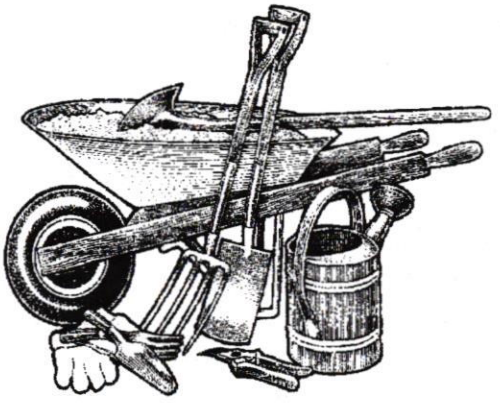
Florida Federation of Garden Clubs, Inc.

"Digging It"

The Florida Horticulture Study Series

(Revised 2018)



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Introduction

Welcome! And thank you for taking the time to enhance your knowledge and skills in horticulture. This project came about as a result of requests from people like you wanting an organized series of horticulture courses, an established horticulture curriculum and a hands-on, interactive opportunity for you to refresh what you already know, hone your gardening skills and maybe even learn something new. But, basically the overall purpose of this program of study is to have fun while learning!

For some students this 10-course series will be an opportunity to learn the basics. You will learn by doing in an informal setting with structured, hands-on workshops. As you become more and more confident in your abilities with these basic skills, it is hoped that you will be encouraged and inspired to enter your horticulture specimens in support of the various sponsored flower shows in your area.

This program can also serve as an introduction and peek your interest in attending NGC sponsored flower show schools and eventually becoming an accredited Flower Show Judge (in much the same way Floral Design Study leads to becoming a designer). But this course goes beyond what you would learn in Flower Show Schools. It goes beyond what you may have learned in the NGC Gardening Study Courses or the NGC Landscape Design Courses. It even augments what you may have learned in becoming a certified Master Gardener. This series of 10 courses will take you step-by-step through the plant world, beginning with botanical nomenclature. Each course focuses on a type of plant giving the specifics of its life cycle and myriad landscape uses. It will provide you with demonstration and practice at propagation. It will help you to select and site the proper plant for the proper place. You will learn how to not only grow the plant optimally but also to show it as an award-winning specimen. You will become acquainted with what it will take to maintain your plant and inform you of the competition you are sure to face from nature's insects, diseases and weather events. This course is designed to be the 'whole package'. And if you don't like the packaged plants we are to study, you can certainly substitute other plants more suited to your area of the state or your interests.

But maybe you don't want the 'whole package'. Maybe 10 courses is too much of a commitment for you. This program is also useful and designed such that any part of it can be developed as a single program for your garden club or organization. Or, maybe you want more, and 10 courses isn't enough for you. This program is also adaptable in the creation and continuation of horticulture study groups in your area. Like-minded 'horti-maniacs' can use the information contained here as a spring board to study specific plants more in depth and establish a cadre of premier horticulturists to serve as flower show classification team members or presenters or teachers. This program is what you make it!

We sincerely hope that you will find this program meets your needs. If not, please let us know and we will strive to revise the materials as necessary to satisfy the pragmatic gardener in all of us. Happy gardening,

Course Guidelines

***Instructor certification process:**
Be recommended by your District Director or an FFGC Executive Board officer.
Be an accredited Flower Show Judge having completed the 4 or 5 course Flower Show Schools series, **or**
Be a Certified Master Gardener with the University of Florida Cooperative Extension completing training and volunteer hours annually, **or**
Provide copies of college transcript indicating a Horticulture or Botany degree earned.
Attend initial instructor training.
Attend annual refresher training (held in conjunction with FFGC board meetings, convention, Short Course) and remain in Good Standing. Training will include hands-on, in depth study, outline distribution, Q and A, etc.
Teach from approved syllabus with approved teaching aids and provide ample samples.
Teach at least once in a three-year time period.
A list of approved instructors will be compiled and maintained by the Florida Horticulture Study Chairman. This list will be sent to any local chairman upon request. The local chairman will choose all instructors independently. There is no limit on the number of times an instructor can be used to teach in the 10-course series.
Instructors will teach from the approved outlines found in this manual. Each Instructor will develop her own method of instruction, however, a unified method of hands-on practice and demonstration will provide students with a better background of knowledge and understanding.
Develop interactive, inspiring specific plant outlines using the recommended format and reference materials. Developed outlines are meant to be shared and personalized.
The Handbook for Flower Shows (current edition) glossary shall be used for definitions of Horticulture terminology.

***Fees**: Instructors will charge a fee of not more than $100 for each 4-hour/ one-day unit (or $25 per hour) plus receive mileage in the amount of 35 cents per mile. The host club shall provide horticulture specimens and materials as needed as well as any hospitality for the instructor.
If a **guest speaker/expert in the field of study** is used, he or she will be offered a stipend of $25 per hour (that amount to be deducted from the primary instructor's fee). Consider inviting a plant society member, the county horticulture extension agent, the local college or university environmental horticulture professor or a nursery owner to instruct one or more aspects of a course.

Field Trips: Optional field trips may help reinforce classroom instruction or replace hands-on application. Identify possible field trip venues in advance such as a botanical garden, a nursery propagation operation or even specialty home gardens so students can see first hand what the coursework covers.

***Forms**:
Contracts available in this manual are to be reproduced and used for each unit.
Instructors should keep records on file of each unit taught.

Evaluations of the unit of instruction are available in this manual and are to be reproduced and used for each unit. Evaluations will be mailed to the Florida Horticulture Study Chairman then forwarded to the instructor.
The Florida Horticulture Study Chairman is named by the current FFGC President and can be found in the BOI.

Course Administration

How to Establish a Horticulture Study Course

Committee Chairman:

Contract instructors to teach (either by course or for all courses in advance). Instructor Contract form letter available on page 49. Consider the use of guest speakers or experts in the field of study to augment instruction.

Register the course with the State Horticulture Study Chairman (name and address can be found in the BOI). Registration forms available on page 55.

Coordinate for an appropriate facility (negotiate rental contract).

Get the word out! **Publicity** is vital to a successful program!

Coordinate with other committee members for set up and clean up.

Committee members:

****Hospitality**: Set up for morning coffee, snacks and make arrangements for homemade or catered luncheon at $5 (estimated) per person. Keep records of expenses and income to provide treasurer.

****Horticulture helpers**: Procure examples of plants being studied and plants to be used in propagation or other demonstration techniques. Procure soil, pots, etc. as needed for propagation or demonstration.

****Registration**: Keep list of students signed up to take each course, provide nametags and folder/handouts.

****Treasurer:** Keep accounting of all funds, prepare budget, and pay all bills in a timely manner.

** **Ways and Means**: Provide items for sale that relate to the course of study (books, plants/bulbs/seed, tools, gloves, etc). Keep record of expenses and income to provide treasurer.

****Instructor Hospitality**: Provide a guest room for instructor in your home or reserve hotel room for instructor.

Time management: Each unit is designed for 4 hours in a one-day session. For courses 2 to 10, the idea is to spend 2 hours on the general topic and then 1 hour apiece on your chosen plants to study. Course 1 spends all 4 hours on the basics. It is planned so that there is a hands-on project at least every hour of each course.

Courses may be taken in any order and at any location. It is recommended that Course 1 be taught first as it contains the requisite knowledge all students should possess for successful completion of the courses.

Courses can be scheduled as suits the participants: One course a week for 10 weeks, once a month for 10 months, every other garden club meeting, etc. However, it works best for you. Just remember that all 10 courses should be completed in a 2-year timeframe.

Courses 1 through 6 must be included for certification but courses 7 to 10 may be substituted with any of the optional courses listed or approved by the state chairman.

A Certificate of Completion will be prepared and presented to students when all 10 courses are completed within a two-year period. A certificate fee of $1 per student shall

be forwarded to the state chairman. Certificates are to be presented at a suitable time and event such as at a district or annual meeting, etc.

Recommended cost per student per course is $20 each. If courses are being used as a fundraiser, consider having a luncheon (extra charge) and ways and means table/plant sales. Plant materials paid for by the committee for use by the instructor can be sold to recoup cost of course.

Establish a minimum and maximum number of students.

The basic Course Handbook is available through the FFGC Headquarters gift shop for a nominal fee (includes notebook binder, outlines, handouts and administrative forms). An Instructors Course Handbook is available through the FFGC Headquarters but is to be purchased by approved instructors only.

Forms included in the binder are also available online at the FFGC web site in the horticulture section.

Forms may be mailed or emailed to the State Horticulture Study Course Chairman (listed in the BOI).

Course Adaptations:

With only minor adjustments, this course can be tailored to serve as a series of programs for your Youth Gardener clubs. Many of the projects found herein can be successfully used with your Garden Therapy programs. The "Digging It" program in its entirety can be used for Penal Therapy as well.

Awards:

There are a number of state and national awards that can be applied for by using this program in your garden club projects. Look in your Book of Information (BOI), Section II, to see what might apply. Community service projects could be the perfect vehicle for putting the recently gained knowledge to good use. Consider the Deep South Region Award #11 Horticulture Award, the FFGC District Award #D-8: District Horticulture Award, FFGC Award #20: Year's Horticulture Programs, FFGC Award #21: Horticulture, FFGC Award #21: Horticultural Achievement, FFGC Award # 26: Membership Increase Through Horticultural Activities, FFGC Award #32: Park Planting, FFGC Award #34: City Public Planting, FFGC Award #36: Community Service Award, FFGC Award #37: School Grounds Beautification, FFGC Award # 42: Landscaping a Balcony Award, FFGC Award # 44: Native Plant Landscaping, and so many others. Take the time to look for an appropriate project that fits with your "Digging It" learning experiences and then apply for the award.

Course I. Horticulture Basics

Objectives for this unit:
1. Accurately define horticulture and explain various classification systems.
2. Accurately name the various plant categories and state the life cycle of a plant.
3. Accurately name the various parts of a flower and state methods of plant propagation.

I. What is horticulture?

A. Binomial System of Classification, Nomenclature: **Linnaeus**
International Code of Botanical Nomenclature: (www.icbn.org)
1. **Family**
2. **Genus**
3. **Species**
4. **Variety**
5. **Cultivar**
6. **Hybrids**
7. **Common Names**

B. Plant categories:
1. **Spore**s
2. **Gymnosperms**
3. **Angiosperms**
   - **a.** Monocotyledons
   - **b.** Dicotyledons

C. Plant types by life cycle:
1. Annuals
2. Biennials
3. Perennials

D. Anatomy
1. **Leaves**: evergreen or deciduous**.**
   - a. Blade and the petiole.
   - b. Leaf shapes
     - 1) Forms
     - 2) Bases
     - 3) Tips
     - 4) Margins
     - 5) Arrangement
     - 6) Leaf **divisions:** simple or compound (pinnate or palmate).
     - 7) Leaf attachments
     - 8) Leaf textures

2. **Flowers**:
   - a. **Peduncle** or **pedicels**

b. Inflorescence regular or irregular symmetry
c. Complete or incomplete
d. Perfect or imperfect
e. Monoecious or dioecious

3. Reproductive organs
   a. Stamens
   b. Filament
   c. Anther
   d. Carpel or Pistil
   e. Stigma
   f. Style
   g. Ovary

4. Accessory parts:
   a. Sepals
   b. Calyx
   c. Petals
   d. Corolla
   e. Bract

5. Roots
   a. Fibrous roots
   b. Tap roots
   c. Tuberous or Fleshy roots
   d. Adventitious roots
   e. Aerial roots
   f. Knees

6. Stems
   a. Xylem
   b. Phloem
   c. Nodes
   d. Specialized stems:
      1) Rhizomes.
      2) Corms
      3) Stem Tubers
      4) True Bulbs
         i. Tunicate
         ii. Scaly

E. Propagation:
   1. **Seeds**
      a. Fleshy Fruits
      b. **Dry** Fruits
         1) Dehiscent

2) Indehiscent

2. Asexual or Vegetative reproduction:
   a. Division
   b. Stem cuttings
   c. Root cuttings
   d. Leaf cuttings
   e. Tissue culture
   f. Layering
   g. Grafting

F. **Soils**:
   1. Sand
   2. Silt
   3. Clay
   4. Humus
   5. Bacteria
   6. Water
   7. Air
   8. Soil pH

G. Fertilizer
   1. Nitrogen (N)
   2. Phosphorous (P)
   3. Potassium or Potash (K)
   4. Trace elements
   5. Slow-release
   6. Liquid

H. Environmental factors
   1. Light
      a. Etoilation
      b. Photoperiodism.
   2. Water/humidity
   3. Temperature
   4. Pests and Disease
      a. Chewing insects
      b. Sucking insects
      c. Animals
      d. Root knot nematodes
      e. Integrated Pest Management (IPM)

How to Write a Scientific Name

When handwritten *(e.g., on an entry tag in a flower show)...*

The **Genus** is written with a **capital letter** and **underlined**, e.g., *Salvia*

The **species** is written with a **lower case letter** and **underlined**, e.g., *farinacea* in *Salvia farinacea*

The **variety** is written with a **lower case letter** and **underlined**, e.g., *koreana* in *Buxus microphylla koreana*

OR with **var.** placed before it and variety name **underlined**, e.g., *Buxus microphylla var. koreana*

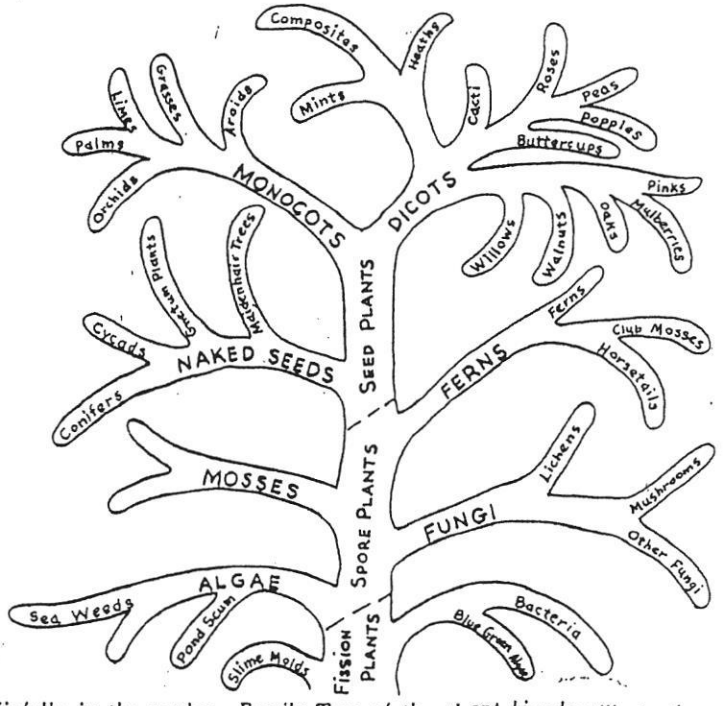
The **'Cultivar'** is enclosed in **single quotes** and **capitalized**, e.g., *'Victoria'* in *Salvia farinacea 'Victoria'*

OR with **cv.** placed before it and the single quotes omitted, e.g., *Salvia farinacea cv. Victoria*

When naming a **'Cultivar' of a variety**, underline **Genus and species**, add **var.** before the **underlined variety** name, and then add the **'Cultivar' in single quotes**, e.g., *Buxus microphylla var. koreana 'Wintergreen'*

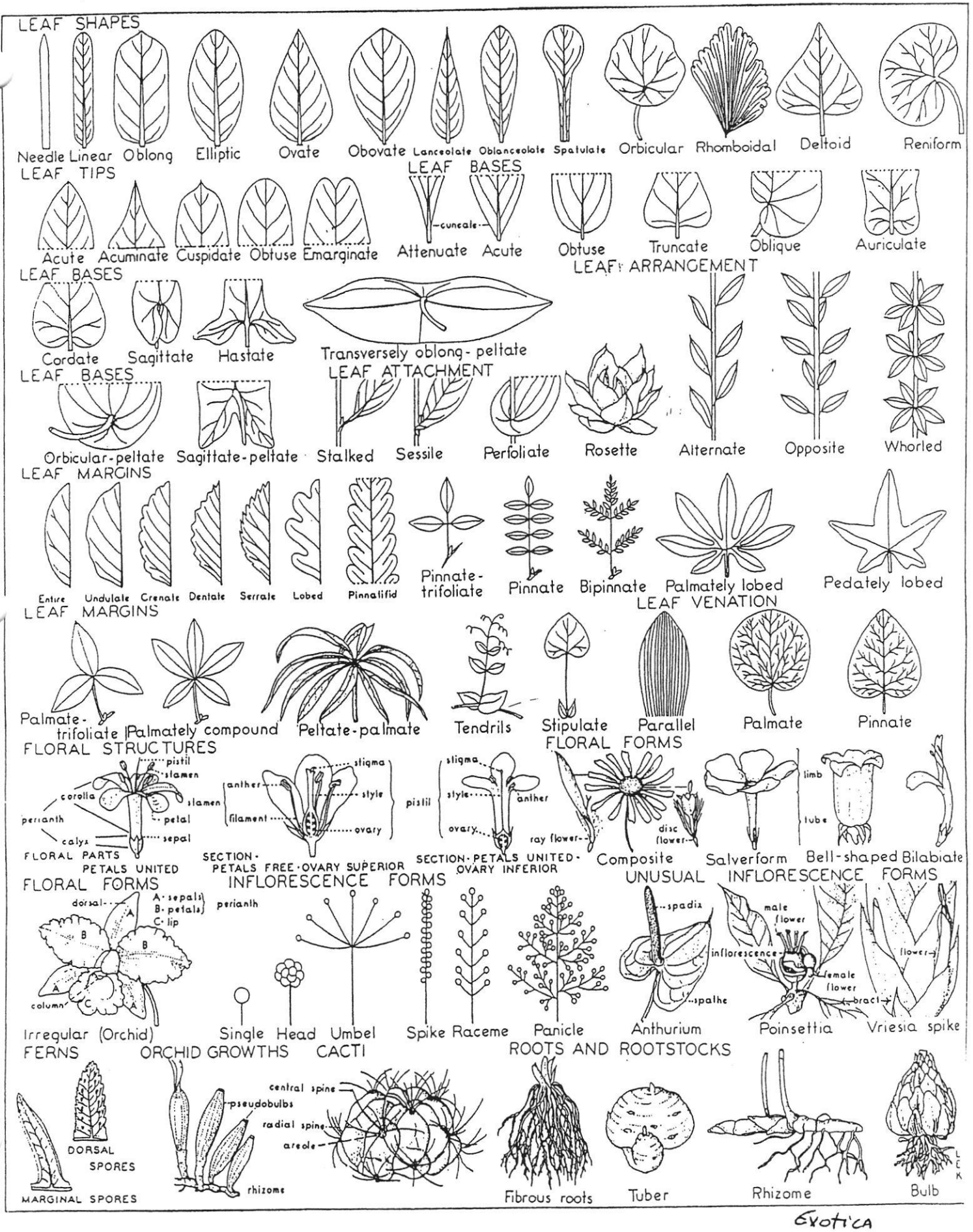
When printed *(e.g., on a computer)...*

Substitute ***italics*** **for the underlining**, e.g., ***Buxus microphylla*** **var.** ***koreana*** **'Wintergreen'**



Kinfolks in the garden. Family Tree of the plant kingdom illustrating plant relationships, by Mrs. Robert Randis, Lake Wales Garden Club.

Descriptive Botanical Terms illustrated



EXOTICA

How to plant your trees

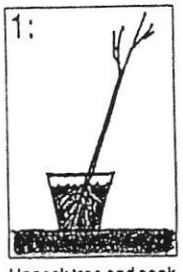
Correct planting procedures will help each tree, shrub or other plant grow to become healthy and vigorous, able to live to the limits of its natural life.

Where to Plant

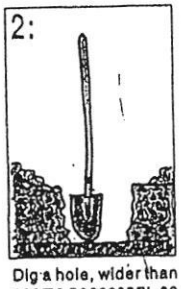
Consider how big your trees will grow. Avoid planting under or near overhead utility lines. If you're planting 6- to 12-inch trees, you may want to start them by planting them a foot apart in your garden. After they have grown for a year or two, you can transplant them to their permanent locations when they are dormant.

Planting Bare-Root Trees

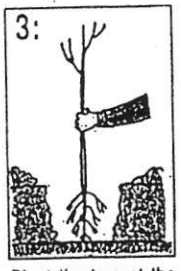
It is best to plant bare-root trees immediately, in order to keep the fragile roots from drying out. If you can't plant because of weather or soil conditions, store the trees in a cool place and keep the roots moist.



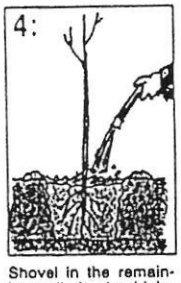
Unpack tree and soak in water 3 to 6 hours. Do not plant with packing material attached to roots and do not allow roots to dry out.



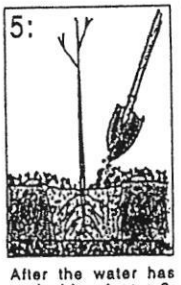
Dig a hole, wider than seems necessary, so the roots can spread without crowding. Remove any grass within a 3-foot circular area. To aid root growth, turn soil in an area up to 3 feet in diameter.



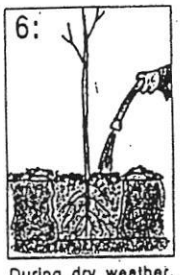
Plant the tree at the same depth it stood in the nursery, without crowding the roots. Partially fill the hole, firming the soil around the lower roots. Do not add soil amendments, such as peat or bark.



Shovel in the remaining soil. It should be firmly but not tightly packed. Construct a water-holding basin around the tree. Give the tree plenty of water.



After the water has soaked in, place a 2-inch deep protective mulch in an area 3 feet in diameter around the base of the tree (but not touching the trunk.)



During dry weather, water the tree generously every week or 10 days during the first year.

