blueberries

Boysenberries

Raspberries
Blueberries are an excellent low-maintenance crop that fit well into the Edible Landscape.
Blueberry Pollination

Blueberries are self-pollinating but fruit production will improve and berries will be larger if another variety is also planted.
Blueberries in Containers

- Excellent choice for containers
- Adequate watering is critical
- Soil level eventually goes down due to high organic matter
- Dwarf varieties available
Blueberry Plantings

Blueberries will grow in most soil types – provided that the soil is porous and well drained.
Soil Sulfur Needed to Achieve pH 4.5 for Blueberries (tsp./cu. ft. of soil mix)

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<tr>
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<th>Sand</th>
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<td>7.5</td>
<td>11.3</td>
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</table>
Blueberry Blossoms

Blueberries have beautiful pinkish-white clusters of flowers in the early spring.
Harvesting Blueberries

Depending on location and variety, harvest can be in May, June or even July
Caneberries – Blackberries, Boysenberries and Raspberries

- Caneberries are usually planted in the dormant season as bare root plants.

- Blackberries should be planted 3½ to 4 feet apart in rows 8 to 10 feet apart.

- Raspberries should be planted 2½ to 3 feet apart in rows 8 to 10 feet apart.
Caneberries and Trellises

- Blackberries, boysenberries and raspberries benefit from a trellis on which to tie or wrap the canes.
- Blackberries are usually grown on a 3-wire trellis, at 2-, 4- and 6-feet.
- Both the posts and the wires must be strong.
New Canes in Early March

- After summer harvest, old blackberry canes that fruited are cut back to the ground.
- About five to eight new canes are allowed to grow and all other new canes are also cut back to the ground.
- In the winter, the new canes are cut back to 5 to 6 feet long. The side branches (laterals) are cut back to 12” inches.
Raspberries
Typical Raspberry Trellis
New Raspberry Beds at the Fair Oaks Horticulture Center

Cutting 30-inch wide bamboo barrier in half; 15-inch used for beds

Connecting the ends

Four new beds with bamboo barrier; about 2 feet by 3 feet each

Planting a bareroot raspberry after installing 6 inch high wooden frame to protect bamboo barrier
Caneberries
This is NOT how they have to grow

To keep cane berries from getting out of control, they must be properly pruned and trained.
Using Caneberries in the Landscape

Caneberries can form a dense screen
Using Caneberries in the Landscape

Not such a great screen in the winter
Strawberries

- Strawberries come in June-bearing and ever-bearing varieties

- Strawberries make nice groundcovers
  - Need upkeep to maintain productivity
  - Not suitable for walking on

- Alpine strawberries produce smaller fruit but can grow in part shade
Bird Netting Over Blueberries
Edible Landscaping