Planting Evergreens

Evergreens are planted in the same manner as deciduous trees, and do not need pruning at planting. Partial shade is recommended for the first year except for junipers and cedars. Give them plenty of water and promote growth by cultivating the soil during the first few years. A desired shape can be kept by pinching off new growth in the spring, cutting just ahead of a point where there is a dominant bud.

When You Plant in the Fall

After fall plantings, completely soak the ground around the tree once each week until the ground is frozen solid. Also, water during winter warm spells if the ground is dry and not frozen. Before freezing time, cover the soil around the base of the tree with an extra 4-inch layer of insulating mulch. Remove this extra mulch in the spring after the ground thaws.

Planting a Lot of Tree Seedlings

When planting a large number of small seedlings, the same basic principles apply as in planting bare-root trees. However, use of a planting bar can help speed up the process. Remember to keep roots from drying out before planting, water the trees generously, and use mulch.

Insert a planting bar and work back and forth to create a hole for planting.

Place the tree in the hole at about the same depth it stood in the nursery.

Insert the bar about 2 inches from the hole and work the bar back and forth to pack soil around the roots.

Close new hole with your heel.

The Value of Mulch

A young tree's best friend, mulch insulates soil, retains moisture, keeps out weeds, prevents soil compaction, reduces lawnmower damage, and adds an aesthetic touch to a yard or street. Remove any grass within a 3-foot area and pour organic mulch such as wood chips or bark pieces 2- to 4- inches deep within the circle. Keep the mulch from touching the trunk of the tree.

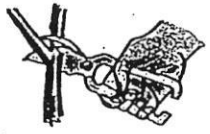
How to prune young shade trees

"As the twig is bent, so is the tree inclined." This insightful saying about education also serves as the cardinal principle for pruning trees. How you prune your tree during its first few years will affect its shape, strength, and life span. Proper pruning will save you money and give you safer, healthier, more beautiful, and easier-to-maintain trees.

Keys to Good Pruning

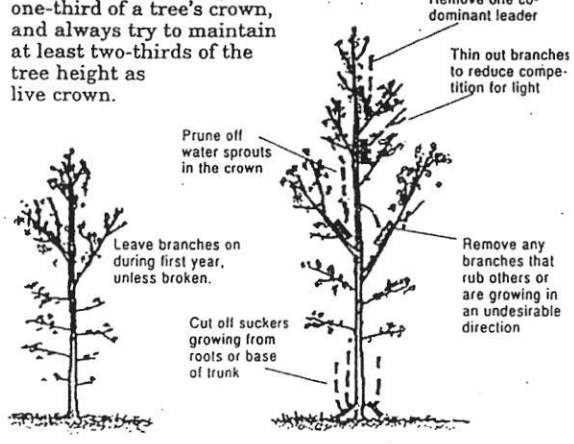
1. Prune early in the tree's life so pruning wounds are small, but do not start until the third year or so. A new transplant needs its leaves to produce for new growth.
2. Identify the best leader and lateral branches before you begin pruning and remove any defective parts before pruning to form. Try to find and use lateral branches that form "10 o'clock" or "2 o'clock" angles with the trunk. Branches with such angles will have greater strength than those with sharper angles.

3. Keep your pruning tools sharp. One hand pruning shears with curved blades work best on young trees.



Prune with an eye to the future

As you prune, remember that the branches do not move up the trunk as the tree grows. A branch 5 feet from the ground now will be 5 feet off the ground in 10 years—only thicker and longer than it is now. Try to visualize what a particular branch will look like later, and remove any branches that will cause an obvious problem. Never remove more than one-third of a tree's crown, and always try to maintain at least two-thirds of the tree height as live crown.

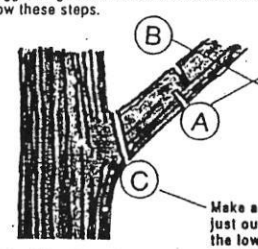


Tree as planted — By age 3–4 years

How to Make a Pruning Cut

Pruning Large Limbs:

Large, heavy limbs could tear loose during pruning, stripping bark and creating jagged edges that invite insects and disease. That won't happen if you follow these steps.



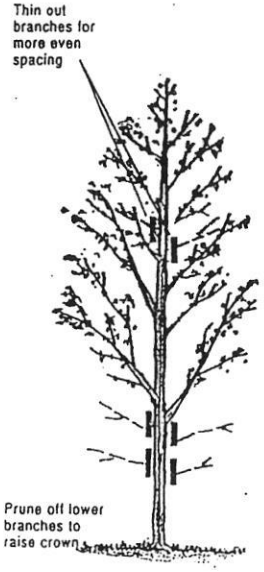
Cut part way through the branch from beneath.

Make a second cut on the top of the branch, several inches out from the first cut. This will allow the limb to fall and be safely removed.

Make a final cut next to the trunk, just outside the branch collar, with the lower edge farther away from the trunk than at the top.

Pruning Smaller Branches:

Smaller branches should be cut just beyond a lateral bud or another small lateral branch. The ideal cut is sharp and clean, and made on a slight angle.

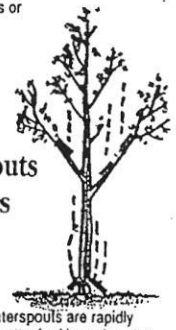


By age 5–7 years

Double Leaders

Select a single leader and protect it from competition. Remove co-dominant leaders that have crooks or other defects.

Waterspouts & Suckers

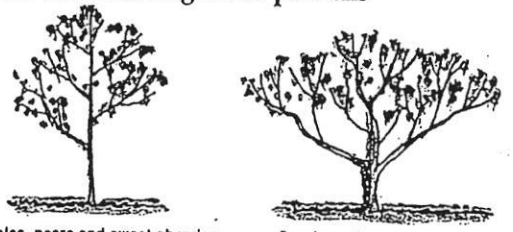


Suckers and waterspouts are rapidly growing, weakly attached branches that can occur at the base or in the crown. Remove them as soon as possible.

How to prune fruit trees

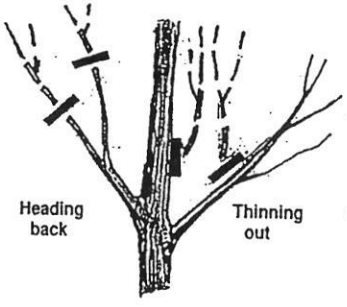
Properly pruning your fruit trees will help insure high quality fruit year after year. Pruning strengthens branching structures, helps prevent limb breakage due to heavy fruit loads, insures that all fruit-bearing limbs receive sunlight, and helps fruit grow at heights for easy harvesting.

Prune for natural growth patterns

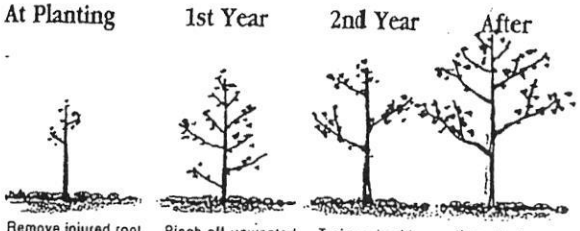


- **Apples, pears and sweet cherries** are generally upright growing trees, and should be pruned to encourage vertical growth and a stronger central or main leader. The top portion of the main trunk is cut out after the tree begins to bear fruit.
- **Peaches, plums, apricots and sour cherries** are more spreading in their growth patterns. They may be pruned into what is called "open center" form, with a short main trunk and several large branches carrying most of the leaves and fruit away from the center of the tree.

Two types of fruit tree pruning



- **Heading Back** means cutting or shortening a branch or shoot, cutting the branch just above a bud. This encourages lateral branching.
- **Thinning Out** removes unwanted or rubbing branches, or those with weak branch angles, by cutting the entire branch or shoot back to a lateral branch or the main trunk.
- **NOTE: Don't prune the short branches known as fruiting spurs. The spurs are the only places where fruit will grow (except for peaches, which fruit on one-year-old wood).**



Remove injured root tissue and branches with narrow crotch angles, that cross or rub, or that are less than 6 inches from other branches.

Pinch off unwanted sprouts in the late spring. Encourage the main trunk to grow upward, with side branches only at wide angles.

Train main side branches to grow outward. Encourage a few upright branches that can serve as "scaffold" branches.

Keep the tree leader dominant, and retain 2 or 3 new lateral branches. Aim for balance between parts of the tree.

Course 2: Annuals and Biennials

Objectives for this unit:
1. Understand the different types of Annuals, how they grow and how to care for them.
2. Determine the uses of annuals and biennials in the garden.
3. Successfully propagate annuals and biennials.

I. Definitions: What is an **annual**?
- **A.** Winter annuals
- B. Summer annuals
- C. Hardy annuals
- D. Half-hardy annuals
- E. Tender annuals
- F. Shade annuals
- G. Sun annuals

II. What is a **Biennial**?

III. Uses in the landscape:

Bedding plants, in **containers,** as **edges or borders,** as temporary **screens**, for **fragrance**, for **cut flowers, to dry, as larval and nectar foods** for butterflies or as **edible foods** such as annual vegetables.

IV. Growing and showing: Cultural Requirements
- A. Choosing a location:
- B. Preparing a location:
  - Direct sow
  - Start indoors
  - 'Hardening Off'
- C. Conditioning
- D. Entering in a Flower Show
  - The Flower Show Schedule
  - Section for the 'Cut flowers for Annuals'
  - Section for 'Biennials'
  - Section for 'Cut Decorative Foliage'
  - Container-grown specimens
  - 'Collection' or 'Display'
- E. What the **judges** are looking for:
  - Plant Identification
  - Cultural perfection: color, form, size/ maturity
  - Condition/blemishes, grooming and staging

V. Propagation:

By seed: The Germination process
- Thinning out

Reseeding
Heirloom seeds www.heirloomseeds.com/catalog.html

By **stem cuttings**

VI. Maintenance:

Pruning, pinching, dead heading
Mulching
Fertilizing
Staking

VII. Pests and Diseases:

Integrated Pest Management:

Course III. Herbaceous Perennials

Objectives for this unit:
1. Define the different types of herbaceous perennials and state how they may be used in the landscape.
2. Discuss proper care of herbaceous perennials and how to successfully propagate them.

I. Definitions: What is an **herbaceous perennial**?

II. Uses:

In **flowerbeds**, in **Containers,** to attract birds, butterflies and other **wildlife**, in **wet areas** or in **dry areas**, or as a temporary **screen**

III. Growing and showing: Cultural requirements

A. Location of the site:
Sun perennials: Full sun or partial sun
Shade perennials
B. Preparing the site
C. When to plant
D. Conditioning
E. Entering in a flower show:
The Flower Show Schedule
Section designated "Flowers from Cut Perennials"
Section for "Cut Decorative Foliage"
Container-grown specimen
Collection or Display
F. What the **judges** are looking for:
Plant Identification
Peak of perfection: color, form, maturity/ size
Condition/blemishes, grooming and staging

IV. Propagation:

By seed
Division and separation
Stem cutting
Root cutting

V. Maintenance:

Fertilizing
Mulch
Pruning, pinching, dead heading.
Staking

VI. Pests and diseases:

Insects

Fungus
Bacteria
Viruses

Check out the Perennial Plant Association web site and plants of the year www.perennialplant.org.

Course IV. Woody Perennials / Arboreal Trees and Shrubs

Objectives for this unit:
1. Define the differences between trees and shrubs and the uses and care of each.
2. Demonstrate the methods for propagating trees and shrubs.

I. Definitions: What does **arboreal** mean?
- Arborescent
- Tree
- Shrub
- Sub-shrub
- Understory trees and shrubs
- Cambium layer
- Deciduous vs. evergreen

II. Uses: As f**oundation** plantings, s**pecimen** or Accent trees in **containers, as windbreaks**, n**oise breaks, as a** h**edge** for privacy or as a **barrier**, for s**hade, or for** f**ood.**

III. Growing and showing:
- A. When to plant
- B. Site selection
- C. Site preparation
- D. Plant selection
  - Shapes or silhouette (**excurrent** and **decurrent)**
  - Textures
  - Foliage color and variegation
- E. **Purchasing the plant**:
  - **Bare rooted**
  - **Ball and burlap**
  - **Container-grown**
- F. **Conditioning**
- G. **Entering** in a Flower Show:
  - The Flower Show Schedule
  - The 'Arboreal' Section eligible for the Arboreal Award
    - Flowering
    - Foliage
    - Coned
    - Fruited or berried
    - Maximum length
- H. What the **judges** are looking for:
  - Plant Identification
  - Cultural perfection: color, form, maturity /size
  - Condition/blemishes, grooming and staging

IV. Propagation:

Seed:
- Stratification (period of cold)
- Scarification (to nick or scratch the seed coating).

Softwood and Hardwood cuttings
Layering:
- Simple layering
- Air layering

Grafting:
- Scion
- Rootstock

Root cuttings

V. Maintenance:
- A. Pruning
  - Heading back
  - Thinning out
  - Rejuvenation or renewal pruning
  - Proper cuts
- B. Fertilizing
- C. Staking
- D. Mulch

VI. **Pests and Diseases**
- Integrated Pest Management

*Check out the National Arbor Day Foundation's web site at www.arborday.org.
Florida Department of Agriculture and Consumer Services, Division of Forestry offers booklets on caring for your trees and shrubs.
To plant a Presidential Tree visit www.americanforests.org.

Course V. Bulbs

Objectives for this unit:
1. Accurately describe the most common bulb types, giving examples of each.
2. Demonstrate and describe the methods of bulb propagation.
3. Discuss the process of bulb selection, site selection and preparation, and tell how to successfully maintain planted bulbs in the garden.

I. Definitions: What are **bulbs**?

A. **True bulbs:**
   Tunicate
   Scaly
B. Stem Tubers
C. Tuberous root
D. Rhizomes
E. Corms
F. Basal plate
G. Scape

Uses in the Landscape: in seasonal borders, as cut flowers, in perennial beds or in rock gardens, in containers or naturalized 'drifts'.

III. Growing and showing: Cultural Requirements

A. Site selection
B. Soil preparation
C. Bulb selection
D. Planting Depth
E. When to plant
F. Conditioning
G. Entering in a flower show:
   The Flower Show Schedule
   Section for 'Flowers from Bulbs, Tubers, Corms and Rhizomes'
   Collection or Display
   Container-grown
H. What the **judges** are looking for:
   Plant Identification/
   Peak of perfection: color, form, maturity size
   Condition/blemishes, grooming and staging

IV. Propagation:

Bulbils
Cormels
Division, separation of the offsets
Bulb cuttings

Seed

Toes

V. Maintenance:
- Storage
- Pruning and deadheading
- Fertilizing
- Mulching

VI. Pests and Diseases:
- Integrated Pest Management
- Animals
- Virus

Course VI. Container-Grown Plants

Objectives for this unit:
1. Describe and discuss the many different types of containers, their use and care.
2. Discuss the issue of compatibility in the selection of plants for containers.
3. Create a container-grown combination planting.

I. Definitions:
- Containers:
  - Double potting
  - Top dressing
- Dish Garden
- Terrarium
- Planter

II. Uses: As **houseplants**, in **greenhouses, outside on the patio or as accent** plants. Containers make convenient **veggie and herb gardens.**

III. Growing and showing: Techniques for success; nothing in excess!
- **A. Plant**
- B. **Potting soil mixtures**
  - **Perlite**
  - **Vermiculite**
  - **Recipes** for home mixed potting soil
  - Soil-less mixes
  - Hydroponics
- C. **Light**
  - Photosynthesis
  - Artificial lights
- D. **Water and humidity**
- E. **Temperature**
- F. **Entering** in a flower show:
  - The Flower Show Schedule
  - Sections devoted to container-grown
  - Collections or Displays
  - Possession
- G. What the **judges** are looking for:
  - Plant Identification and labeling
  - Peak of perfection: color, form, show-worthy size
  - Condition, grooming and staging
  - Creative/Distinctive, overall effect

IV. Maintenance:
- A. **Repotting**
- **B. Fertilization**
- C. **Grooming**: Disbudding and deadheading, pruning

V. Pests and Diseases:

Integrated Pest Management

Insects

Virus, Fungus and Bacteria

Course VII. Vines

Objectives for this unit:
1. Accurately describe the methods vines use to attach themselves to a support structure.
2. Describe how vines can be sited and used effectively in the landscape.
3. Propagate vines and discuss planting and care of mature vines.

I. Definitions: What is a **vine**?
- A. Clinging Vines
- B. Non-Clinging Vines
- C. Tendrils
- D. Twining
- E. Rambling or Clambering

II. Uses: Vertical gardening in the landscape for privacy, shade, color, fragrance, to soften hard architectural areas, or as an accent or focal point, for bird and butterfly gardening or as groundcover**.** Ornamental uses on a pergola, lattice, fence, **a trellis**, an arbor, on brick, masonry, stone or mortar walls, and in containers and as houseplants

III. Growing and Showing:
- A. **Site selection**
- B. **Site preparation**
- C. **Plant selection**
  - Sun or shade,
  - Annual or perennial
  - Evergreen or deciduous
  - Bare-rooted
  - In containers
- D. **Conditioning**
- E. **Entering in a flower show**
  - The Flower Show Schedule
  - Section for Vines
  - Flowering or fruiting cut annual or perennial
  - 'Cut decorative foliage'
  - Collection or Display.
  - Container-grown vines

What the judges are looking for:
- Plant Identification
- Cultural perfection: color, form, maturity/size
- Condition/blemishes, grooming and staging

IV. Propagation:
- **Seed**
- **Cuttings**
- **Simple layering**

V. Maintenance:

Pruning
Fertilizing
Mulching

VI. Pests and Diseases:

Integrated Pest Management

Course VIII. Fruits, Nuts, and Vegetables

Objectives for this unit:
1. Understand the differences and similarities between fruits and vegetables.
2. Describe the care and maintenance needed to successfully produce large crop volume.
3. Demonstrate methods of fruit and vegetable propagation.

I. Definitions: What is a **fruit**?
- Exocarp, pericarp and endocarp
- Dry fruits
  - Indehiscent or dehiscent
- Fleshy fruits:
  - Simple fruits:
    - Berry
    - Drupe
    - Pepo
    - Hesperidium
    - Pyrene
    - Pome
  - Compound fruits:
    - Accessory
    - Aggregate
    - Hip
    - Multiple
    - Syconium

II. **Uses**: In the landscape: As trees, shrubs, groundcovers, in containers and as orchards.

III. Growing and Showing: Cultural Requirements
- A. Plant selection:
  - Chill hours
  - Pollinators
- B. Site selection
- C. Site preparation
- D. Entering the Flower Show:
  - The Flower Show Schedule
  - With or without stem
  - The number required
  - Staging the exhibit
  - Collection or Display
  - Container-grown plants
- E. What the **judges** are looking for:
  - Plant Identification
  - Peak of perfection: color, form, maturity/size
  - Condition/blemishes, grooming and staging

IV. Propagation:

- A. Seed
- B. Grafting
- C. Cuttings:
  - Softwood cuttings
  - Hardwood cuttings
- D. Layering:
  - Simple layering
  - Air layering

V. Maintenance:

- A. Pruning
- B. Fertilizing
- C. Mulching

VI. Pests and Diseases:

Integrated Pest Management

VII. Nuts:

A. Growing and Showing:

- Plant selection
- Site Preparation
- Entering the Flower show:
  - The Flower Show Schedule
  - The number required
  - The staging for the exhibit
- What the **judges** are looking for:
  - Plant Identification
  - Cultural perfection: color, form, substance, size, texture and maturity
  - Condition, grooming and staging
  - Distinction

B. Propagation:

- Seeds
- Grafting

C. Maintenance:

- Mulching
- Pruning

D. Pests and Diseases

- Integrated Pest Management

VII. Vegetables: What is a vegetable?

Cool season
Warm season

A. Uses: In the 'victory' garden, in the landscape, on the farm, in a community garden in raised beds, in containers

B. Growing and showing: Cultural Requirements
- Site Selection:
  - Planting plan
  - Raised beds
  - Hydroponics
- Site Preparation
- Plant selection
- Entering the Flower Show:
  - The Flower Show Schedule
  - With or without stem,
  - The number required
  - The staging
  - Collection or a Display
  - Container-grown specimens
- What the **judges** are looking for:
  - Plant Identification
  - Peak of perfection: color, form, maturity/size
  - Condition/blemishes, grooming and staging

C. Propagation:
- Seed
- Rooting

D. Maintenance:
- Fertilizing
  - Side dressing
  - Organic garden
  - Green manure
- Mulching
- Pruning
- Staking
- Shading

E. Pests and Diseases:
- Integrated Pest Management (IPM)
- Crop rotation
- Spraying

Course IX. Herbs

Objectives for this unit:
1. Describe the many uses of herbs.
2. Propagate herbs by a variety of methods and relate proper care and growing conditions.
3. Outline how herbs can be written into a Flower Show Schedule and how to enter blue ribbon quality exhibits.

I. Definitions: What is an **Herb**?

II. Uses: In the **landscape** specialty culinary **herb or knot garden**, as **groundcover**, rock garden, border, or in your **butterfly garden**, in **containers,** raised beds or planter boxes.
- Medicinal
- Culinary
- Aromatic
- Ornamental/decorative

III. Propagation:
- Seed
- Cuttings
- Simple layering
- Division

IV. Growing and Showing: Cultural Requirements
- Site selection
- Site preparation
  - High pH
  - Soil recipes
- Plant selection
- Conditioning
- **Entering** a flower show
  - Sections for cut blooming Annuals, Biennials, Perennials
  - Cut Decorative Foliage
  - Container-grown plants
  - Collection or Display
  - Arboreal specimens
  - Educational Exhibit
  - Section of Crafts
- What the **judges** are looking for:
  - Plant Identification
  - Peak of perfection: color, form, maturity/size
  - Condition/blemishes, grooming and staging

V. Maintenance:
- Pruning and pinching
- Fertilizing

Organic
Mulching

VI. Pests and Diseases:
Integrated Pest Management
Caterpillars
Companion planting

*Check out The Herb Society of America's web site www.herbsocam.org.

Course X. Cacti and Succulents

Objectives for this unit:
1. Describe similarities and differences between Cacti and Succulents
2. Propagate cacti and succulents by a variety of methods and relate proper care.
3. Outline the way cacti and succulents can be used in the landscape and how they might be entered in a Flower Show.

I. Definitions: "All cacti are succulents but not all succulents are cacti."

Aeroles
Glochids
Cladodes
Caudex
Caudiciform

A. Tribes of Cactus: Family Cactaceae

1. Pereskia
2. Opuntia
3. Cereus
   a. Eight sub-tribes:
      1. Cereanae (column or Torch cactus)
      2. Hyloceranae (night-blooming cactus—climbing cacti)
      3. Echinocereanae (Hedgehogs)
      4. Echinocactaneae (Barrel, Ball or star cactus)
      5. Cactanae (Melon cactus or Turk's cap)
      6. Coryphantanae (Pinchushion cactus and Mammillaria)
      7. Epiphyllanae (Christmas (Zygocactus formerly Schlumbergera) and Orchid Cactus)
      8. Rhipsalidanae (Chain cactus), tree dwelling

B. Succulents

II. Uses: In **containers** or in the **landscape,** in a **rock garden** or specialty garden, as a **security** fence, as **groundcovers** or as **accent** or specimen.

III. Growing and Showing: Cultural Requirements

A. Site selection
B. Site preparation
C. Plant selection
D. Entering a flower show:
   The Flower Show Schedule
   Section for Cacti or Succulents
   Cut Blooming or Decorative Foliage specimens
   Container-grown plants
   Collection or Display
   Arboreal specimens

E. What the **judges** are looking for:
    Plant Identification
    Peak of perfection: color, form, size/ maturity
    Condition/blemishes, grooming and staging

IV. Propagation:
    A. Cuttings:
        Stem cuttings
        Leaf cuttings
    B. Offsets and pups
    C. Seeds
    D. Grafting:
        Flat graft
        Cleft graft
        Stab graft
        Side graft

V. Maintenance:
    A. Repotting
    B. Fertilizing

VI. Pests and Diseases:
    Integrated Pest Management

*Check out the web site for the Cacti and Succulent Society of America www.cssa.org

Optional Courses:

May be substituted for units 7 through 10 (vines, cacti, herbs, fruits) or used as supplements to any of the primary units. (Should not be substituted for first 6 units.)

* Camellia
* Daylilies
*Bromeliads
* Roses
* Begonia
* Orchids
*Aroids
*Ferns
*Gingers
*Citrus
*Ornamental Grasses
*Palms and Cycads
*Variegation in Plants
*Native Plants and Wildflowers
Water Gardening and Plants
Tropical plants
Endangered and Invasive Plants
Conserviscaping and Xeriscaping: Low Care Gardening
Butterfly and Bird Gardening / Gardening for Desirable Wildlife
Youth Gardening in Horticulture
Collecting Horticulture
Making Educational Exhibits in Horticulture

*Outlines for these topics are provided. Others are still under development.

Optional Topic:

Camellias

Objectives:
To note similarities and differences between the many species of camellias and the bloom types available.
To demonstrate the varied propagation techniques used by camellia growers.
To reveal the secrets of growing and showing award winning camellias.

I. Classification:

A. **Flower forms**:
   1. **Single**
   2. **Semi-Double--Rose form**
   3. **Anenome**
   4. **Formal Double** (also known as Complete Double).

B. **Blooming periods**:
   1. **Early** (September to early November
   2. **Early to Midseason** (Early November to Mid December)
   3. **Midseason** (Mid December to Mid February)
   4. **Late** (Mid February to Mid March).

C. **Sizes**:
   1. **Miniature** (2 ½ "or less)
   2. **Small** (2 ½ to 3")
   3. **Medium** (3-4")
   4. **Large** (4-5")
   5. **Very Large** (over 5").

A. Family: *Theaceae*
B. Genus: *Camellia*
C. Species:
   1. *C. japonica:*
   2. *C. sasanqua:*
   3. *C. sinensis (C. thea):* "Tea Camellia"
   4. *C. reticulata:*
   5. Others include:

D. Varieties/Cultivars/Hybrids:
   Hardy hybrids:
   April Series of Hardy Camellias:

II. Cultivation/Site selection/Transplanting:
   A. Light (exposure): partial shade
   B. Water:
   C. Humidity:
   D. Temperature:
      1. Greenhouse grown:
      2. Container grown:

E. Soil:
F. Fertilizer:

III. Maintenance:
- A. Pruning:
- B. Disbudding:
- C. Mulching:
- D. Gibbing:
- E. Spraying:

IV. Propagation:
- A. Seed:
- B. Grafting:
- C. Cuttings:
- D. Air Layering:

V. Pests and Diseases:
- A. Dieback:
- B. Root Rot:
- C. Camellia Flower Blight:
- D. Other diseases:
- E. Insects:
  1. Tea Scale:
  2. Camellia Scale:
  3. Peony Scale:
  4. Wax Scale:
  5. Aphids or Plant Lice:
  6. Mites:
  7. Camellia Bud Mites:

VI. Entering and the Schedule: A Standard Flower Show
- A. **Section** for "Camellia".
- B. Section entitled "Cut Flowers from Perennials", in a **class** for "Camellia".
- C. **Arboreal Section** in the Class for Flowering shrubs
- D. As a container-grown plant.
- E. Collections
- F. Displays/ Club Competition

VII. What the Judges are looking for:
- A. Plant Identification:
- B. Peak of Perfection: color, form, size/maturity
- C. Condition/blemishes, Grooming/Staging:

Optional topic:

Daylilies

Objectives:
To compare the similarities and differences between the types of daylily blooms.
To practice propagation techniques.
To learn the secrets of growing and showing daylilies.

Classification:

Herbaceous perennial, monocotolydon
evergreen (EV)
semi-evergreen (SEV)
deciduous (DOR=dormant)
Bloom times:
EE very early
E early
EM early mid-season
M mid-season
ML later mid-season
L late
VL very late
Rebloomers (RE)

Family: *Hemerocallidaceae*
Genus: *Hemerocallis:*
Nocturnal
Diurnal
Species:
H. fulva is the common orange daylily
H. flava is the common yellow daylily.
Cultivars: more than 50,000 named selections
AHS Award of Merit or Stout Medal Winners
Ploidity:
Diploid
Tetraploid

Daylily Culture:

Sun: full sun to part shade.
Soil:
Water/Humidity:
Temperature:
Fertilizer:

Propagation:

Separation (Division) of the clump:
Seeds:

Proliferations:

Pests and diseases:

Daylily Rust (*Puccinia hemerocallidis*):
Root rot *(Rhizoctonia)*:
Thrips:
Slugs:
Aphids:
Deer and Armadillo:

Sizes include four categories:

1. Extra Large: 7 " or more in diameter
2. Large: 4 ½" or more but less than 7" in diameter
3. Small: 3" or more but less than 4 ½" in diameter
4. Miniature: less than 3" in diameter

Forms include five categories:

1. **Single**:
2. **Double**:
3. **Spider**:
4. **Unusual Form:**
    a. **Crispate**:
        1). Pinched
        2). Twisted:
        3). Quilled:
    b. **Cascading**:
    c. **Spatulate**:
5. **Polytepal**:

Subforms:

1. **Circular**:
2. **Triangular**:
3. **Star:**
4. **Flat** (or saucer-like):
5. **Recurved**:
6. **Trumpet**:
7. **Informal**:

Colors and Patterns:

1. **Selfs**: Monochrome.
2. **Blends**:
3. **Polychromes**:
4. **Bitones**:
5. **Reverse Bitone**:
6. **Bicolors**:
7. **Reverse Bicolor**:
8. **Eyes and Bands**:
9. **Halo**:

10. **Watermark**:
11. **Contrasting edges**:
12. **Contrasting tips**:
13. **Dots, dusting**:
14. **Contrasting midribs**:
15. **Diamond dusting**:

Textures:

1. smooth
2. velvety
3. creped
4. Ribbed

Substance:

1. Delicate
2. Heavy
3. Leathery

Scape Height (stature):

1. Low: 6" to 24"
2. Medium: 24' to 36"
3. Tall: over 36"—some as tall as 6 feet!
4. Dwarf: Under 12

Branching:

1. Top branched:
2. Well branched:
3. Low branching:
4. Multiple:
5. "Three Way", "Four Way" etc.:

Foliage:

Roots:

The American Hemerocallis Society www.daylilies.org

Some daylily hybridizers in Florida include:
Art Gallery Gardens, 203 Oakapple Trail, Lake Helen 32744
Dragon's Mead Daylilys, 9431 N. Holland Rd, Panama City 32409
Sample Gardens, 3603 Lightner Dr., Tampa 33629 (This is also an AHS Display Garden)
Frank Smith Daylilies, 2815 W. Ponkan Rd., Apopka 32712
Ladybug Daylilies
Floyd Cove Nursery, Enterprise, 32725
Kennibrew 'Spacecoast' Daylilies
Johnson Daylily Garden, 70 Lark Ave., Brooksville, 34601

Optional Topic:

Bromeliads

Objectives:
To learn the similarities and differences between the different types of bromeliads
To practice propagating bromeliads
To learn the secrets of growing and showing bromeliads.

Classification:

Monocotyledon
Monocarpic
Terrestrial
Epiphyte
Inflorescence
Bracts
Scurf

Family: ***Bromeliaceae***

Sub Families: Classified according to manner of growth.

Pitcairnioideae:

Dyckia:
Puya:
Hechtia:

Tillandsioideae: Largest subfamily.

Guzmania: (guz-may-nya)
Tillandsia: (till-and-seeuh)
Vriesea: (vree-see-uh)

Bromelioideae:

Achemea: (Ahk-mee-uh)
Ananas: Pineapples.
Billbergia: (bil-berg-ee-a)
Cryptanthus: (krip-tanth-us)
Neoreglia: (Nee-or-ree-jeel-ya)
Nidularium: (need-ew-lah-ree-um).
Orthophytum:
Portea:

Genus: Over 50 genera.
Species: 2,700 species available.
Variety and Cultivar: There are thousands of hybrids available.

Environmental Considerations:

Light:
Soil:
Water and Humidity:
Temperature:
Fertilizer:

Propagation:

Division of Pups, offsets, offshoots:
Seed:
Pineapples:

Maintenance:

Mounting.
Grooming:
Repotting:
To initiate blooms:

Pests and Diseases:

Scale:
Red Spider mites, Mealy Bugs:
Weevils:
Root Rot:

Entering and What the Judges are looking for:

Entered as container-grown foliage plant or entered mounted, hanging, as on driftwood. May be entered as container-grown flowering plant.

Plant identification:
Peak of Perfection: color, form, size/maturity
Condition/blemishes, Grooming/ Staging:

Optional Topic:

Roses and the *Rosaceae* Family

Objectives:
To explore the similarities and differences between members of the *Rosaceae* family.
To practice rose propagation techniques.
To learn the secrets of growing and showing award winning roses.

Classification:
- Flower forms:
  - Single:
  - Semi-double
  - Double
  - Very double

Family: *Rosaceae*
Genus: *Rosa*
Species:
- Species Roses:
- Antique/Old Garden Roses: those introduced before 1867.
  - Albas, Centifolias, Damasks, Gallicas, the Moss Rose and China roses, Portland, Bourbons, Tea, Noisettes and hybrid perpetual.
- Hybrid Tea:
- Polyantha:
- Floribunda:
- Grandiflora:
- David Austen English Roses:
- Miniature:
- Climbing/Trailing:
- Rambling:

Variety/Cultivar: over 10,000 varieties

Cultivation:
A. Soil:
B. Light:
C. Water and humidity:
D. Temperature:
E. Fertilizer:
F. Air Circulation:

Maintenance:
- Mulching:
- Pruning:
- Disbudding:
- Repotting container-grown plants

Propagation:
- Stem cuttings:

Grafting or budding:
Layering:
Seeds:

Diseases and Pests:
Black Spot:
Powdery Mildew and rust:
Aphids, thrips, white flies, spider mites:
Grasshoppers, katydids, chewing insects:
Borers:

Entering and What the Judges are looking for:
In a Section for Roses
In a Class in the cut flower/ blooming perennial shrubs/ Arboreal Section.
As container-grown plants:
As Collection or Display:

Some other plants in the *Rosaceae* family
Neviusia alabamenis "Alabama Snow-Wreath"
Malus spp. Apples:
Blackberry:
Cherries:
Raspberry:
Eriobotrya japonica: "Loquat"
Kerria japonica: "Japanese Kerria"
Photinia x fraseri: "Redtip"
Physocarpus opulifolius, "Common Ninebark"
Pyracantha coccinea: "Scarlet Firethorn
Prunus spp.:
"Carolina Cherry Laurel": *Prunus caroliniana*
"Cherry Laurel" *Prunus laurocerasus*
Taiwan Flowering Cherry: *Prunus campanulata*
Flowering Peach: *Prunus persica*
Nectarine: *Prunus persica nucipersica*
Flowering Cherry Plum: *Prunus cerasifera*
"Chickasaw Plum" *P. angustifolia*
Dwarf Flowering Almond: *P. glandulosa*
Japanese Flowering Apricot: *P. mume*
Pyras communis:
Pyras calleryana: "Callery Pear"
Chaenomeles: "Flowering Quince"
Raphiolepis spp.:
Rhodotypos scandens "Black Jetbead"
Sanguisorba spp. "Burnet" syn. *Poterium*:
Spiraea spp.:
Sorbaria spp. "False Spiraea"

Sorbus americana "Mountain Ash":
Fragaria x ananassa Strawberries:

Optional Topic:

Begonia

Objectives:
To learn the differences and similarities between the many types of begonias.
To practice begonia propagation techniques.
To learn the secrets of growing and showing award winning begonias.

Classification: Monoecious.
Annuals or tender perennials

Family: ***Begoniaceae***:
Genus: ***Begonia***:
Fibrous-rooted forms:
Wax begonias or ***Begonia semperflorens***:
Tuberous forms:
Rhizomatous forms
Begonia rex-cultorum hybrids
Begonia masoniana --**iron cross-**
Beefsteak Begonias (*B. erythrophylla*)
Eyelash *(B. boweri*)
Lettuceleaf begonias ('Bunchii')
star begonia (*B. heracleifolia)*
spiral or corkscrew begonias
Cane-like stem types: also known as **angel-wing** or flowering begonias.
Trailing or scandent:
Species: Over 1500 known species.
Elatior types
Reiger (aka Hiemalis)
Varieties and Cultivars: Estimated to be 10,000 cultivars.

Cultivation:
Light.
Water and Humidity:
Temperature:
Soil:
Fertilizer:

Maintenance:
Repot
Lift tubers

Propagation:
Vegetative division:
Stem cuttings:
Seed:
Leaf cuttings:
Layering:

Diseases and Pests:

Scale, Aphids and red spider mites or mealybugs
Powdery mildew fungus

Entering and What the Judges are looking for:

As a hanging basket
As a container-grown foliage plant
As cut decorative foliage
As a Collection or Display
As part of a Combination Planting
Identification:
Peak of perfection: color, form, size/maturity
Condition/blemishes, grooming/staging:

Optional Topic:

Orchids

Objectives:
To observe the similarities and differences among this vast family of plants.
To practice propagation techniques.
To learn the secrets of growing and showing award winning orchids.

Defintions:

Labellum or lip
Pollinia.
Epiphytes
Lithophytes
Terrestrials
Saprophytes
semiaquatics
orchis
Monopodial:
Sympodial:
Pseudobulbs:
Velamen:
"Blind" growth:
"Freaks":

Family: *Orchidaceae* All are perennial monocotyledons.
Genus: 500-600 genera, of which about 25 are of practical value.
Species: 35,000 species. **Varieties**: 50,000+ varieties in the world.
Hybrids: Grex, 1,000,000—denoted by pollen parent x seed parent.
Native Orchids:
Botanical Orchids:

Vandas:

Phalaenopsis ("Moth or Butterfly" orchids)

Cymbidiums:

Dendrobiums:

Cypripediums ("Lady Slippers")

Paphiopedilums: (Also called "Lady Slippers" because of its pouch-shaped lip)

Oncidiums: ("Dancing ladies/dolls")

Miltonias: ("Pansy Orchids")

Brassias: ("Spider Orchids" because the sepals and petals of their star-shaped blooms are extremely long and thin—some exceeding 10".)

Epidendrums: (Poor Man's Orchid)

Cattleya:
Uni-foliate or labiates
Bi-foliate

Calanthes:

Bletia/*Bletilla striata* ("Chinese Ground Orchids"):

Phaius tankervilliae ("Nun's Orchids"):

Vanilla: *Vanilla planifolia*:

Macodes/Ludisia: ("Jewel Orchid")

And others:

Uses:
In a greenhouse/glasshouse:
In the home:
Outdoors in tropical climates:
In a terrarium:

Growing and Showing:
Potting materials:
Containers:
Temperatures:
Warm: over 65 degrees: Phalaenopsis and Vanda
Intermediate: 60-65 degrees: Cattleya, Epidendrum, Oncidium and Dendrobium
Cool: 60 degrees or less: Odontoglossums
Humidity:
Watering:
Air circulation/ventilation:
Fertilization:

Propagation:
Division:
Seed:
Meristem cloning: Micropropagation and tissue culture
Keiki:

Maintenance:

Repotting:
Cleanliness:
Staking

Pests and Diseases:

Environmental diseases:
Pathogenic diseases: Fungus, bacteria and viruses
Insect Diseases:

Entering Orchids in the Flower Show:

In classes designated for cut flower or spray of a perennial
As blooming container-grown plants (including mounted on a board)
As a collection
As a display/club competition

What the judges are looking for:

NGC Judges: Only the cultural perfection of bloom is considered, not the foliage!
The American Orchid Society Judges:

Optional Topic

Aroids

Objectives:
To note similarities and differences between the many species of Aroids and the spathe and spadix type bloom.
To demonstrate the propagation techniques used by Aroid growers.
To reveal the secrets of growing and showing award winning Aroids.

Definitions:

Cataphylls:
Spathe:
Spadix:

Classification: perennial shrub, vine, monocot, monoecious and dioecious.
Family: *Araceae* (Arum)—
Genus: 115 genera and 1500 species.

Philodendrons: Vining/climbing and self-heading/upright:
P. selloum (saddle leaf, finger and palm-like),
P. domesticum (spade leaf)

Cultivars: Philodendron x 'Xanadu':
Monstera deliciosa syn *P. pertusum* ("Mexican Breadfruit", "Swiss Cheese Plant", "Split leaf" or cut leaf philodendron).

Spathiphyllums ("Peace Lily", "White Sails")

Anthuriums: ("Tail Flower")
A. scherzerianum is the "Flamingo Flower".
A. andraeanum

Alocasias: ("Taro")
A. wavriniana
A. macrorhiza ("Giant Taro"),
A. cadierei,
A chantrieri,
A watsoniana
A amazonica ("African Mask"),
A. sanderiana.

Colocasias ("Elephant Ears")
C. esculenta is most common.

Dieffenbachia ("Dumb Cane")
D. seguine is the most common.
D. exotica
D. picta

Aglaonemas: ("Chinese Evergreen")
A. modestum is hardiest, solid green.
A. communtatum

Epipremnums: (syn Scindapus, syn Pothos, "Devil's Ivy")
Epipremnum aureum

Caladiums:

C. bicolor.

Nepthytis (syn Syngonium): "Arrowhead vine"

S. podophyllum

Zantedeschia ("Calla Lily"= Arum)

Z. aethiopica (common calla)

Z. albo-maculata (spotted calla)

Z. elliottiana (Golden calla)

Z. rehmanii (pink calla)

Z. melanoleuca (black-throated calla)

Amorphophallus ("Voodoo Lily")

Others:

A**risaemas** ("Jack-in-the-pulpit")

Orontium ("Golden Club")

Symlocarpus *foetida* (Skunk/Swamp Cabbage)

Pistia ("Water Lettuce"—matt forming)

Typhonium

Zamiculca,

Dracontium

Environmental Factors:

Light:

Water and Humidity:

Soil:

Fertilizer:

Temperature:

Propagation:

Cuttings:

Division:

Air Layering:

Seed:

Maintenance:

Repotting:

Support:

Practice cleanliness:

Pest Management:

Spider mites:

Root rot (a fungus):

Mealy bugs:

Entering and What the Judges are looking for:

As cut flowers

As cut decorative foliage

As container-grown plants, flowering or foliage
As a Collection or Display, cut or container-grown

Plant Identification:
Cultural Perfection:
Condition/ Grooming/ Staging:
Distinction: degree of superiority in all listed qualities.

Optional Topic

Ferns

Objectives:
To observe the similarities and differences among this vast family of plants.
To practice propagation techniques.
To learn the secrets of growing and showing award winning ferns.

I. Classification: Categorized by growth habit, frond form, indusium shape and the location and structure of the **sporangia** (spore cases which form on underside of fronds). Terrestrial ferns are Mesophytes that grow in moist, shaded tropical and temperate forests. Epiphytes grow on the trunks of trees and in rock crevices. Xerophytes grow in deserts where they may remain dormant for long periods of time (resurrection ferns). Aquatic ferns grow floating or submerged in water.

A. Family: Pteridophyta includes ferns and fern allies (formerly Filices)..

B. Genus: Numerous genera.

1. *Adiantaceae* are the **Maidenhair** ferns (*Adiantum*).
2. **Bird's Nest** ferns (*Asplenium nidus*) are in the *Aspleniaceae* family. Sometimes referred to as "Spleenwort".
3. *Davalliaceae* are the Rabbit's or hare's foot (*Davallia canariensis*), squirrel's foot ferns *(Davallia mariesii).* These are the **Polypodium** ferns and feature a thick rhizome that creeps over the edge of the container.
4. *Nephrolepis exaltata* are the sword ferns including all **Boston** type ferns.
5. Clumping ferns, *Polypodiaceae,* such as the **Staghorn** fern (*Platycerium bifurcatum).*
6. . *Pteris cretica* is the 'Ribbon or 'Brake' fern. Sometimes called **Table** ferns.
7. *Pellaea rotundifolia* or 'Button Fern'.
8. Others: *Dicksoniaceae*, *Marattiaceae* and *Cyathaeaceae* are the majority of the tree ferns (New Zealand Tree Fern). Holly and Fishtail ferns are in the *Dyopteridaceae* family—*Arachnoides simplicor variegata* is the East Indian Holly Fern, *Cyrtominum falcatum* is the Holly fern. *Ophioglossaceae*-produce only one or two fronds a year—deciduous. *Osmundaceae* with fertile and non-fertile fronds such as Cinnamon fern (*Osmunda cinnamonea*) and Royal fern (*Osmunda regalis*). *Schizaceae* such as Japanese Climbing ferns (*Lygodium japonicum*). Wood ferns, such as the resurrection fern, and the Japanese painted ferns are in the *Woodsiaceae* family. *Woodwardia* species are the Chain ferns (Netted chain and Virginia chain). The Leatherleaf fern, *Rumohra adiantiformi,*.
9. The aquatic ferns are in the *Salviniaceae* family.
10. Fern Allies: include the *Equisetaceae* or horsetails. *Psilotaceae* are the simplest form of a plant with many undifferentiated cells. *Selaginellaceae* are the Peacock ferns.
11. The Japanese Painted Fern, *Athyrium niponicum* 'Pictum', is in the group referred to as Lady ferns.

C. Species: Over 12,000 species with 80 foot tall trees to tiny moss-like specimen.
D. Varieties and Cultivars:

II. Cultivation: Ferns consist of the roots, the rhizome, tightly coiled fiddleheads or croziers (new fronds), the frond and pinnae. The stipe is the petiole equivalent of a frond or leaf. The costa is the major vein.

A. Light:
B. Water:
C. Temperature:
D. Soil:

III. Maintenance:

A. Repot:
B. Fertilize:
C. Transplant:
D. Mulch:

IV. Propagation:

A. Spores:
B. Vegetative division:
C. Offsets:

V. Diseases and Pests:

A. Scale:
B. Fungus:
C. Mealy bugs:
D. Snails and slugs:

VI. What the Judges are looking for:

A. Cultural perfection:
B. Symmetry:
C. Form and color:
D. Clean and well-groomed:
E. Proportion of plant to container:

Optional Topic:

Gingers

Objectives:

To observe the similarities and differences among this vast family of plants.
To practice propagation techniques.
To learn the secrets of growing and showing award winning gingers.

I. **Classification**: An herbaceous, tropical, rhizomatous plant

A. Family: Zingiberaceae
B. Genus- Nearly 50 genera.
1. Alpinia- shell gingers (*Alpinia formosana*
2. Costus- Spiral ginger (*Costus spicatus, Costus barbatus,Costus speciosus*)
3. Curcuma- (*Curcuma ornata, Curcuma elata*).
4. Globba-dancing lady gingers. (*Globba winitii, Globba globulifera*)
5. Hedychium- Butterfly Gingers. (*Hedychium coronarium, Hedychium coccineum).*
6. Kaempferia-Asian crocus. (*Kaempferia gilbertii*)
7. Zingiber—Cone gingers. (*Zingiber zerumbet, Zingiber officinale*)
C. Species:
D. Varieties and cultivars:

II. **Cultivation**:

A. Soil:
B. Light:
C. Water:
D. Temperature:
E. Fertilizing:

III. **Maintenance**:

A. Dividing:
B. Deadheading:

IV. **Propagation:**

A. Division and separation:
B. Stem cuttings:
C. Bulbils:
D. Seed:

V. **Diseases and Pests**:

A. Mites:
B. Nematodes:
C. Mushroom root rot:

VI. **What the Judges are Looking For**:

A. Flower and colorful bracts:

B. As potted plant:

C. As an herb:

Optional Topic:

Citrus

Objectives:

To observe the similarities and differences among this family of plants.
To practice propagation techniques.
To learn the secrets of growing and showing award winning citrus fruits.

I. Classification:

A. Family: Rutaceae (Rue)
B. Orange subfamily: Auranthioideae:
C. Tribe Citreae
1. 3 sub- tribes:
a. Primitive Citrus
b. Near Citrus Fruit trees
c. True citrus fruit trees (Citrus, Poncirus, Fortunella /Kumquat)
2. Hesperidium fruits:
a. mesocarp
b. exocarp
D. Genus:
1. ***Poncirus trifoliata***. "Flying Dragon
2. Fortunella or **Kumquat** "Golden Orange"
3. Citrus: **Sweet oranges**: *Citrus sinensis*
4. **Blood orange:**
5. Acid less:
6. Seeded and Seedless:
E. Orange Cultivars:
1. 'Valencia', ' Delta' and 'Midknight' 'Rohde Red'
2. 'Pineapple':
3. 'Hamlin':
4. 'Parson Brown':
5. 'Lue Gim Gong'
6. 'Pope Summer' or 'Glen Summer'
7. 'Jaffa' ('Shamouti')
8. 'Washington'
9. 'Cara Cara'
10. 'Marrs'

F. **Sour oranges**: *Citrus aurantium*.
G. **Navels** with **stylar end**: 'Salad Fruit'

Grapefruit: *Citrus x paradisi*. Discovered in Barbados in 1750. Hung in clusters (thought to be forbidden fruit). The US produces 74% of all world since 1823, 69% coming from Florida. Grapefruit is 1/10th as popular as an orange. Pink and red forms. Early and midseason and late types. Trees grow to about 30 feet tall and wise. Heat zones 12-10.

'Duncan' Oldest known grapefruit selection in Florida and the one from which all others developed. Extremely seedy white flesh with better flavor than modern seedless types. Good for juice, hardy.
'Marsh': "Triumph of Florida'. Main white-fleshed commercial kind. Seedless offspring of 'Duncan'. A pigmented form, 'Pink Marsh' ('Thompson') tends to lose its pink tones as the season progresses.
'Star Ruby' 1926 introduction with red flesh, seedless. Tree is subject to cold damage, erratic bearing and other growing problems.

Mandarin Group: specialty fruits, zipper/loose skinned "Kid gloves". Often slightly flattened-looking fruit. Most produce in winter. Many mandarins tend to bear heavily in alternate years.
Satsuma: *Citrus unshiu* Japan 1600 AD, grapefruit origin.
'Owan' introduced in Florida in 1876, cold resistant.
'King' *citrus nobilis*, from Saigon, introduced 1880 to California. Largest of mandarin, thick rind.
Tangerines: introduced in 1841 (*Citrus reticulata* Blanco). Imported from Tangers (Moracco). Selections with red-orange peel are usually called tangerines. 'Clementine' (Algerian tangerine). Sweet, variably seedy flesh. Ripens early, holds well on tree.
'Dancy' (*Citrus tangerina*) Traditionally Christmas 'tangerine'. Ripens late fall into winter. Needs high heat. Small, seedy fruit. Alternating cycle of overbearing one year.
'Ponkan' "Chinese Honey Orange". Early crop of seedy, very sweet fruit. Alternate bearer, good for Florida.
'Oneco' tangerine from India introduced in US in 1888 by Royal Palm nursery.
'Cleopatra' *citrus reshni.*

Lemons: *Citrus limon*
Citrus lemons from Burma. Commercially produced in Florida in 1870. Lemon concentrate is big market. Gets scab disease due to high humidity. Most grow 20-25 feet tall and wide.
'Eureka' Familiar lemon sold in grocery stores. Some fruit all year in mild climates. Big, vigorous, nearly thornless tree. Prune regularly to maintain tree shape and make fruit easily accessible for harvest.
'Lisbon' mostly produced in California. Fruit is similar to 'Eureka', but tree is bigger, thornier and more clod tolerant. 'Lisbon Seedless' is the same but without seed. These are the best lemons for hot, dry areas. Bear some fruit all year in mild climates. Prune regularly to maintain tree shape and make fruit easily accessible for harvest.
'Sicily' produced since 1953
'Harvey' introduced in 1940 by Harvey Smith
'Villafranca' introduced 1875 from Sicily
'Ponderosa' (American Wonder') Thorny lemon-citron hybrid, naturally dwarf. Seedy, thick-skinned, moderately juicy fruits weighing up to 2 pounds apiece. Some fruit all year., More susceptible to cold than true lemon. Thrives indoors.
'Meyer' (*Citrus meyeri*) is ornamental, some juice but doesn't look like a lemon. 'Improved Meyer' is a hybrid between lemon and sweet orange or mandarin. More cold tolerant than true lemon. Bears yellow-orange, juicy fruit with few seeds throughout the year. Can grow to 15 feet tall but is usually considerably shorter.

Limes: *Citrus aurantifolia*
Small thin skinned, very acid, from Malaysia, not cold hardy. Naturalized in Canaries and West Indies.

Calamondin (*C. madurensis*) from the Philippines. A mandarin-kumquat hybrid with fruit like a very small orange but sweet, edible rind. Juicy, tart flesh has some seeds. Variegated form is especially ornamental.
'Rangpur' often called Rangpur lime, though it's not a lime and doesn't taste like one. Fruit looks like and peels like a mandarin. Less acid than lemon; a good base for punches and mixed drinks.
'Bearss' ('Persian' , 'Tahiti') Commonly grown in Florida. To 15-20 feet tall and wide. Thorny and inclined to drop many leaves in winter. Angular and open when young but forms a dense, round crown with mature. Seedless. Almost the size of a lemon. Is green when immature, light yellow when ripe. Matures winter to late spring though some fruit ripens all year.
'Palestine sweet' (*C. limethioides*) Shrubby plant to 15-20 feet tall and wide, with acidless fruit resembling that of 'Bearss' and used in Middle Eastern, Indian and Latin American cooking. Ripens fall or winter.

Citrons (*Citrus medica*) First citrus cultivated. Plant is small, thorny, irregular in shape; grown for its big, fragrant, unusual fruit. Very cold sensitive. Rind/peel of 'Etrog' preserved/candied for fruit cakes. Pulp and juice useless.

Tangelos (*Citrus x tangelo*): Hybrid of tangerine (*Citrus reticulata*)/mandarin and grapefruit. Best with a pollenizer like 'Dancy' or 'Clementine' or another tangelo. Grows 20-30 feet tall and 10 feet wide. Some cultivars are:
'Minneola' bears bright orange-red fruit (often with a noticeable neck) with rich, tart flavor and some seeds.
'Orlando' or 'Lake' produces mild, sweet, fairly seedy fruit about a month earlier than 'Minneola'
'Nova' Cross between 'Clementine' mandarin and 'Orlando' tangelo. Juicy, richly sweet fruit fall to winter. Needs a pollenizer.
'Lee' Hybrid between 'Clementine' and an unknown pollen parent. Fairly seedy fruit matures fall to winter. Has best flavor if grown in Florida.
Tangors is a cross of tangerine/mandarin and sweet orange. Especially well adapted to sweet orange-growing areas in Florida. Select 'Murcott' or 'Honey tangerine' or 'Ortanique'.
"Temple' found in Jamaica in 19th century. Bears a winter-to-spring crop of sweet to tart, seedy fruit. Needs high heat and is more cold sensitive than other Tangors.

Pomelo/Shaddock: *Citrus grandis*

Limequats: These hybrids of 'Mexican ' lime and kumquat are more cold tolerant and need less heat than their lime parent. Good lime substitute. Edible rind. Some fruit all year, but main crop comes from fall to spring. 'Eustis' bears fruit shaped like a big olive. 'Tavares' has elongated oval fruit on a more compact, better-looking plant than 'Eustis'.

Cultivation: standard fruit trees 20-30 feet tall, dwarf

1. Soil: Quite tolerant as long as the soil is fast draining, friable, slightly acid and loamy.
2. Water: Be consistent, regular, moist but not standing, soggy water. Water heavy during active growth and fruiting.
3. Fertilizer: balanced or high nitrogen and potassium, slow release or 8-4-9 and magnesium for good fruiting. One pound per inch of trunk diameter. Apply micro-nutrients: iron, zinc and magnesium.
4. Temperature: Most kinds of citrus flourish in areas with warm to hot summers and mild winters. Most sensitive are lime. Depends on rootstock and location.

Intermediate temperature for sweet orange, grapefruit and some mandarin and hybrids. Cold resistant (in the teens) are Kumquat, Satsuma, mandarin, Calomondin and the Hardy orange (*Poncirus trifoliata* used as rootstock).
5. Sun: They need full sun and protection from wind, especially during the summer months.

Maintenance: Prune only to remove twiggy, crossing growth, weak or dead branches and to balance. Caution thorny.

Propagation by grafting or from seed. Almost all are grafted. Seedlings bear 10-15 years old.

Pest and Disease: Subject to a wide range of virus diseases, they can be invaded by many pests including citrus leaf miner, bronze orange bug, spined citrus bug, fruit fly and scale...use horticultural oils.
Citrus canker is a contagious bacterial disease: brown spot with halo. Stop producing, loose vigor.

What the judges are looking for:
Fruits may be displayed on a plate. Since most are medium in size, 3 to 5 will be needed in an exhibit. Fruit should be table-ready.
May be exhibited in a Display
May be exhibited as a Collection.
May be exhibited on the stem.

Optional Topic:

Ornamental Grasses

Objectives:

To observe the similarities and differences among these families of plants.
To practice propagation techniques.
To learn the secrets of growing and showing award winning ornamental grasses.

References:

Ornamental Grasses, Bamboos, Rushes & Sedges by Nigel J. Taylor, 1992
The Southern Living Garden Book, pp. 143-145, 165, 295, 297, 320
AHS Great Plant Guide p. 488, 526
Identification Manual for Wetland Plant Species of Florida by R. Dressler, D. Hall, K. Perkins & N. Williams, p. 111
The Botanical Garden by Roger Phillips and Martyn Rix, vols. I and II.

Materials needed for this course:

As many examples of ornamental grasses as available
Grasses and seed heads for propagation and dissection.
Containers, potting mixes, fertilizers, and tools needed for propagation

Introduction: Interest in Ornamental grasses began in the 1980s because Washington DC landscape architect, Jim Van Sweden and Wolfgang Oehme used grasses in public planting at the Smithsonian Institute, Federal Reserve Building, and the WWII Memorial. Prior to that , Europe, especially Germany, was the center of grass development—especially by Karl Foerster in the 1940s. Grasses make up 20% of the plant's vegetation as grasslands: savanna, prairie, plains, pampas. We even have a 'River of Grass" in the Everglades! The grass family is undoubtedly the most significant plant group in terms of usefulness to humans—considered staple foods in most parts of the world. All the world's important grain crops are grasses. Wheat (*Triticum aestivum*), Rye (*Secale cereale*), Oats (*Avena sativa*), Barley (*Hordeum vulgare*) and Corn (*Zea mays*) are best known cereal grasses. The bamboos (giant grasses) are useful in building and crafts. Many grasses are used in lawns or as ornamental annual or perennial plants. Distinctive forms and colors add interest to the garden and flower shows. 'Ornamental Grasses' is really a catchall term used to describe not only true grasses, but related grass-like plants in other families including reeds, rushes, sedges, wood rushes, bull-rushes and a host of others. Characteristically having narrow leaves, hollow, jointed stems and spikes or clusters of membraneous flowers borne in smaller spikelets. Clumping/bunching or spreading/running/creeping by stolon or rhizome, evergreen or not, with color, form, texture, sound, and movement to inspire us. Grasses are monocotyledons—one seed leaf, parallel or linear venation and reduced or vestigial flowers. Birds are attracted to the seed heads, sometimes nesting in the leaves, and insects hiding within. **Cool season grasses** do most of their growing in spring and fall. They set roots quickly in cool spring weather, blossom in early summer, go dormant in the hottest part of the summer and resume their growth in fall. **Warm Season grasses** grow rapidly in the warm summer months, become dormant in winter and turn beautiful colors in the fall.

Uses in the garden: accent, specimen, water garden, ground cover, containers, fence or hedge and in natural areas. Not to be walked on! Excellent for erosion control.

Numerous genera

General distinctive forms and colors of annual and perennial grasses add interest to garden and flower show. May be container grown.

Specimens may include:

Those having distinctive leaf structure

Patterned or colored foliage

Decorative seed heads—Seed heads may appear to have a dried quality as long as stem is green and fresh indicative of current year's growth.

Mature Size: Tall or large which can exceed 12 feet (7 to 12 feet), medium or midsize 5-7 feet, compact, short or small 8-18 inches, and minimals (12" or less).

If shown in a flower show, schedule should indicate length of stem; 30 inches? Unlimited? Bamboo

Usually measured from cut end to tip.

For those having decorative seed head, measured from cut end to tip of seed head.

Single stems unless schedule designates otherwise. Inflorescence and blade may be entered as single exhibit unless disallowed.

Stemless grasses: shown as 5 blades or as a container grown plant

Classification:

Families: names ending in *-aceae*

A. ***Poaceae***: (formerly *Gramineae)* Grass family-- Herbs and shrubs, usually sprouting from underground rhizomes (underground stem), sometimes reedy-stemmed. Bambusa. Flowers in spikelets.

B. ***Cyperaceae***: Sedge family –Perennial herbs often growing in swamps, leaves 3-ranked, grass-like or assembled at the top of long slender stems. Clump forming and with runners. Leaves with papery sheathing. Dense tuft of narrow evergreen leaves, standing erect, but soon lengthening and arching outwards in symmetrical fashion to produce a mop-head or 'pudding basin' hairstyle effect. Flowers are unisexual (male and female flowers on same plant) in separate spikes or in different parts of the same spike. Female flower enclosed in a sack-like structure (perigynium), which later encloses the fruit. Fruit is a nutlet, (some 2-sided or 3-angled). Resembling grasses but having solid rather than hollow stems. "Sedges have edges"—solid triangular stems.

C. ***Juncaceae***: Rushes—Annual or perennial, grass-like herbs, usually from a rhizome, often clump-forming, sometimes colonial. Leaves are cylindrical/round or flattened, with sheaths at bases. "Rushes have ridges". Inflorescence stalked, usually branched, with or without leaflike or stem-like bracts. Flowers are small, green to brown or reddish with 6 sepals and 3 or 6 stamens. Fruit is a 3-chambered capsule with many small seeds. Most species

prefer saline or freshwater marshes, swamps, shores, meadows, sloughs, wet forests, wet roadsides, ponds or streams.

Definitions: **Glumes**: (husk, to peel), either of the 2 empty sterile, chaffy bracts at the base of a grass spikelet or similar structure on the spikelets of sedges,

Awns: any of the bristly fibers on a head of barley, oats

Lemma: the outer or lower of the 2 bracts or scales surrounding or enclosing the flower of a grass,

Spikelet:(ear of corn) a small spike or unit of grass inflorescence (as in the flower cluster of grass), consisting of one or more flowers and their bracts.

Ligule: a thin membrane attached to a leaf of grasses at the point where the blade meets the leaf sheath

Culm: a stalk, stem, akin to blade of grass, the jointed stem of various grasses, usually hollow)

Genus:

1. **Grasses**: Generally low maintenance, deer resistant, insect and disease tolerant. Grasses have very architectural forms: strong vertical lines or graceful fountaining arches. Their colors range from blue, red, variegated, tan and chestnut brown. Grasses provide seasonal interest in motion and sound after the seed heads are gone. *Achnatherum, Aegilops(*annual, related to rye and barley), *Agropyron, Agrostis, Aira* (hair grass), *Alopecurus* (foxtail grass),*Andropogon* (native blue stem),*Anthoxanthum*(Vernal grass—short, flat upper leaf blades and loose, elongated heads of spikelets), *Arrhenatherum* (bulbous oat grass or onion couch), *Arundo* (giant reed with corn-like leaves striped green and white), *Avena* (animated oat—fodder, branching head of hanging spikelets with long,stiff awns), *Bothriochloa* (beard Grass), *Bouteloua* (mosquito or signal-arm grass), *Briza* (quaking grasses with dangling spikelets trembling or dancing in the wind—large, smooth, rounded spikelets on very thin an ddelicate stalks-dry ground, perennial or annual), *Bromus* (brome, reserve grass), *Calamogrostis* (Feather reed grass—the cultivar 'Karl Foerster' was the perennial plant of the year for 2001, a cool season grass with vertical form to 3", likes sun and moisture), *Chasmanthium* (spangle grass or Northern Sea Oats--grows in shade—dangling flat, oatlike seed head, wide flat leaves to 4', "wild oats"), *Chionochloa* (tussock grasses from New Zealand all featuring dense clumps of arching foliage), *Coix* (Job's tears), ***Cortaderia*** (Pampas grass—huge tufted plants with tall stems and dense heads of silky florets—saw-edged blade—male and female flowers on separate plants-male plants the branches of inflorescence point upwards, female plants they are more spreading), *Corynephorus* (grey hair grass), *Cymbopogon citratus* (Lemon Grass), *Dactylis* (British native cocksfoot), *Deschampsia* (Tufted or wavy hair grass—tufted 2'grasses with a branching head of small, shining spikelets with short awns, sun perennial), *Elymus* (invasive but fine Blue Lyme grass, Blue wide rye), *Eragrostic* (African or weeping love grass), *Festuca* (fescue or blue grass, 6" clump), *Glyceria* (Manna Grass, 2-3', sun, variegated, grown in water), *Hakonechloa* (Golden-

yellow streaked-Japanese Forest Grass, waterfall form, fall =pink and red highlights, 14", part shade), *Helictotrichon* (Blue oat grass, spiky dome form cool season, evergreen full sun 18", powder blue foliage, gravelly, infertile soils), *Holcus* (carpeting or velvet grass), *Hordeum* (Squirrel's tail or foxtail barley), *Hystix* (Bottle brush grass—means porcupine), *Imperata* (Japanese Blood Grass—no flower), *Koeleria* (Crested hair grass), *Lagurus* (Hairs tail), *Melica* (nodding Melick—smooth, often silvery spikelets on very thin and delicate stalks, with only the lower 2 florets fertile—dry ground—'Atropurpurea' is purple form), *Milium* (Bowles' golden grass), ***Miscanthus*** (Maiden grass, Silver grass, Eulalia grass –at least 40 forms, striped and red leaves—tufted, fountaining plants with leaves up the stem and a flat-topped or pyramidal head of branches on a short axis and silky-flowered spikelets—'Gracillimus' is narrow, 'Strictus' has yellow bands, 'Variegatus' since 1900, 5-6'tall, flowers 8'), *Molinia* (Purple moor grass—tolerates part shade-'Sky racer', deciduous, sun and moisture, 2-3 ' tall with 5' flower stalks), ***Muhlembergia*** (Muhly grass 2-4' tall, sun to light shade, native to NC and FL), *Nolina* (Basket grass, ground cover), *Panicum* (Panic grass, Deer tongue grass and red switch grass-late season red foliage, fine texture, 6' , sun, 'Shenendoah', 'Heavy metal', Dallas Blue', 'Cloud'), ***Pennisetum***, (fountain grass—Grasses with long heads of spikelets each surrounded by slender bristles—dry ground, annual or perennial—'Burgundy Giant' 6', sun to shade), *Phalaris* (Ribbon or canary grass—perennial or annual—branching or compact head of small, crowded, 3-flowerered spikelets. White striped form 'Picta', commonly used as birdseed, 3', invasive), *Phleum* (Timothy grass or cat's tail), *Phragmites* (Reed used for thatching, tall plants forming reed beds, with branching heads of silvery spikelets—swamps, perennial), *Poa* (mat-forming meadow grass), *Polypogon* (Beard grass), *Rhynchelytrum* (Ruby or natal grass), *Saccharum* (9' tall Revenna grass), *Sesleria* (Blue moor grass—leaves are blue-green, underside is white), *Setaroa* (Foxtail millet), *Sorghastrum* (Indian grass, 'Sioux Blue' blue foliage, upright, 3', sun, flowers 8-12" long), *Sorghum* (Broom corn), *Spartina* (Cord grass), *Spodiopogon, Stenotaphrum, Stipa* (Pheasant grass—perennial, large tufted plants with tall stems and loose heads of awned spikelets or shorter plants with exceptionally long and silky awns, dry ground or mountains, rocks), *Triticum (*Bread wheat, most common temperate cultivated grass—used for pasta and semolina), *Zea mays* (maize, Indian corn—stout annual, tall with male flowers at the top and female in the lower leaf axils—Maize is the 3rd most important grain crop in the world after rice and wheat. Developed around 6000 years ago by selection from the wild annual teosinte—earliest finds in Mexico).

2. **Bamboo** (Giant Grasses) subfamily of grasses found throughout the tropics (generally where clumpers or sympodial types are found) and in moist temperate areas in Asia and South America (generally where the running or monopodial types are found), particularly diverse in China and Japan. Hard-walled with ringed joints and shallow roots. Fastest growing vegetative plant growing 1 foot per day, 2" an hour. Has a bad reputation for spreading aggressively. Plant a root barrier 30" deep or container or choose clumping

kinds. Some grow70 feet tall with 8 inch diameter. Over 150 cultivars of the species. Treat as a grass with high nitrogen fertilizer as needed.Rarely flowering, wind pollinated: *Arundinaria disticha* (dwarf fern leaf bamboo, can mow, *A. pygmaea*). *Bambusa* is the clumping type. *Chimonobambusa*, (distinctly swollen nodes), *Chusquea* (Chilean bamboo with thick, solid, pithy culms of greenish yellow, clump forming. Sheathed, branches numerous at the node), *Himalayacalamus* (rounded sheaths and pubescent ligule), *Indocalamus, Phyllostachys* (Black (Nigra) bamboo with hollow stems, sheathed, grooved, cold hardy, edible new shoots, fast spreader. *P. aurea* is "Golden Bamboo", fishing poles to 20'), *Pleioblastus* (Dwarf and variegated, spreading, persistent sheaths), *Pseudosasa* (Arrow bamboo, Green Onion Bamboo, cold hardy 15' tall, thicket-forming and sheaths persistent and longer than the internodes), *Sasa (*large leaved, spreading with slender stems),*Sasaella (*spreading with slender, upright stems and rather small leaves from Japan), *Semiarundinaria (*thicket-forming bamboo with falling sheaths hanging by their bases) *Shibothea*(2 feet tall, cold hardy, slender stems, textured leaves), *Sinarundinaria* or *Fargesia* (slender hollow canes, branching at nodes) *Yushania* (rampant grower, in forests in China, from Taiwan to northwestern Himalayas. The American Bamboo Society is located in Solano Beach, CA.

3. **Sedges**: ***Carex*** (flat, grass-like leaves in groups of 3, triangular flowering stems and the male and female flower on separate spikelets—males at apex), ***Cyperus*** (from South Africa-flat, grass-like leaves in groups of 3, the triangular flowering stems, and the male and female flowers on short, flattened spikes arranged in a much-branched or simple umbel), *Eriophorum* (cotton grass—grass-like leaves in groups of 3, with a triangular tip and with long silky hairs that surround the fruit. Used to stuff pillows), *Schoenus, Scirpus* (Fiber Optic grass), *Uncinia* (grass-like leaves with triangular tip, the terminal spike with male flowers at the tip, female below, the female flowers with a long hook protruding from the tip of the utricle). Pollination by wind.

4. **Rushes**: *Juncus, Lazula* (woodrush) with flat, grass-like leaves, usually with scattered white hairs on the surface and small brownish flowers followed by dark brown, shining capsules. Seeds dispersed by ants. Many of these plants feature pale brown seed heads in the summer.

Species:

1. **Grasses**: ***Cortaderia selloana*** (Pampas Grass) an Argentinian name, native to South America, Named after Friedrich Sellow. A perennial grass, large, densely clumping. Sheathed. Evergreen. Dioecious with both male and female plants. Reaches 6-8 feet in height with an equal spread. Grows rapidly. Hardy to Zone 5. Leaves are simple 5' to 7' long, 1/2" wide at the base, tapering to a point at the drooping apex. The leaf margins are saw-toothed! Flowers are silvery-white, tiny, in terminal panicles (plumes) 1' to 2' long and held1'-3' above the leaves. Plumes appear in August, persisting until January. Often used in dried arrangements. Grown commercially in California. Seed (fruit) is caryopsis, small and usually not viable. One cultivar has a pink plume. *C.s.*

pumila has waist high foliage. "Gold Band" is gold and green, "Silver Comet' is green and white.

Miscanthus sinensis (Chinese Silver Grass, Eulalia, Japanese Silver Grass) A herbaceous perennial with upright clump growing to 8' tall. Species is hardy to Zone 5 (other species and cultivars will vary slightly). Native to eastern Asia but being bred in Germany. Leaf blades are mostly basal arising from a large clump. Leaves are flat 3' to 4' long, Sharply serrate! Flowers are pale pink to reddish and are borne in a loose, terminal panicle that is 8" to 10" long. The flowers are long lasting when dried. Bloom period is fall but the flower effect of the plume lasts nearly all winter. Many cultivars including 'Gracillimus' (Maiden Grass), 'Purpurescens' with silver pink inflorescence, and reddish foliage, 'Zebrinus' (Zebra grass) with horizontal yellow bands on leaves), 'Yaku Jima' (a dwarf variety to 4' tall). 'Silberfeder' is a German selection with 7' plumes, striped foliage to 5', clumping.

Pennisetum alopecuroides (Chinese Pennisetum, Perennial Fountain Grass) Pennisetum is derived from *penna*, a feather, and *seta*, a bristle and refers to the feather bristles (awns). The flowers look like bottle brushes. Likes sun. A herbaceous perennial with leaves strongly arching creating a mounded habit, 3' to 4' tall. Hardy to Zone 5, native to China, Australia and Eastern Asia. Culms are slender and grow to 4'. Foliage is bright green in summer and turns golden brown in fall. Single flower spike is 5" to 7" long and bristles are long and prominent with a scabrous texture. Resembling bottle brushes in fall. Cultivar 'Hameln' is a dwarf fountain grass 2' to 3' tall as is 'Weserbergland'. *P. setacum* is Purple Fountain Grass. 'Caudatum' is an early bloomer with shite plues. 'Viridescens'has broad leaves.

2. **Sedges**: *Carex elata* 'Aurea", *Carex hachijoensis* 'Evergold' (both gold leaved). *Carex glauca* is silver-gray evergreen sedge reaching 10 to 12 inches high. Hardy to Zone 7. *Cyperus alternifolius* (Umbrella flatsedge). *Carex morrowii* (Japanese sedge).

3. **Rushes**: *Juncus effusus* 'Spiralis' is known as Corkscrew Rush which is very descriptive of the strange mode of growth—spiralled, cylindrical, shiny green
leaves. *Juncus inflexus* 'Afro' has blue green leaves and needs neither damp soil nor water. Lazula (Wood rush, 1 foot evergreen)

Cultivars/Varieties: Within the last 5 to 10 years over 200 new varieties have been introduced. Over 20 varieties of *Festuca* alone!

Cultivation:

A. Light: Grasses grow best in full sun but will tolerate partial shade. Some grasses can be grown in shady areas.

B. Soil: Grasses grow well in most soils except very wet ones and tolerate drought and salt spray. Little soil preparation is needed—just remove weeds from an area and plant. Add peat, humus to 8-12 Inches for well draining.

C. Water/Humidity: While the majority of grasses can thrive in a xerophytic or naturalized environment, some perform well in water gardens (*Carex, Arundo, Cypereus, Scirpus,* etc). Drought resistant.
D. Fertilizer: rarely needed, but nitrogen is good.
E. Temperature: Annual warm season grasses can be killed by frost. Hardy cold season perennial grasses return each spring. Heat resistant.

Maintenance: very low maintenance once established.

1.Mulch: To maintain even soil temperature, moisture and to discourage weeds, mulch grasses to 3 inches with organic material.
2.Pruning: Grasses should be cut back to 18' high after blooms fade in late winter or before new growth appears in spring—cut witin 1-2" of the ground for low growing plants. Transplants best in Spring.
3.Coping with aggressive species: Invasive species can be grown in pots, physically restricted by a barrier or bordering material, or simply allot the space and divide when the space is exceeded.
4.No need to deadhead or stake.

Disease and Pests: Ornamental grasses are usually low maintenance in relation to insect and disease problems. They provide snug winter shelter for many beneficial insects. Occasional green fly or black fly. Rust on the leaves should be treated early with suitable products.

Propagation:
A. Division of Rhizome: Divide the clump in spring to mid-summer. Division is required every 3-5 to 10 years to prevent the center of the plant from opening up. Simply lift the grass and pry apart the crown with a spade or two back to back forks. Replant and water regularly until established.
B. Seed: Annuals are usually grown from seed (awns) each year. If the grass is hardy, direct sow collected dry seeds in the autumn. Cover lightly with soil and keep moist. If the grass is tender, sow into prepared soil after danger of frost has passed or sow in pots or trays, harden off and then plant outdoors. Some reseed freely (*Panicum* or switch grass)

What the Judges are Looking For: Ornamental Grasses can be used as specimen or accent plants, screens or informal hedges, ground covers, in park settings, as massed plantings and in small show gardens. Ornamental Grasses may be entered in sections of cut annuals, cut perennials, cut decorative foliage, container grown or collections and displays in the Horticulture division. Can be considered an herb (Cymbopogon). May include those having distinctive leaf structure, patterned or colored foliage, decorative seed heads or by size: Large (exceed 12 feet), Midsize (5-7 feet) or Compact (8 to 18 inches).
Schedule should indicate length of stem, measured from cut end to tip or cut end to decorative seed head. The seed head may be dry, but the stem should still have evidence of being green and fresh, current year's growth. Number per bottle? Use the foliage form or flowering form for <u>all in a class</u>.

Cultural Perfection: described as the end results of a plant having received the culture necessary to grow as near to perfection as possible. The plant should be actively growing, vigorous, fresh, alert, full of substance, free from damage, disease, insect problems, clean and well-groomed. The symmetry is the placement of the plant parts equally about an imaginary line drawn through its center. Vigor is the strength and vitality of the plant, no wilting or limpness. Color of the foliage and seed head should be typical for the specific grass. Many of the grasses are grown for their color which should be even and well developed in both foliage and seed head. Some grasses color in late summer and fall and should be shown to display this color. Many grasses are large plants, which, when grown in a container, will not develop full size. Maturity is determined by the presence of seed heads, or flower spikes and development of plant into its typical habit of growth--arching, mounding, tufted, etc. The form of the plant should be typical for the habit of growth. Leaf blade placement on stems should be uniform with uniform spacing between leaves. If long, single blades are typical, they should be evenly spaced around a well-rounded plant. If the form of the foliage is correct, the symmetry will be well developed.

Grooming and Staging: Staging is the presentation of the plant at the time of showing. Container should be clean, harmonious, not cracked or broken, in proper proportion to the plant. Free from dirt and debris, residue and dried or dead leaves.

Distinction: Marked superiority in all respects. Consider the points deducted above and use the rule of thumb to justify taking additional points here.

Labeling: Label should be readable, correct botanical naming on an acceptable card/tag/marker placed where it can be seen. It should be un-smeared and correctly spelled.

Awards Eligibility: Sectional Awards of Merit, Grower's Choice, Collector's Showcase and Horticultural Excellence if scoring 95 or better.

Optional Topic:

Palms and Cycads

Objectives:

To compare the similarities and differences between the types of palms and cycads.
To practice propagation techniques.
To learn the secrets of growing and showing palm and cycads.

References:

International Palm Society, Lawrence, Kansas
Cycad Society: www.cycad.org
Palm and Cycad Society of Florida: www.plantapalm.com
ENH 1094/EP354 UF EDIS publications: "Palms for North Florida"
"Native and Exotic Palms of Florida", UF Bulletin 152-A

Materials needed for this unit:

Seed and potting mix suitable for starting.
As many examples of fronds or plants as possible.
Cones if available.

Introduction: Linnaeus referred to palms as the "princes of the plant kingdom". Palms stand for all that is noble and grand in the plant world. Dr. Henry Nehrling wrote that "Florida is the land of Palms". Economic value includes fiber (coir), fruit, wax, oil, wood.

Classification of Palms: Any of various chiefly tropical evergreen trees, shrubs or woody vines of the family Arecaceae having unbranched single, cylindrical trunks, suckering or branching trunks with a crown of pinnate, palmate or costopalmate leaves having conspicuous parallel venation. Trunks can be manipulated by man to be clean, fatter than natural. A prominent part of the Florida landscape. Approximately 2800 species of palms known with 12 native to Florida (8 in south FL and 4 in north FL). The finest display of palms (some 700) can be found at Fairchild Botanical Gardens in Miami.

Family: Arecaceae (formerly Palmae)

Genus and species: Approximately 200 genera (10 native to the USA) and over 2800 species.

A. **Palms for your landscape**:

Butia capitata (Brazilian name meaning 'dense headed'-native of South America): Pindo Palm, this is a medium sized (commonly 10-12 feet tall but sometimes up to 30'), slow growing, single trunked (1-2 foot diameter), erect palm stiff, with a strongly recurving canopy. The leaves are pinnate, 8-10 feet long, the petiole is induplicate (folded like a trough) armed with straight thorns pointing toward the leaf tip. Blue-green in color. Can be used as a specimen, accent or street planting or in planters. The leaf bases persist along the entire trunk. Flowers are monoecious, small and on a stalk up to 5 feet long. Fruits are drupe, yellow to red, oblong and ovoid shaped to 1 inch long, densely clustered, pulpy, fibrous and edible with pineapple/banana taste (also called a Jelly Palm and mistakenly referred to as Cocos: coconut). Fruits can be messy along a sidewalk. Can be propagated from seed. This palm needs full sun and tolerates hot, windy conditions including asphalt and concrete areas. Highly drought tolerant. Tolerates various soils and moderately salt tolerant. Problems include micronutrient deficiency, scale and

the palm leaf skeletonizer. One cultivar, 'Strictior' features erect petioles vice recurved. Zones 9-10 but can be grown in all areas of Florida.

Sabal palmetto: Cabbage Palm, our state tree, commonly growing 20-40 feet tall but can grow up to 90 feet tall. A monocot. This is a medium sized, single trunked (to 18" in diameter), erect palm with a dense, tight globular canopy, native to the eastern US (does not occur naturally in the western portion of the panhandle). The leaves are costapalmate (fan shaped) to 6 feet long and 3 feet wide, divided 1/3 of the way to the base. Segments are long, tapering, pointed, with a split at the apex. Many threads, filaments or hairs are in the sinuses. Overall color is green or grey-green. The petiole is unarmed but goes completely through the length of the leaf. The flowers are hermaphroditic, inconspicuous and on stalks to 4 feet long hidden among the leaves and multi-branched. The fruits are drupe, brown-black and globose to ¼ inch in diameter and shiny, ripening in the fall. Propagation is from seed. This palm enjoys full sun to partial shade. It is highly salt tolerant, easily transplanted and grows in various soils. Can be used as a specimen tree, framing tree or street planting. "Boots" usually fall away leaving a smooth or slightly ridged trunk. Root zone can migrate up the trunk. Several related species: *Sabal minor*, or Bush Palmetto, stays low, has a smooth petiole and flatter leaf. Can take some shade as it is an understory palm without a trunk. The *Sabal mexicana* is better known as the Texas Sabal Palm and *Sabal bermudana* or Bermuda Palmetto are also available. Problems include the Palm weevil and palm leaf skeletonizer.

Serenora repens: Saw palmetto, named for botanist Sereno Watson) A clumping palm, low and bushy with multiple trunks. Can reach heights of 20 feet tall but normally upright in the 4-5 foot range. Spread increases with age. Growth rate is moderate. Flourishes in all areas of Florida—can take salt. Native to sandy areas and pinelands and coastal locations throughout the southeast US. It often forms extensive, dense colonies. The trunks normally creep along the ground and are rarely erect. They sucker in contact with the ground. The trunks are 9 to 12 inches wide and covered with brown fiber and old leaf bases. Leaves are palmate to 3 ½ feet wide, deeply divided into 25-30 stiff, tapering segments with cleft tips. The leaves are normally green, but there are bluish-silver varieties. The 3-4 foot long petioles have small, sharp sawteeth covering the margins of the basal half. Flowers are whitish, small on a 3 ½ foot long flowerstalk with numerous short branches. Flower stalks appear among the leaves in spring. The flowers are a source of high-grade honey. Fruits are yellowish, turning black at maturity, ellipsoidal to 1 inch long, ripening in August through October. The saw palmetto needs full sun to partial shade and will grow in even poor soils so long as they have good drainage. It is highly salt tolerant and virtually pest free. Propagation is from seed. Seedlings grow very slowly and transplants poorly from the wild. Gives a naturalistic effect to any yard. There is a silver variety. Natural medicine to prevent prostate cancer.

Washingtonia robusta: Mexican Fan Palm--Washington Palm named after George Washington, means strong/stout. A large single-trunked erect palm with loose, globose canopy to 80 feet tall but commonly seen at 40-50 feet tall. Rapid growth and native to southwestern US and Mexico, can be grown in all areas of Florida in Zones 9 and 10. The leaves are palmate to 4 feet across, divided half way to the base. Features many threads in sinus when young, disappearing with age. Segments are bright green, petiole reddish-brown, armed with thorn pointing in both directions. Leaves often persist forming a dense skirt. The trunk can be 2 feet wide or wider at base with angled rings and vertical cracks present. Flowers are hermaphroditic, small, numerous, on a white stalk to 12 feet long. Flowers are not showy. Fruits are drupe, black, oval and about 1/3 inch long. This palm needs full sun and is moderately salt tolerant. Tolerates various well-drained soils. Propagation is by seed. Problems include the palm weevils, root rot, persistent leaves. Armed petioles on falling leaves are dangerous. Resistant to Lethal yellow

Disease. Can be used as specimen, accent for tall buildings and as street plantings. The cultivar *W. filifer,* Petticoat Palm, has a larger trunk.

Rhapidiphyllum histerix: Needle palm, native (Rapidly falling into history) 4-ply leaf, cleft leaves, needles at base. Low-growing to 6', an understory plant (can take shade), clumping. Needles are port of the leaf sheath and can be pruned off. Leaves are palmate, very dark green on top but whitish on back and divided almost to the petiole. Trunk is covered with brown fibrous mat. One of the most cold hardy to zone 7: Native from Florida to South Carolina.

Phoenix canariensis: Canary Island Date Palm: very long pinnate leaves spanning 12' and a massive trunk of 3' diameter. Very cold hardy palm. Give it plenty of sun and plenty of room (at least 25' from edge t o edge). Fast growing. Leaf petioles have dagger like spines. Not a true date producer. Related palms: *Phoenix dactylifera*, true date palm, *Phoenix robelini* or pygmy date palm is a graceful plant from SE Asia. Feather-shaped leaves are medium green with individual segments narrow and soft looking. The base of each leaf is modified into spines. Needs bright indirect light. *Phoenix reclinata* or Senegal date palm suckers at the base to form a multi-trunked clump.

Trachycarpus fortunei: Windmill Palm (native to China, named after Robert Fortune, means 'rough fruit'). Small to medium sized, single trunked, erect palm with a slow growth rate—an understory plant—some shade needed. Usually seen 5-10 feet tall but can grow to 40 feet tall with a trunk 1 foot in diameter or more slender, densely covered with brown fibers (furry) and old leaf bases. The leaves are palmate to 3 feet across, divided almost to the base. Segments often drooping near tips, dark green above, glaucous beneath. Petiole is unarmed but bumpy and rough. Flowers are monoecious, small, yellow and fragrant. The flower stalk is very short, branched. Fruits are blue when ripe, tree-lobed to ½ inch long. Propagation by seed. Enjoys full sun to partial shade, fertile well-drained soils. Is moderately salt tolerant and moderately drought and wind tolerant. Use as an accent, specimen, or framing tree or in an urn. Does well in confined areas –doesn't like wind. May get scale, palm aphids, root rot and is moderately susceptible to Lethal Yellowing Disease. For a dwarf windmill palm try *Trachycarpus nana*. *Trachycarpus wagneriana* or "Waggy Palm" or "Bonsai Palm" is highly wind resistant and cold hardy and likes full sun.

*Mule Palm, *X Butiagrus nabonnandii*, is a hybrid made by crossing the cold-hardy pindo palm with the more tropical queen palm. The result is a cold-hardy palm with a tropical feel that grows in Hardiness zones 8-11. It is salt-tolerant but needs good drainage.

Bismarkia noblis: Bismark Palm is good for south of Lake Okeechobee where temperatures don't get below freezing. Native of Madagascar. This palm gets to be massive! Silvery blue-tinted fronds are stiff, giant fans, bold form. Difficult to move once established. Full sun to light shade.

B. **Indoor and container-grown Palms**:

Chamerops humilis: European or Mediterranean Fan Palm is native to southern Europe. A small palm with stiff petioles and light gray or silver cast. It has a deeply cleft, palmate leaf. Petioles are armed with thin but sinister, orange teeth. Usually seen as a 2' to 6' specimen but may grow to 15'. Can be grown in containers. Produces suckers. Can be multi-trunked or pruned to a single trunk. Slow growing, full sun.

Chamaedorea elegans or Bamboo or Parlor Palm, comes from the highland forest of Central America (Mexico). Very tolerant of low indoor light and cool night temperatures—hardy to 10 degrees. Feather -shaped leaves and fern-like appearance. Frequently sold in 2" pots for use in dish gardens and terrariums. Single stem but often planted in clusters. In time the plant will grow to 3' or more and may produce the woody, many-branched stalk bearing its flowers. Bears bright red fruit. *Chamaedorea erumpens (or C. microspadix)*: Bamboo palm grows up to 6'

with fronds spaced farther apart on the trunk giving a bamboo-like appearance. Oriental in feeling. Develops basal suckers, forms natural clump. Give low light and moist culture. *Chamaedorea radicalis*, the Dwarf Bamboo Palm are used as indoor plants. Understory palm. *Chamaedorea hooperiana* 'King Maya' is another classic palm developed for indoors.

Livistona chinensis: Chinese Fan Palm from Asia is a minor player usually found in landscapes as large ground hugging plants. Slowly grows to a height of 30' with a 10' spread outdoors. Palmate leaves are folded lengthwise in the middle of the leaf, yellow green in color. Mostly sold as a houseplant but can be used outside in protected areas.

Raphis excelsa: Lady Palm features dark green fronds that arch, fan shaped and a trunk with a mat of woven fiber. Native to SE Asia. Slow growth reaching to 10' (only getting about 2' tall indoors) but easy to divide new plants (basal shoots) formed in the bottom of the pot (Propagation by division). Prefer low levels of light, dappled shade to full shade indoors. Water evenly, feed monthly with liquid fertilizer during the growing season. Use a well-drained potting soil. Durable and resistant to neglect. Scale is the only major pest. Can be pricey.

C. **Other Palms of note**:

Paurotis wrighti: Saw Cabbage Palm
Roystonea regia: Cuban Royal Palm is a south Florida favorite, native.
Pritchardia thurstoni: is similar to *Prichardia pacifica* or the Fiji Fan palm.
Pseudophoenix sargentii: Sargent's Cherry Palm from the FL keys
Coccothrinax argentata: Florida Silver Palm, native small
Thrinax parviflora: Jamaica thatch Palm, native, small
Thrinax microcarpa: Brittle Thatch Palm, native in the keys, stout tree up to 30' tall
Caryota mitis: Fishtail Palm or the Teddy palm grows to 40' tall
Veitchia merrillii: Christmas Palm
Geonoma: understory palm
Normanbya
Reinmardtias

Culture/Care:

Fertilizer: Fertilize in September, December, March and June with a granular fertilizer (equal rates of nitrogen and potassium plus minor elements) around the outside perimeter of the dripline and under the dripline but never against the tree. Granular fertilizer with slow-release form of nitrogen and potassium are best, in equal amounts. Magnesium deficiency causes yellowing of edge of leaves--treat with Epsom salts. Lack of potassium causes yellowing and loss of the canopy.

Water: Palms can be overwatered. Most of them only need a good watering once a week otherwise leaching can occur.

Repot when they become root bound. Can root prune. Can plant deeper than original root level.

Transplant in warm months (May – September) if you cut the roots. Can transplant anytime if in a pot.

Pruning: Lower leaves can be selectively pruned if yellowing or brown. Remove brown floral parts as well.

Classification of Cycads: Tough tropical evergreens, relics of the age of dinosaurs—100 or 200 million years old. Superficially resemble palms and ferns—NOT a palm--more closely related to Pines and Gingko than palms. Some 100 species of these primitive seed-bearing plants still persist, dispersed among 10 genera and four families all across the earth—one is native to FL.

Classified as ancient, endangered gymnosperms with the common attribute of having a naked seed. Both male and female plants produce modified leaves which resemble cones, which provide a climate-controlled chamber for the delicate process of fertilization to occur—requires moisture. These produce pollen and seeds. Tough evergreen leaves are always compound with a varying number of pinnae, or leaflets, arranged along an elongated leaf axis. Cycads produce one flush of new leaves per year, unfurling, usually during the spring and summer months. Fertilize cycads monthly during the growing season. Some cycads will produce cones one year ad leaves the next. The leaves radiate from a stout trunk, which remains short for many years. In short, cycads resemble a massive armored fern! Enjoy from a distance as these can be ferociously armed with sharp-toothed leaflets or spiny petioles. All cycads contain carcinogens which may be absorbed through the skin so be sure to wear gloves when dealing with seeds. The finest display of cycads (over 750 types) can be found at Fairchild Tropical Botanical Garden in Miami, a living museum that provides seeds and other propagules.

A. Zamiaceae: Over 53 species in this wide-ranging genus and contains a variety of forms.

Zamia floridana (syn *Z. umbrosa, Z. silvicola*) (Coontie/Comptie/Conti or Florida Arrowroot/Comfortroot) A shrubby plant, evergreen with woody subterranean stems and only the leaf bearing tip exposed. Densely foliaged and depending on the individual, may have arching to full erect leaves. Overall height ranges from 1-3 feet tall. Growth rate is variable, and clumps spread slowly. Native to the east and west coast of Florida as an understory plant in pine and oak woodlands and hammocks as far north as southern St. Johns County—considered an endangered plant. Once harvested by native SeminoleIndians because of its high starch content in the underground stem and made into 'Arrowroot flour'. Leaves are pinnately compound, deep green glossy, leathery leaflets. Often erroneously referred to as fronds, the leaflets are known as pinnae. Leaflets are highly variable, ranging from 3-5 feet in length, 1/8inch to 5/8 inch in width but mostly rounded and flat. They may be variously twisted or in one plane. They have parallel venation and possess a small amount of serration near the apex. As the subterranean stems grow, they are continuously pulled into the ground—contractile—branching dichotomous. Flowers of this plant are dioecious: male plants bearing slender male cones in which pollen is produced. The females with fat, seed bearing cones, each sporophyll possessing two naked ovules. Sporophylls of both sexes are shield-shaped and peltate. The cone stalk and sporophylls are heavily tomentose and are rusty to dark brown, borne near the ground and hidden among the crown of leaves. Technically, there are no fruit, but the naked seeds borne in female cones have a thick scarlet to orange fleshy, foul-smelling seedcoat (called the sarcotesta), underneath which lies a stony seed. These ripen in fall-winter, at which time they fall apart, revealing the orange colored seeds. Propagation is by seeds planted after the fleshy layer is removed and the stony layer is scarified (nick with a sharp knife or use concentrated sulfuric acid). Seeds are not long-lived and should be planted as soon as possible. If the seed of any cycad rattles when shaken, it is no longer viable. Seeds that float may also be discarded. Stems often referred to as tubers, may be divided—harvested for starch. Use a sharp spade and keep watch for fungal infections. This plant takes no special requirement other than good drainage. Can survive in a variety of soils and light conditions. Sometimes infected with Scale. Use as a foundation planting or as a subject in small gardens. Larval food for the Atala Butterfly (Eumaeus atala). Since this is such a variable species, selection may be made amongst the various forms which can be found in the nursery: wider or narrower leaflets, arching to erect leaves and leaflets which are twisted versus those which lie in a single plane. For a cycad grown as a houseplant, try *Zamia pumila*.

Encephalartos plants are native to south and central Africa. Over 60 species, most with suckering and clumping habit. Known as Bread Palms or Kaffir Bread because the seeds and

stem starch are used to make bread. These are among the most formidable of all cycads with ferocious armament on both leaflet and leaf stalks. *Encephalartos horridus* is extremely large with unyielding spines. *Encephalartos ferox* is native to Mozambique and is the most attractive and available species in the genus. Leaflets are bright green and glossy and have a number of prominent sharp teeth along their margins. The scarlet cones may be produced five at a time in the crown of female plants and up to 10 at a time in male plants. Considered one of the fastest growing in the genus reaching cone bearing age at 12 years. Usually no more than 3 feet tall.

Zamia skinneri is a rainforest type cycad.

Macrozamia is from Australia and has a colored area of the callous tissue at the base of the leaflets. Over 40 species.

Lepidozamia is from Eastern Australia and contains 2 large, understory species. The male cones open in a prominent spiral at maturity.

Certozamia or "Bamboo Cycad" is from Central America and has over 16 species with prickles at the petiole base. Cones of most species have 2 prominent spine-like horns on the outer part of the sporophylls.

Dioon is a cycad from drier regions and likes a gritty soil mix. From Central America. Twelve species have stiff, straight, non-articulate leaflets with sharp points at the tips. *D. edule* is one of the most cold hardy, drought-tolerant cycads for north Florida.

B. Cycadaceae:

Cycas revoluta: Japanese Sago Palm, King Sago Palm—Greek word meaning 'rolled backward'. An evergreen palm-like plant, upright, often suckering, rarely branched to 10 feet tall, usually much shorter and with slow growth. Native to 3 islands in southern Japan. Hardiest of all Cycas spp.—approximately 10-20 species in the genus Cycas. Leaves are pinnately compound, 3-4 feet long in rosettes. Leaflets to 7 inches long, 3/8 inch wide, glossy green, sharp tips, and stiff. Leaflets reduced to prickles at base of rachis. Leaf scars and persistent leaf bases and spines remain on the trunk. Trunk and leaves are winter hardy. Flowers are dioecious: male cone (microstrobilus) cylindrical to 24 inches tall. Female without cones but with modified scale-like leaves, brown felt covered, grouped into a globose mass. Fruits are ovate orange-red seeds to 2 inches in diameter, somewhat flattened. Propagate by seed (gather seeds only when cones begin to disintegrate—the Kin Sago seeds will sink in water) or the division of suckers. Carefully cut the sucker from the trunk and place in sharp, sterile sand or a half and half mixture of vermiculite and perlite. Only the very base of the offset should be covered. Bottom heat speeds root development. First to emerge from the seed is a long, thick primary taproot. Cycad potting mix should be similar to what one would use for succulents. Sagos enjoy full sun to partial shade, various well drained soils. They are moderately salt tolerant. Scale, mealy bugs, leaf spot and micronutrient deficiencies (particularly magnesium) can be a problem. Use as a specimen plant, accent, in and urn or to create a tropical effect.

Cycas taitungensis (Emperor Sago) has leaves twice as long (to 8') and trunk twice as big as *C. revoluta*. From Taiwan. Doesn't get scale.

Cycas circinalis/Cycas rumphii, the Queen Sago, with much larger leaves (8-9 feet long and longer and wider leaflets). Leaflets are flat, pliable and have a light, powdery bloom that makes them a duller green. Much more graceful and palm-like than the Japanese sago. Very tender to frost. The Queen Sago seeds will float.

Microcycas calocoma is a large plant from Cuba and is sensitive to cold and hard to obtain. It is a primitive plant.

C. Boweniaceae: Have bipinnately compound leaves and dichotomous venation. Mostly from Australia. Has a subterranean stem.

Bowenia serrulata with multiple cones about the size of pine cones

D. Stangeriaceae: From eastern coast of South Africa. Only one species.

Stangeria eriopus: Looks much like a fern. Leaves are produced one at a time.

Culture:

Seeds: unavailability (lack of pollinators or inefficiency of pollen transfer—some cycads are wind pollinated, others insect (beetle) pollinated) receptivity of female cone does not always coincide with release of pollen, slow to germinate. Hand pollination does not guarantee viable seed production.

Division: inadequate, aggravates already endangered status.

Maintenance: Fertilization, irrigation and pruning will result in a healthy, well-grown plant. Prune off all old leaves in early April. Fertilize with slow-release fertilizer and irrigate as needed.

What the judges are looking for:

Caution! Some flower shows will not allow palms or cycads in the show due to size of the exhibit. Because they are so large, they are often difficult to display or are top heavy. Palms may be exhibited out of water and simply placed on a table.

Optional Topic:

Variegation in Plants

Objectives:

To observe the similarities and differences among this vast family of plants.
To practice propagation techniques.
To learn the secrets of growing and showing award winning variegated plants.

References:

Gardener's Latin by Bill Neal (1992)
Variegated Plants: a Gardener's Index to Patterned Foliage by Susan Conder and Andrew Lawson (1994)
Variegated Leaves: the Encyclopedia of Patterned Foliage by Susan Conder
The Plants, Life Nature Library by Fritz W. Went (1963)
www.Gardenguide.com
www.plantdelights.com/tony or go to Plant Delights Nursery, Inc. 9241 Sauls Road, Raleigh, NC, 27603 (919) 772-4794
www.bbg.org Brooklyn Botanical Garden
www.rhs.org.uk Royal Horticultural Society
Horticultural Science (4th ed.) by Jules Janick (1986)
The Plant World (4th ed.) by Harry Fuller and Zane Carothers (1963)
Biology (2nd ed.) by Helena Curtis (1978)
www.en.wikipedia.org

Materials needed of this unit:

As many examples of leaf variegation as available.
Variegated plants for propagation and dissection.
Containers, potting mixes, fertilizers, and tools needed for propagation

Introduction and Review: Variegation is a testament to natures' creativity, ingenuity and simple randomness. From the Latin root *varius* meaning various.

A. Normal green tissue: Cells contain **chloroplasts** (football shaped bodies that can turn within the cell to take best advantage of the light-40 or 50 per cell, millions per leaf!) with light-reacting **pigment** (any substance that absorbs light), chlorophyll, necessary for the plant to conduct photosynthesis (converting the sun's energy into sugar). **Chlorophyll** absorbs light and lends its green color to the majority of plants. Carotenoid pigments also absorb light and are found in chromoplasts. **Carotenoids** make up the plant world's second family of color and is divided into two groups: carotenes (orange color—as in carrots, beta-carotene and vitamin A) and xanthophylls (yellows). **Anthocyanins** (a flavonoid) are the plant world's third family of color pigments. They range in shades from palest pink through red to flamboyant purple (violanin). Anthocyanins, contained in the sap of cells and cell vacuoles, are readily influenced by relative acidity (a contributing factor in hydrangea color, along with soil aluminum: in neutral soil it flowers pink, in acid soil it flowers blue). These pigments are responsible for beautiful fall color in leaves. **Leucoplasts** contain no pigment (colorless) while **chloroplasts** contain pigment (colored).

B. Variegated plants/ornamental leaves include annuals, biennials, tender plants, herbs, perennials, grasses, climbers, trees and shrubs. Usually grown for the foliage

with insignificant flowers. Variegation in leaves is caused by a loss of light absorbing pigments in the plant cells. **Remove only the green chlorophyll and the result is yellow variegation. Remove both chlorophyll and the yellow pigment xanthophyll and the variegation is white.** Yellow variegated leaves are still quite efficient at using the energy of sunlight to produce sugars. Plants tend to grow a little more slowly but will usually tolerate the same conditions as their green leafed relatives. White variegated areas on leaves use none of the sun's energy. Plants with this type of variegation grow more slowly and are often far less vigorous than their plain leafed cousins. Many need shade to prevent burning of the white areas. In the wild they would soon die out but observant gardeners have gathered the best into cultivation.

Definitions: Variegation is defined as **two or more colors per leaf—not a one-colored leaf!** Includes the whole spectrum of greens (ranging from the clear hues of children's crayons to smoky gray-greens), acid yellow greens, cool milky greens and intense blue-greens. Remember, one color can be masked by another: yellow pigment is masked by blue, when both together produce green. (Demonstrate this concept with color film.) Depending on the proportion of carotenoids and cholorphylls, leaves may look anywhere from yellowish green to dark green, with all possible gradations between them. Variegated foliage also offers white, pure yellows (the most advancing color), oranges, reds and purples; shades and tints of cream, beige, pink, salmon, apricot, mauve, russet, scarlet, burgundy and crimson (think of the colors in new coleus). In addition to the bicolor forms, there are tricolors (Zonal Pelargoniums) and multi-colors.

A. How and why of variegation
    1. Virus: various viruses transferred in many ways—some by thrips, for example. In "Parrot" tulips the virus causes an unusual mosaic pattern (stripes, flecks, feathering) on the dark petals and in the leaves. Often called tulip 'breaking'. Mosaic virus affects Clivia, Iris, Abutilon, and Aspidistra.
    2. Chlorophyll: Meristematic tissue losing its ability to produce chloroplasts. Usually causes zonal variegation as in Clovers, Bromeliads, Pelargoniums, Oxalis and Coleus.
    3. Mineral deficiency and environmental conditions: Variations induced by differences in moisture, light, soil nutrients and other environmental factors are not inherited and will not pass to future generations. (Show example of environmental influence). Iron or magnesium deficiencies can cause yellowing generally referred to as Chlorosis and should not be entered in a flower show.
    4. Sports or mutations: (**Sport** is a *visual change* in form, color, or growth habit of a plant due to mutation.) (**Mutation** is a *change in the genetic makeup* of a plant.) Variegated trees and shrubs usually originate from naturally occurring mutations or sports. However, mutations within plants are not always stable and shoots can **revert** to the original green (show example of reversion). The green reverting shoots contain higher levels of chlorophyll and produce more food for growth. As they are more vigorous than variegated ones, they will finally overtake the variegated shoots in size and vigor, so it is advisable to remove them as soon as they are noticed. Take out the

affected shoots back into wood containing variegated foliage. This often means removing entire shoots. Occasionally shoots change to cream or yellow, but because of the lack of chlorophyll these shoots often grow weakly and are less of a problem.

5. Reflective variegation: Sometimes called 'blister variegation' is due to light being reflected off the leaf surface, usually white or silvery. This is caused by an air layer trapped or located directly under the epidermis of the leaf—example: *Pilea*.
6. In the case of Rex Begonias, colored hairs can cause a plant to look variegated.

B. Do not usually reproduce from seed (except for Nastursiums and Money Plant). To retain the variegated feature, these plants are **propagated vegetatively** (asexual) such as from cuttings or layering.
C. Less vigorous and weaker due to less chlorophyll for photosynthesis. May need to provide extra fertilizer. Technically, variegation signals some level of interference with a plant's ability to photosynthesize food.
D. Consequently, variegated plants are neither as hardy as their all-green counterparts—nor as impressive in the flower department. They are rarely seen in the wild.
E. Light requirements vary but a general rule is **the lighter the plant, the more sun while the darker the variegation, the more shade needed**. Morning light is softer, afternoon light is harsh.
F. Color can change from season to season.
G. In monocotyledon leaves, variegation *typically* appears in linear form instead of in irregular patterns as on dicotyledonous leaves. Exceptions to that rule: *Miscanthus sinensis* 'Zebrinus with banded variegation and some philodendrons with irregular venation and variegation.

Forms of Variegation: Can be sharply defined or subtle, can be large scale or minute. Variegation often follows the natural geometry of plant foliar tissue, producing lines, veining, splashes, and edges of symmetrical elegance but it also expresses itself in masterpieces of irregularity. (Show examples of each)

A. Striped: iris, ribbon grass, zebra grass (monocots)
B. Spotted: *Hypoestes* ("Freckle face")
C. Edged: serves to enhance the natural leaf shape
    1. Marginate: emphasis on edges, striking contrasts
    2. Medio-variegation: center is variegated rather than the edge.
    D. Veined: accentuates the internal structure of a leaf: Canna, arum
    E. Mottled
F. Marbled or Mosaic: genetic defects in African violets, virus in Tulips
G. Patterned-mirror image
H. Splotch, blotch, splash
I. Underside of leaves, (birthmarks in African violets)

Landscape use of Variegated Foliage: Overused, variegation can be very messy. Grown for effect, using a scattering of bold, bright white or yellow painted foliage to contrast with a greater mass of plainer green leaves, it can be fabulous. Use variegation for contrast rather than as the dominant theme. There is no lack of varieties to suit any site or situation.

A. Specimen plant
B. Brighten dark corners.
C. Unite a planting scheme by combining the colors of adjoining plants.
D. Define neighboring plants more sharply and let light and texture into what otherwise would be a green mass.
E. Provide color and pattern over a long period, even through the winter.

"Variegated plants add a welcome bit of insanity to any garden."

Botanical Nomenclature used with Variegated Foliage Plants:

A. The entry tag: the key to educating the public.
(*Review how to write botanical binomial names if needed (genus, species and cultivar))

B. Latin clues: *albomaculatus* (having white spots), *albomarginata* (having white margins), *argenteoguttatus* (silver spotted), *argyraeus* (silvery), *atamasco* (stained or streaked with red), *atomarinus* (speckled), *aurantifolius* (golden leaved), *bicolor* (2 colors), *cadmicus* (metallic appearance), *callizonus* (having beautiful zones or bands), *calophrys* (with dark margins), *coloratus* (colored), *conspersus* (spattered, speckled), *discolor* (of 2 or more different colors, variegated), *diversicolor* (diversely colored), *erubescens* (blushing, turning red), *fasciatus* (marked with broad bands of color), *guttatus* (spotted, speckled), *lentiginosus* (freckled), *lepardinus* (spotted like a leopard), *limbatus* (bordered, marked by a margin), *lineatus* (lined, with lines or parallel stripes), *maculatus* (spotted or blotched), *marginalis* (with a distinct margin or border), *marmoratus/marmoreus* (marbled or mottled), *mesoleucus* (with a white central stripe), *nebulosus* (clouded), *notatus* (marked or stamped, spotty), *ocellatus* (eyed), *pardinus* (with leopard-like spots), *pictus* (painted/brightly marked), *polifolius* (with white or gray leaves), *praetextus* (bordered, edged, fringed), *punctatus* (dotted), *quinquepunctatus* (five-spotted), *septempunctatus* (seven-spotted), *striatus* (striated, striped), *striatulus* (faintly striped), *tessalatus* (checkered), *tigrinus* (stripped like a tiger), *tricolor* (3 colors), *tripunctatus* (3 spotted), variegate or variegates (variegated), *versicolor* (variously colored), *vittigera* (bearing stripes), *zebrinus* (zebra-striped), *zonalis/zonatus* (zoned or banded with a distinct color)

C. Writing Variegated Foliage into the Schedule:
   a. Cut Decorative Foliage or cut herbaceous plants:
   examples: *Plectranthus* (syn *Coleus*), Ivy (*Hedera helix* or *H. canariensis* 'Glorie de Marengo'), Canna, Zebra Grass, Hostas (*Hosta crispula* and *Hosta decorate*), *Houttuynia cordata, Eleagnus pungens* 'Maculata'. If a vine is entered, should be a maximum of 24" in length and leaves graduated in size.
   b. Container-Grown Plants: Schedule must specify maximum container size. Sections may include Container Grown Foliage or Container Grown Blooming. Single/self multiple, or multiple planting of the same plant. Containers include hanging baskets as well as combination plantings, decorative pots, or other containers.

c. Arboreal: Cut branches of trees or shrubs. Cut specimens exhibited to demonstrate both beauty and utility of trees and shrubs in the landscape. The schedule should state maximum length of 30" from tip to cut end. Sections may include classes for 1) flowering branches, 2) branches showing beauty of foliage, 3) branches showing fruit/berries or cones. Examples: *Ligustrum, Euonymous*, variegated hollies (*Ilex aquifolium* 'Argentea Marginata' and 'Golden King'), some vines, *Rosa wichuraiana variegata* 'Curiosity', Aucuba.

d. Collection: Must consist of at least five different cut specimens, five different container-grown plants, or fruits, vegetable, or nuts. Fresh plant material may be: 1) one family (Begoniaceae), 2) plants with like characteristics (variegated!), 3) different types or species within a genus (*Hosta, Cornus*), 4) different cultivars within a genus or species (*Caladium*), 5) five different cut/container grown annuals, biennials, perennials, or sets of fruits, vegetables, or nuts, or 6) five different cut branches.

e. Display: Must consist of at least five different cut specimens, five different container-grown plants, or collections of fruits/ vegetables/ nuts. Fresh plant material may be listed as: 1) one family, 2) plants with like characteristics (variegated!), 3) different types or species within a genus, 4) different cultivars within a genus or species or 5) five different cut/container grown annuals, biennials, perennials, or sets of fruits, nuts or vegetables, or 6) five different cut branches.

f. The Petite Flower Show: Variegated miniature, dwarf or naturally small foliage can be entered and should be noted on the entry card. Some things to look for include: If **the tag** says it is a dwarf variety, then we go with that. "Sold to me as...". Just be sure you are not looking at immature growth. We want the small version of the large plant. Look for **the species name** (usually descriptive) to include the words "*nana*" or "*nanus*" meaning dwarf, "*minima*" meaning least or smallest, "*minor*" or "*minus*" meaning smaller, or "*minutus*" meaning very small. How about "*inconspicuus*", "*parvus*" or "*parvulus*" also meaning small? Other species names beginning with or including the prefix "*brevis*" which means short may also be considered if it refers to height. Have you seen a species name ""*pumilus*" or "*bumilis*" meaning dwarf or low growing? Additionally, **the cultivar name** may give you a hint as to size: 'Tiny Tim', 'Lilliput', 'Baby Doll', and 'Tom Thumb'.

D. What the Judges are looking for: The fair and objective assessment of each specimen. Do not let your color preferences affect your judging!

1. As **Foliage:** Probably the majority of variegated specimens in a flower show will be from foliage plants. Variegated foliage plants offer lasting color while flowers fade quickly.
2. As **Arboreal:** There is a wide variety of trees and shrub which feature variegated leaves.

3. As **Combination Plantings** A variety of leaf shapes, **foliage colors** and plant forms will lend interest, but too many colors and patterns destroy unity.

a. Dish garden: miniature landscape in an open container.
b. Planter: a group of plants grown in a container for artistic effect, either indoors or out.
c. Terrarium: a miniature landscape in a transparent container.
d. Trough: a naturalistic landscape in miniature

4. As **Collection**: Many gardeners collect variegated plants and add to their collection when new plants come on the market. Gardeners are drawn to the vibrant colors and know that these plants will provide color throughout the season or all year long.

5. As **Display:**

a. Exhibited for artistic effect as well as cultural perfection. Artistic effect and cultural perfection are equally important. Cultural perfection includes vigor, condition, typical growth habit or symmetry, substance, color, size, state of maturity and floriferousness if applicable.

b. Each cut specimen or container-grown plant is judged individually, then display as a whole is judged.

c. Correct labeling in an attractive, complimentary manner adds to overall display and its educational value.

Other consideration:

6. As Educational Display: "to further horticultural education"

Educational Value (60 points): interest to viewers (25 points), clear, concise presentation (15 points), adequate educational signs or tags (10 points), follows NGC objectives (10 points)
Staging (20 points): craftsmanship, technique (10 points) and distinction (10 points)
Creativity and expression (20 points)

2) Use in Designs: fresh or dry, adding contrast, interest, color

Optional Topic:

Native Plants and Wildflowers

Objectives:

To observe the similarities and differences among these families of plants.
To practice propagation techniques.
To learn the secrets of growing and showing award winning native plants and wildflowers.

References:

Florida Wild Flowers: An Introduction to the Florida Flora by Mary Francis Baker, 1976
Florida Wild Flowers and Roadside Plants by C. Ritchie Bell and Bryan J. Taylor, 1982
Wildflowers of Louisiana and Adjoining States by Clair A. Brown, 1972

Materials Needed for this Unit:

As many examples of wildflowers as possible.
Seeds, cuttings and soil mixes, containers and labels for propagation.

2013 was the Year of the Wildflower!

Wildflowers are one of Mother Nature's loveliest gifts. Their changing panorama of colors, shapes, sizes and heights provides delight throughout the seasons. Wildflowers can be used anywhere. In the home landscape they are ideal for creating colorful beds and borders, as well as offering a lower-maintenance alternative for large areas or replacing turf grass. Wildflowers can be planted to cover large, open areas or assist in the recovery of a landscape that has been damaged or destroyed by the actions of people, a natural disaster or the spread of invasive plants.

HISTORY OF WILDFLOWERS

Many of our favorite wildflowers have been growing in European gardens for centuries. Even some of our native wildflowers enjoyed more popularity in Europe than in the U.S. where they went unnoticed by gardeners. When early explorers came to North America, they discovered the bounty of plants growing in the New World. They eagerly brought many of these plants back to Europe where they were sought after by gardeners wanting something new and different for their gardens.

During colonial times, ornamental flowers were often grown in the Pleasure Garden or Pleasure-Ground, the designation for the flower garden. President George Washington had flower gardens at his home but most of his written notes were about the trees and shrubs he planted at Mt. Vernon, One native wildflower that Washington did plant and record was Cardinal Flower (*Lobelia cardinalis*). He probably grew many foreign or exotic flowers since Washington avidly collected and traded plants with correspondents in Europe.

President Thomas Jefferson, an avid horticulturist, plant collector and seed saver, grew wildflowers in his garden. He also noted planting Cardinal Flower after it was recommended by his nurseryman friend, Bernard McMahon, who included it in his 1806 book "The American Gardener's Calendar", the first horticultural reference for American gardeners. While Cardinal Flower may have been one of the first trendy plants in the New World, it's interesting that this North American native wildflower was introduced in Britain in 1626, more than 150 years

before being mentioned in American references. McMahon noted "Here we cultivate many foreign trifles and neglect the profusion of beauties so bountifully bestowed upon us by the hand of nature."

Other plants in Jefferson's garden may have been from the 290 native plants described and collected by Meriwether Lewis during the Lewis and Clark Voyage of Discovery in the early 1800's. More than half of the plants were new discoveries to white people including Lewis Flax (*Linum lewisii*) (one of many plant species named after either Lewis or Clark) and Scarlet Globemallow (*Sphaeralcea coccinea*). They also described Blanketflower (*Gaillardia aristata*) and Purple Coneflower (*Echinacea purpurea*).

Informal and wildflower gardens became fashionable with the publication of The Wild Garden in 1870 by England's William Robinson who described them as "a delightful feature of a place". This style of garden contrasted with the highly manicured and formal designs that had been popular in American and Europe. Wild gardens featured hardy, herbaceous plants, including both native and exotic species. They were designed and placed where they would thrive with little additional care.

The cottage and old-fashioned gardens of the 1800's also included a few native perennial wildflowers but mostly focused on designs that included peonies, hollyhocks, phlox, roses, violets and other European favorites. By the end of the 1800's many landscape designers began to emphasize hardy herbaceous plants in recognition of their lower maintenance. Noted horticulturist and botanist Liberty Hyde Bailey wrote, "The interest in native plants has never been so great as now."

Wildflowers and native plants have continued to attract attention throughout U.S. gardening history. They are currently experiencing a resurgence in popularity by both gardeners and public officials for their beauty and their valuable contributions to the environment.

Definitions: WHAT IS A WILDFLOWER?

Wildflower is not an exact term that is well defined. Some people say a wildflower is a plant that was not intentionally seeded or planted and grows without cultivation. Others classify a wildflower as any plant growing without the help of man regardless of the country of origin. Still others define a wildflower as a plant found in a specific geographic area that was grown from seed or plants also from that area.

Wildflowers and other plants that were growing before European settlement in what we now call the United States, Canada and Mexico are called **native plants or indigenous species**. Other plants, often referred to as exotics or aliens, were originally brought here from another part of the world. Many exotic species including flowers, grasses, trees and shrubs are among our favorite garden plants. A few, including some wildflowers, have escaped and become established as part of a local environment or naturalized. Some exotic species have even become invasive and are considered noxious weeds that need to be eradicated.

Uses: WHY PLANT WILDFLOWERS

A garden of wildflowers offers benefits to both the gardener and the environment. Once established, properly chosen wildflowers require less maintenance than traditional landscape plantings which can mean less watering, fertilizing, pest control and mowing. Some plants have deep root systems that prevent water run off and soil erosion, and enable them to withstand drought. Their growth also brings earthworms and beneficial soil microorganisms to enhance soil

health. And colorful blossoms can be arranged into lovely, casual bouquets that brighten the home.

Flowers provide nectar and pollen sources for bees, butterflies and other pollinators, while ripened seeds are a food source for birds and wildlife. Current research suggests that native plants and flowers might be more attractive to native bees than exotic flowers. Even a small area in a garden or landscape planted with wildflowers that bloom at varying times throughout the growing season helps attract and support pollinators.

HOW TO CHOOSE WILDFLOWERS

Before purchasing seed or plants, think about what you are trying to achieve with your planting. If you want only native wildflowers in your garden find out what is native to your region and what type of growing conditions are needed. Do you want to attract bees and other pollinators or encourage butterflies to visit your garden? Look for plants that produce the type of flowers preferred by these insects. Are you interested in a garden that is filled with color from spring to fall? Choose a mix that has a variety of flowers and bloom times.

Some wildflowers have very specific soil, water, light, temperature and fertility requirements and won't grow outside of a specific geographic range or set of conditions. Others are easier to grow because they have adapted to a wide range of environments. Does the plant like full sun, partial sun or a shaded location? Does it require constant moisture, or will the plant survive periods of drought during the year? Does the plant like rich, fertile soil or does it grow better in a poor soil with lower fertility? Choose plant varieties that are matched to the conditions of your site.

Many types of wildflower mixes are available from seed suppliers. Some mixes contain only native wildflowers and may be formulated to grow in a defined geographic region or climate. Other mixes contain varieties that are both native and exotic. Some mixes have a balance of annual and perennial species to provide fast color and long-term beauty. Other mixes contain mostly annual flowers for a quick-growing wildflower garden. Not all of the wildflowers contained in mixes will grow in every garden but there are usually enough different types in each mix to provide a nice variety. Remember that successful wildflower gardens are created over many years as plants that are best adapted to your garden conditions become established and thrive.

There are many sources available to help you find the best native wildflowers for your garden. The Xerces Society (www.xerces.org) has several fact sheets and publications that suggest good native plants for geographic regions in the U.S. The Lady Bird Johnson Wildflower Center has an extensive database of commercially available native plants that can be searched to provide recommendations by state (www.wildflower.org). Local native plant societies and government organizations are also good sources of regional information.

PREPARING THE SOIL

The next step in creating an eye-catching field of flowers is to prepare the soil by removing weeds and other unwanted vegetation. If the soil is compacted, till lightly so the soil is loose and germinating seeds can put down roots. A bow rake is great for loosening the top layer of soil. Digging or roto-tilling too deep will bring up weed seeds and other plants that will need to be removed later to avoid competing with the wildflower seeds. While it may not be practical or necessary to amend the soil before planting wildflowers, you can add organic matter such as compost or well-rotted manure before planting depending on the site.

PLANTING FROM SEED

Wildflower seed and seed mixes can be planted in either spring or fall. Spring rains help seeds germinate and plants get established before many weeds have a chance to grow. In warm climates, fall is a good time to plant wildflowers when cooler temperatures and winter moisture provide better conditions for seed germination and growth. In cold climates, a dormant seeding of wildflowers can be done in the fall when temperatures are low enough that seed will not germinate until weather warms up the following spring, similar to what happens in nature. Some seeds, especially many of our native perennial wildflower species, need a chilling period to break their dormancy. This is provided naturally by the change in temperatures from winter into spring.

Scatter seeds by hand or with a small spreader. Seeds can be raked into the soil or lightly covered with soil. Water thoroughly right after planting and keep seeds and seedlings moist for about 4-6 weeks. Gradually reduce watering as seedlings develop. Identify and remove weed seedlings as soon as possible since they will compete with wildflowers for water, nutrients and space. For dormant seeding, watering after planting seeds is not necessary.

CARE OF THE WILDFLOWER GARDEN

A wildflower planting just like a colorful meadow created by Mother Nature will look different from month to month and year to year. Annual flowers are more abundant at first because they grow and flower quickly. In following years perennial plants become established and start flowering, in addition to annual flowers that may reseed themselves.

The first year is a time to help wildflowers get established. Not all seeds will germinate right away but may be waiting for the right environmental conditions before they begin to grow. This is especially true with perennial wildflowers so don't get discouraged or be disappointed if you don't have that instant flower meadow. For more immediate results you may want to combine seeding wildflowers with planting a few container-grown plants. Plants will quickly get established and compete with weeds that may appear. Be sure to identify and remove weeds when they are small to prevent them from spreading Depending on needs of your wildflowers provide additional water if rainfall is sparse, especially during periods of extended hot temperatures. Avoid cutting flowers after they bloom so they can go to seed. Seed will drop to the ground and spread to fill in your planting.

During the second year, you may see new plants grow from seeds that didn't germinate the first year. Water if rainfall is not adequate, especially in the spring. Additional water may be needed in the summer during extreme or extended periods of hot weather. Continue to remove weeds as they appear. As wildflowers become established the need to weed should taper off. Fill in bare spots with additional seed or container-grown plants.

After the third year and beyond your wildflower planting should require minimal maintenance. Remove large weeds that may move in. You may want to move plants that have grown too close and are crowding each other. Use them to fill in bare spots or sow additional seed to cover those spots. Additional water may be needed in the summer during extreme or extended periods of hot weather. Fertilizing is generally not required. In a garden setting, you can mulch around established plants with compost or well-rotted manure. Cutting or mowing wildflowers in fall to a height of about 6 inches will keep the planting looking neat and help spread seeds. Periodically disturbing the soil by digging or raking can also help regenerate a wildflower garden by creating good soil contact with seeds that have fallen to the ground.

Some wildflowers, especially prairie plants and grasses, benefit from being burned every few years. Fire occurs in many ecosystems as a way to get rid of woody plant invaders that move into a site as part of natural plant succession. Fire also helps break the dormancy of some seeds and stimulates the growth of other species. However, burning should only be done by someone with the understanding and expertise to do it safely and effectively. In the home landscape mowing, hoeing, digging and other means of soil disturbance can achieve the same goal.

WHERE TO BUY WILDFLOWERS

Gardeners have many choices when creating a wildflower garden. Local nurseries and garden centers sell both seeds and live plants. Retail, Internet and catalog seed companies sell wildflowers as individual species and mixes. Many seed companies also sell mixes for a variety of special uses—wildflowers for cutting, fragrance, partial shade, attracting butterflies or pollinating insects, and more.

Digging plants from the wild is not recommended and might be illegal. State and federal laws protect some native plant species that are threatened or endangered. Collecting seed must be done carefully. Removing too much seed could reduce or destroy a wild plant population.

SOME POPULAR WILDFLOWERS IN FLORIDA:

First, our state wildflower!! *Coreopsis lanceolata* is one of 15 species of *Coreopsis* found in Florida. Some folks refer to this plant as "Lance-leaf" Coreopsis. It is a perennial growing to 2 feet tall in height, with bright yellow, 1-2 inch blooms in spring, summer and fall. This particular species features slightly hairy, small leaves, mostly in a rosette near the base of the plant. These plants need only a minimum of water to perform and thrive. You will notice that this plant is frequently used in roadside plantings along our interstates and by-ways.

This plant reseeds freely but if you prefer, plant purchased seeds in November, December or January in full sun. Prepare a seed bed or mow grassed areas very short, leaving the clippings. Broadcast seed evenly over the area, and lightly rake to ensure seed-to-soil contact. Moisten or leave watering to nature. Maintain like an old-fashion flowerbed or leave alone. Mow in October and November after seed has dried. In a short time, you will have plenty of plants to share.

"Joe Pye Weed" *Eupatorium purpurea* and now has a new name *Eutrochium.* A member of the Asteraceae family. Blooms late summer into fall (July to September).

Called "Joe Pye weed" after Indian healer from New England, Joe Pye, who used this herbaceous plant to cure many ailments including typhus.

Generally large plants with big domes of small flowers, clusters of small purplish tubular disk flowers, that are rich in nectar and pollen, attracting butterflies especially Monarchs. Bumble bee pollinated. Native alongside the highways and kin to the Wild Ageratum and Mist Flowers. A perennial up to 10 feet tall on stems that are purplish and hollow. Leaves are 4-7 inches long and whorled around the stem. Flower clusters are in a panicle and are also whorled. Also available in a dwarf cultivar called "Little Joe", and "Chocolate" Joe Pye Weed with white flowers and purple-brown stems. The hybridized form 'Gateway' has a deeper purple dome of flowers. You may also hear of it as "Spotted Joe Pye Weed" (*Eupatorium maculatum*) which has purple spots on its green stems, a slightly smaller plant.

Easy care needing 6 hours of sun and almost any soil type and regular water.

Tulip Tree or Tulip Poplar, *Liriodendron tulipifera*, is a deciduous tree belonging to the Magnolia family. It is native and grows fast to 60-90 feet tall with a conical spread of about 35-50 feet. Leaves shaped like a blunt ended, lobed, maple leaves, they turn bright yellow in the fall and can be 4-8 inches in length.
Tulip-shaped flowers 2 inches wide bloom in late spring and are a greenish yellow with an orange mark at the base. Not showy on the tree since the flowers are usually so high up. Trees need to be mature to bloom (10 years+).
Needs full sun and a deep, rich, well-drained, neutral to slightly acid soil. Has shallow fleshy roots that are difficult to garden through. Propagates easily by seed.
There is a hybrid with yellow-edged leaves 'Aureomarginata' (sold as 'Majestic Beauty'). A more columnar and smaller version 'Arnold' (also known as 'Fastigiata') is also available.

Ageratum "Mist Flower", Eupatorium
"Wild or Hardy Ageratum" sometimes called "Mist Flower" –*Eupatorium coelestinum* (Syn *Eupatorium incarnatum*) A native plant in the Asteraceae family reaching 3 feet tall with branching stems. This perennial, vigorous, free spreading (read invasive in fertile soil) plant bears broad clusters of fluffy blue flowers in the fall that exactly resemble the annual, "Floss Flower" or *Ageratum houstonianum*. Flowers are composite in composition with disk and ray flowers forming a head rich in nectar and pollen. Leaves are in opposite pairs, toothed, dark green, triangular shaped, and up to 3 inches long. There are some hybrids of this plant such as 'Album' with pure white flowers and 'Cori' with exceptionally clear blue blossoms blooming later in the year and 'Wayside Form' a compact plant growing to only 15 inches. This plant is kin to the "Joe-Pye Weed", *Eupatorium purpureum*

"Goldenrod"-*Solidago*—Many types of native Goldenrod species exist in our area. Along the dry, pineland roadsides you may see the perennial herb, *Solidago fistulosa* with rough, elliptic leaves about 4" long and hairy stems to 6 feet tall. These have tough, woody, spreading rootstocks. Closer to the beaches you will find *Solidago sempervirens* or Seaside Goldenrod with stems to 8 feet tall and spoon-shaped basal leaves. All the Goldenrods are in the Asteraceae family featuring the disk and ray flowers with yellow heads of many small, one-sided racemes in terminal panicle. It was thought that Goldenrod caused Hay Fever but it is actually another plant blooming in the fall that causes this condition, Rag Weed. Many hybrids are available on the market showy plumes of bright yellow flowers. Look for 'Cloth of Gold', 'Crown of Rays', 'Golden Baby', 'Goldenmosa', 'Gold Spangles' and a dwarf selection called 'Laurin'

Liatris elegans or Liatris spicata-"Spike Blazing Star" or "Gay Feather"—perennial herb from a small corm. Flower cluster a spike-like raceme up to 2 feet long. Flower heads purple or white and flowers open from the top down the stem. Butterfly attracting but also favored by deer.

Native Vines Yellow Jessamine (NOT Jasmine) or *Gelsemium sempervirens* is a high-climbing twining, woody vine with slender, wiry stems and evergreen, opposite lance shaped leaves. The fragrant yellow trumpet flowers are about 1 inch in diameter producing an oblong ¾" capsule of seeds. Common in thickets, clearings and the coastal

plain areas of the southeast. Blooms in early spring, late winter. Has a distinct smell when cut.

Ipomea coccinea (Scarlet Morning Glory) and *Ipomea quamoclit* or Cypress Vine: Both are vigorous annual vines whose tangled stems twine over the adjoining vegetation. The Morning Glory is an essentially unlobed crimson flower with ovate, angular, entire leaves about an inch long while the Cypress vine has pinnately dissected leaves. Widely naturalized in Florida and much of the USA, these weedy but colorful vines may be found along railroads, fencerows and in gardens and waste areas. A tropical vine.

Passiflora incarnate (Maypop or Passion Vine) is a perennial vine that climbs by means of tendrils and spreads by underground stems (hence the name "Maypop" as it may pop up anywhere!). The leaves are alternate, deeply 3-lobed with 2 conspicuous glands at the summit of the petiole. The beauty of the flower is not only in the colors of the floral parts but also in the delicate arrangement of parts. The flower is about 3" in diameter and has reflexed, green sepals, 5 yellowish green petals, a mottled purple and white fringe, 5 drooping yellow stamens suspended around the pistil which has 3 to 4 reflexed stigmas and a conspicuous ovary. The edible fruit is a green berry, oval shape, 2-3 inches long. Widely distributed in LA, TX, AR, MS and Florida. Blooms May to September.

Passiflora lutea (Yellow Passion Flower) is a perennial vine with slender, tender stems, high-climbing with tendrils and spreading by underground stems. Leaves are thick, broader than long, 3-4 inches wide, obtusely 3-lobed at the apex. Flowers are yellow green, nearly and inch in diameter featuring short stiff, yellow fringe at the edge. Fruits are drooping, fleshy berries about ¼ inch in diameter. Widely distributed but not common, found in thickets along streams. Blooms May into July.

Wildflowers for Spring and Summer:

Verbena tenuisecta (Moss Verbena)

A weedy but colorful tropical introduction (naturalized), this Verbena is often abundant on roadsides and in clearings and waste areas from South Florida into coastal plain of the Carolinas and Texas. The stems of these spreading or prostrate perennials root at the nodes, and a single plant may form a clump a meter in diameter—forms low, dense mats with short erect, terminal, purple flower clusters. The small ovate or triangular, opposite leaves are divided into many linear segments. You should be seeing this all along the roadside and in parking lots.

Daubentonia punicea (syn *Sesbania punicea*) "Red Rattlebox"

A widespread but not frequent introduced perennial established along roadsides, ditches and waste places of the coastal plain from central and northern Florida to Texas and North Carolina.

The seeds in the persistent, four-winged legumes rattle when the stalks are shaken, giving it the common name. Shrub-like, 4-8 feet tall. Leaves pinnately compound, 8-10 inches long. Leaflets 12 to 40 about 1 inch long, linear-elliptic. Flower cluster drooping and densely flowered. Standard dark red to orange-red, about 1 inch wide. Reported as an escape from cultivation.

Saururus cernuus "Lizard's Tail"
Very common and abundant in wet sites, cypress swamps, usually in standing water. An aquatic perennial, colony-forming herb about 3 feet tall with extensive rhizomes. Leaves alternate, petioled. Leaf blades about 6 inches long, cordate (heart-shaped) to broadly ovate, distinct converging veins. Flower cluster slender raceme, nodding or trailing at tip, blooming from base upward. Flowers white, crowded, no perianth.

Other Wildflower favorites:

Spiderwort, Trinity flower: *Tradescantia virginiana*: Perennial herb, old fashioned, long lived plant. Coarse textured, deep green foliage, lance shaped leaves, arching...grass like looking. Three petal terminal cluster blooms in shades of blue and purple and rarely, white. Clumping habit to 16" tall. Cut back to the ground in July for repeat summer blooms. Now hybridized varieties for larger blooms and rich purple, pinks and red colors. Prefer slightly acid to neutral soil that is moist and well drained but very adaptable. Sun or light shade. Bee and butterfly attracting. Will reseed and can become invasive.

Wild Petunia: *Ruellia caroliniensis*: A perennial herb about 12" tall. Leaves opposite and ovate and about 4" long. Flowers are trumpet shaped, visually bluish, photographs purple and rarely white... readily shed when picked.

Florida Leucothoe: *Leucothoe populifolia*: Shrub, evergreen, native to the south. Problem free, sculptural shape—upright and arching. Fast growth Foliage is light olive green, alternately arranged to 5" long, and in spring, clusters of tiny white flowers, like bells, are found under the leaves. Understory planting in part shade best. Likes moist, well-drained soil rich in organic matter. To 12 feet tall and wide. Several hybrids now on the market including *Leucothoe fontanesiana* or the Drooping or Weeping Leucothoe and *Leucothoe axillaris,* a dwarf variety.

"Stokes' Aster" or *Stokesia laevis* is a perennial native wildflower found in many of the ditches along the by-ways in Escambia County and District I. Its shaggy purple composite flower (a central button of small florets surrounded by a ring of larger rays) is held aloft on a branched stem from its evergreen basal rosette of 2-8 inch leaves that have a faint white cast down the mid-vein. The native plant is very rugged and adaptable but would be very happy with regular water and full sun. It is not unusual to have blooms from May to September. This plant has been hybridized in the plant industry and now several named cultivars are available, and the flowers range from deep purple, powder blue, lemon yellow to white. Look for names like "Blue Danube', 'Bluestone', 'Purple Parasols', and 'Silver Moon' among others.

Pinelands hibiscus: *Hibiscus aculeatus*: A perennial herb with annual ascending to erect stems to 3 feet tall. Leaves alternate, palmately 3-5 lobed, about 2-4 inches long, irregularly cleft, with large sinuses between lobes. Stem and foliage densely covered with trichomes, which feel rough to the touch. Flowers 2-3 inches wide, funnel-shaped, dark center, corolla yellow, turning purplish with age. Capsule about 1 inch in diameter, densely hairy. Confined to low, moist pinelands, along ditches, sloughs, wet sites. Bloom May to September.

Orange or Butterfly Milkweed: *Asclepias tuberosa*. Herbaceous perennial, stems ascending to erect 2-3 feet tall, strongly hairy. Leaves lanceolate, 2-4 inches long, nearly sessile, bright green above and slivery pubescent below. Flowers complex, reflexed sepals and petals, bright orange or yellow, erect hoods and horns in many flat-topped clusters on side of stem. Widespread in the drier upland soils. Difficult to transplant. Propagated by root cuttings and by seed. May to July bloom.

Ti-ti: *Cyrilla racemiflora*. Semi-evergreen shrub or small tree with attractive lustrous/shiny, alternate, obovate/elliptical leaves from 2.5 to 5 inches long, bearing numerous showy, sub-terminal racemes (drooping or spreading) of tiny (1/4") white, closely spaced flowers. "Leatherwood", as this plant is also known, is frequent in swamps, low woods, and stream banks, throughout Florida and on coastal plain. A very good honey plant. Blooms April to June.

Bull Nettle, Stinging Nettle, Tread softly: *Cnidoscolus stimulosus*. Herbaceous, rhizomatous, monoecious perennial covered with stinging hairs. Plants up to 24 inches tall. Leaves palmately 3-5 lobed with margins entire to slightly dentate, alternate. Fragrant flower cluster terminal, composted of staminate and pistillate flowers. Perianth of staminate flowers white, salverform, about 1 inch across with perianth tube about 1 inch long. Pistillate perianth quickly deciduous, ovary developing into 3 lobed capsule. Bloom May to July.

Native Ferns:
Bracken Fern: Ptridium aquilinum
Resurrection Fern: (Polypodium polypodioides)
Royal fern (*Osmunda regalis*)
Southern Wood fern or Shield Fern:
Cinnamon Fern: Cinnamon fern (*Osmunda cinnamonea*)
Woodwardia

Native **American Hollies**: Hollies are all **Dioecious**: separate male and female plants. Shrubs or trees provide cover and food for birds.
A. *Ilex opaca* (American Holly): on the conservation list due to indiscriminate cutting for Christmas boughs. Evergreen tree native to eastern USA. Slowly grows to 40-50 feet tall, 20-40 feet wide, densely pyramidal when young, then becomes open, irregular and picturesque with age. Spiny green leaves reach 2-4 inches long, may be glossy or dull. Show some bronzing in winter. Red berries. Site in a wind-protected spot. Subject to many pests, with leaf miner being perhaps the most troublesome. Rarely bothered by deer.
Ilex glabra (Inkberry): Stolons. Coastal native to eastern North America. To 10 feet tall and wide, with thick, spineless dark green leaves to 2 inches long (leaves turn olive green in winter). Berries are black. Grows in sun to partial
Ilex vomitoria (Yaupon): Black drink called Cassena brewed from leaves. Drought and salt tolerant. Evergreen shrub or small tree. Native to the South. Grows in almost any soil. Good plant for the beach: tolerates salt spray. Grows to 15-20 feet tall with narrow, inch-long shallowly toothed, spineless leaves dark green leaves. Can be grown as standard or sheared into columnar form—good topiary plant. Tiny scarlet berries are borne in profusion. Resists damage by deer.

Ilex cassine (Dahoon Holly): on conservation list. Native to swamps and moist lowlands from NC to FL and A. Dense, upright habit to 20-230 feet tall and 8-15 feet wide. Leathery medium green leaves 2-4 inches long, toothed only at the tips. Heavy crops of small berries in red to reddish orange (sometimes nearly yellow). Grows naturally in wet, acid soils, tolerates mild alkalinity and has some salt tolerance. Regular ample water.
Ilex decidua (Possum Haw): deciduous, found along streams. Native to the southeast. To 6-10 feet tall possibly to 20 feet tall. Pale gray stems, shiny dark green leaves to 3 inches long. Orange to red berries last into winter or spring.
Ilex verticilliata (Winterberry or Blackhaw, Black Alder)Deciduous shrub native to swamps of eastern North America. Unlike most hollies, this one thrives in boggy soils, but it will succeed in any moist, acid, organic soil. Species and most selections grow 6-10 feet tall and wide, eventually forming clumps by suckering. Dark green , oval leaves to 3 inches long may turn yellow in autumn. Female plants bear enormous crops of bright red berried that ripen in early fall and last all winter. Plant one male plant for every six females.

Holly Cultivation:

A. Soil—Hollies grow well in fully drained, light and sandy soil with a somewhat acidic pH between 5.0 and 7.0. Several exceptions that like wet soil.

B. Light—Most hollies grow and flower best with partial shifting shade but in the south, some do well in bright light conditions.

C. Water—moderately- may go dormant during times of drought.

D. Temperature—Depending on variety, will grow just about anywhere.

E. Fertilizing: Hollies are heavy feeders. Fertilize with a slow release organic fertilizer with bone meal or superphosphate, such as 10-6-4 during the growing season or use inorganic fertilizer such as Osmocote. Best to fertilize in mid-March—not summer or fall. Hollies are shallow rooted so feed 1/3 application inside the dripline and 2/3 application outside the dripline. Use 1 pound of fertilizer for every inch of trunk diameter.

Holly Maintenance: Mulch well (2 to 3 inches) to protect shallow root system and to conserve moisture. Pruning may be done after bloom or at any time during the year including late spring to early summer, but best at Christmas, when dormant. Prune to shape and control size, open for circulation in interior for better pollination and light, increase fruit production, rejuvenate, train into leader, remove dead, damaged, or diseased branches. Also prune for formal shaping such as geometric shapes. Large cuts should be made flush with trunk. Prune to proper bud to indicate direction of growth. Used as topiary and Bonsai. Note: Hollies do not like to be transplanted!

Holly Propagation:

A. Asexual propagation by:

1. Cuttings: Will come "true" to parent. Use an active, live twig of the current season's growth—ensure mature with dark green leaves. Take cuttings in mid to late summer. Cutting can be small but 10 to 14 inches is preferred. Note position of growth on parent. Remove the bottom 1/3 of leaves. Make a wound by slicing outer bark and cambium. Dip end in root hormone powder. Put in rooting medium of 1/2 sand or Perlite and 1/2 damp peat moss. Plant 3 to 4 inches deep. Cover for humidity or mist. Needs good drainage. Heat roots if possible, to 72 to 75 degrees.

2. Root Cuttings: take roots the size of a pencil. Insert in rooting medium so only the tip shows.

3. Budding and grafting: Cut into stock and place scion in. Can be used to put male and female on same bush. Can be used to have 2 or more colors of berries on same plant.

B. Sexual propagation by seed: Flowers usually bloom in April, May or June depending on species. The fruit is a berry-like drupe. Only female plants produce seed. Gather berries when mature. Crush and wash the pulp away, discard floating seeds. Some varieties have hard seeds that may require a year to 18 months to germinate—Most germinate sooner. Place seed in mixture of peat moss and sand in baggy. One source says to refrigerate for 3 months before planting. Used to propagate species or wild types. Not variety specific.

Holly Diseases and Pests: Minor problems from Scale. Use horticultural oil to control. Minor problem with leaf miners, Aphids, Mealybugs (Isotox or a miticide). Fungus causes Holly tar spot, mildew, blight, rush and scab.

Wild Bergamot (*Monarda fistulosa)* Also called Beebalm, the whorls of pink to lilac colored flowers open in summer to attract bees, hummingbirds and a variety of other pollinating insects. It gets the name Wild Bergamot from the aromatic leaves that have a scent reminiscent of the bergamot orange tree of Europe. Monarda had many medicinal uses to the Native Americans. Today the leaves are often used to make tea. Plants do best in dry open areas and woodlands but can grow in moist soils as long as they are well drained. (Zones 3-9)

Eastern Columbine (*Aquilegia canadensis*) despite its species name is native to the East and Midwest U.S. as well as eastern Canada. It is one of about 30 species of Columbine found in North America. Columbine is often found in a shady woodland setting though they have a deep taproot that enables them to grow in dry sites. The colorful red and yellow flowers that open in spring and summer are a favorite of hummingbirds. (Zones 3-9)

Indian Paintbrush (*Castilleja sp.*) is another much admired wildflower that seems to grow without care in its native environment that ranges throughout North America depending on the species. It derives its name from the striking orange-crimson spikes that appear in spring and resemble a brush dipped in paint. However, Indian Paintbrush can be difficult to grow from seed and establish in the garden. They are considered hemi-parasitic which means they need to grow in close proximity to other wildflowers and grasses. Indian Paintbrush produces roots that attach themselves to a range of plants that grow nearby to obtain some nourishment. Without these host plants, Indian Paintbrush declines and eventually dies.

What the judges are looking for: Ensure the schedule for the flower show includes classes for native plants and wildflowers. Many do not. Ensure your specimen is correctly labeled and grown by you (not just picked from the roadside!). Ensure the flowers are fresh and undamaged. Ensure the specimen is long enough to show natural growth and form.

May be displayed as a single flowering annual or perennial, as an ornamental grass, as an arboreal branch, as an herb, depending on its designation in your reference books. Native plants can be used in combination plantings or entered in a Collection or Display of plants. It is always a good idea to enter your native plants as an Educational Exhibit to inform the public about the wonderful plants.

Contract to Teach Florida Horticulture Study Series

Club name:_____

Course Chairman:_____
Address:_____
Telephone:_____
Email address:_____

Instructor:_____,

This is to confirm the date of _____ for you to instruct unit number _____ of the Horticulture Study Series to be held at:

Place:_____Begin time:_____End time:____
Address:_____
Directions if needed:

We agree to pay the following:
Instructor's fee: $100 for each 4 -hour course (or $25 per hour)
Mileage: 35 cents per mile each way
Meals: breakfast, lunch and dinner one each per day, if needed and bill presented
Plant materials: up to $35 per course for samples, if needed and bill presented.
Lodging for one night, if needed:
Lodging Preference: Private home_____or Hotel_____

Please confirm this agreement by signing this copy and return to the above chairman in the envelope provided. Thank you! We look forward to seeing you soon.

Sincerely,

Chairman, Horticulture Study Course

Signed:_____
Instructor, Horticulture Study Course
Date:_____

Instructor's Outline Format for Plants to be Studied

Note: A number of outlines for specific plants already exist for your use. Just call the State Horticulture Study Chairman for a list or copies. If you develop an outline for a plant not already developed and on file with the chairman, it is expected/hoped that you will share it with all course instructors at the next refresher training meeting, if not before.

When creating an outline for a specific plant, please use this format in its development.

1. **Definitions**: define any and all terms associated with the plant type or family. The glossary of the *Handbook for Flower Shows* will be the primary source for all definitions. If possible, please use the books listed as required reading for the Horticulture portion of Flower Show School to develop your specific plant outlines. Include botanical nomenclature and what the name means.

2. Uses: consider where and how this plant can be used: inside or outside in a container, outside in the landscape, how it is to be used in the landscape, benefits of growing this plant, etc.

3. **Growing and Showing**: examine the best site for the plant (sun or shade), how to best prepare the site for planting, how to choose the best plant at the nursery, how to condition, prepare or groom a cut specimen or container grown plant for the flower show. According to the flower show schedule, where would the plant be entered and placed? Do you know the full botanical/cultivar name? How best to transport the specimen? What awards the specimen might be eligible for. What the judges are looking for, etc. (go over the qualities listed on the appropriate point scoring form, explain the Standard System of Awarding).

4**. Propagation**: discuss and demonstrate the sexual, vegetative and asexual ways this plant may be propagated.

5. **Maintenance:** What do we have to do to keep this plant in top shape in our landscape or in the home? Include methods of pruning, pinching, deadheading, and reasons why they are necessary, when to prune. Discuss the benefits of mulching. When and how to fertilize, spray, etc. Is staking necessary?

6. **Pests and Diseases**: What are the insects, virus, bacteria that plague this plant? Prevention: emphasize the need for good gardening practice. Emphasize the use of integrated pest management (IPM) practices: natural methods vs. chemicals.

"Digging It" Student Note-taking Form

Type of Plant Studied: _____
Botanical Name:
Genus_____Species_____
Common
Name:_____
Family:_____Other
relations:_____
Varieties or Cultivars and
Hybrids:_____

Cultivation/Environmental:

1. Soil:
2. Light:
3. Water/Humidity:
4. Fertilizer:
5. Temperature:

Propagation:

Maintenance:

Pests and Diseases:

Horticulture Study Course Evaluation

Course #_____ Date_____ Location:_____
Instructor_____

Please share your comments on this course so that we may continue to improve programs and better meet your needs:

Content: Did the course of instruction and student outline contain the information you expected and needed to know?

Materials: Were sufficient examples, visual aids, and supplies available so that each student could fully examine and experience the concepts being discussed?

Organization: Was the course of instruction logically organized and presented, building on your prior knowledge and skills?

Presentation: Did the instructor appear to be prepared, knowledgeable, and familiar with the course materials so that the presentation flowed well and all questions were fully answered?

Facility: Was the facility conducive as a learning environment and appropriate to the needs of the course? Lighting, temperature, restrooms, parking, and comfort of chairs, etc.

Comments: Please add your comments on the overall course of instruction, instructor, or committee preparations. What did you like the most and what did not suit your needs?

Optional: Evaluation completed by: _____
I wish to discuss noted problems; contact me _____

Student Roster (excel spreadsheet)

Sample Budget for Horticulture Study Courses

Estimated Income:

Student course fee: (charge per course or one fee for all 10 courses). Recommend no more than $20 per student per course.

Ways and Means/ plant sale (the more you have to sell, the more money you can make)

Luncheon (optional but additional fee of approximately $5 per student per course).

Coffee and morning snacks (optional or can be included in course fee)

Estimate Expenses:

Instructor and guest speaker fee: (not more than $100 per course, or $25 per hour)
Instructor mileage: (recommend not less than 35 cents per mile)
Instructor accommodations: (hotel or home as indicated)
Instructor meals: (while traveling and during instruction)
Student Certificate fee ($1 per student upon completion of all 10 courses)
Course horticulture samples/examples
Student handout duplication
Postage
Rental of facility and set up

Registration for Horticulture Study Courses

(Note: Courses may be registered individually or in their entirety as needed)

Name of Club_____District_____

Chairman's name_____
Chairman's address_____

Facility/Location_____

	Date	Instructor
Course 1: Introduction (required) (Must be taught first)	_____	_____
Course 2: Annuals (required)	_____	_____
Course 3: Perennials (required)	_____	_____
Course 4: Trees and Shrubs (required)	_____	_____
Course 5: Bulbs (required)	_____	_____
Course 6: Containers (required)	_____	_____
Course 7: Vines (or optional topic)	_____	_____
Please specify title of optional topic	_____	
Course 8: Fruits, Nuts & Vegetables (or optional topic)	_____	_____
Please specify title of optional topic	_____	
Course 9: Herbs (or optional topic)	_____	_____
Please specify title of optional topic	_____	
Course 10: Cacti & Succulents (or optional topic)	_____	_____
Please specify title of optional topic	_____	

Please mail this registration form to the State Horticulture Study Chairman as noted in the current BOI.

Florida Federation of Garden Clubs, Inc.

Emblem

Certificate of Achievement
Awarded to

_____

For completion of

Florida's Horticulture Study Course

"Digging It"

President_____

Date_____

Chairman_____