

Landscape Plant Materials

HORT 308

Spring 2012

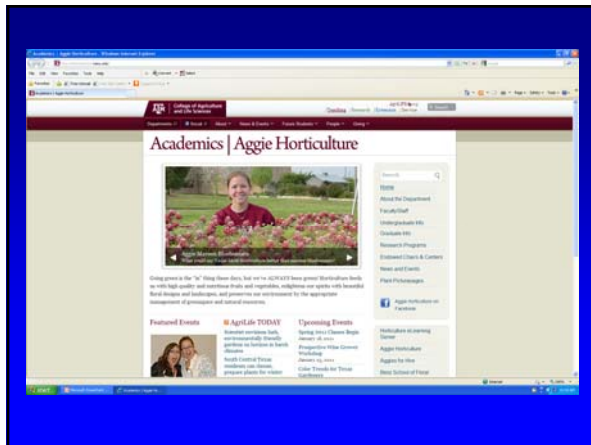
General Terminology and Definitions

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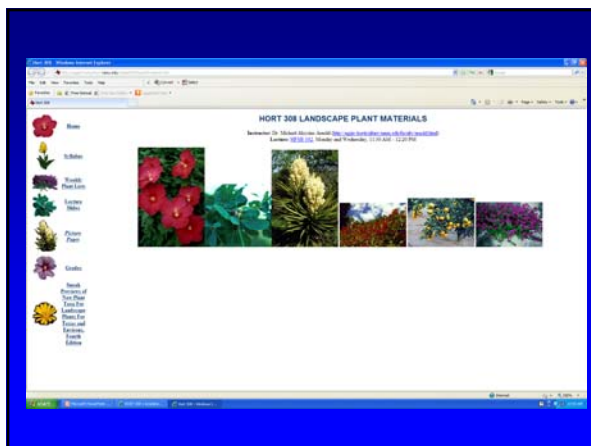
Instructors

- **Course instructor**
 - Dr. Michael Arnold
 - Office hours 10:30 to 11:30 Monday & Wednesday
 - Teach lectures and coordinate labs
- **Tuesday 10-Noon**
 - Mr. Andrew King
 - Office hours announced first week
- **Tuesday 1:00 - 3:00 pm & 3:00 - 5:00 pm labs**
 - Mr. Sean Carver
 - Office hours announced first week
- **Wednesday 1:00 - 3:00 pm & 3:00 - 5:00 pm labs**
 - Mr. Kirk Laminack
 - Office hours announced first week



Lecture Examinations (HORT 308)

- **Lecture portion of class = 1200 pts = 50%**
 - All materials are cumulative, emphasis on recent
- **Lecture exam 1 250 pts**
 - Monday February 20, 2012, in class
- **Lecture exam 2 250 pts**
 - Monday, March 26, 2012, in class
- **Lecture quizzes 200 pts (10 at 20 each)**
 - Unannounced (pop quizzes)
- **Lecture final 500 pts**
 - Monday, May 7, 2012, 10:30 AM - 12:30 PM



Laboratory Examinations (HORT 308)

- **Laboratory examinations = 1200 pts = 50%**
 - All laboratory materials are cumulative
- **Laboratory quizzes 900 pts (9 required of 11)**
 - Weekly beginning second week of classes
 - ID & scientific & common names of 10 plants each
 - Cuttings or potted plants indoors
 - Occasional bonus plants
 - Save makeups for illness / schedule conflicts
- **Laboratory Final (300 pts)**
 - 30 cuttings or potted plants each, all indoors

Textbook

Arnold, M.A. 2008. Landscape Plants For Texas And Environs, Third Ed. Stipes Publ. L.L.C., p. 1334.
ISBN 1-58874-746-8 (written especially for HORT 306/308/608 courses)

On-line availability

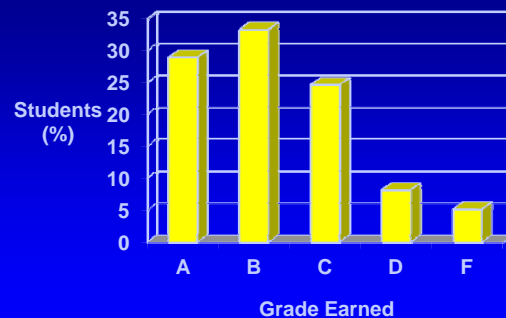
<http://www.stipes.com/horticulture.html>
<http://amazon.com>

Local availability:

A&M bookstore (MSC)
Traditions (Rothers)
Loupots
Texas Aggieldand



■ 15 Year Averages



Expectations:

- Grades are earned, not given
 - Results based grades, effort only matters when “on the bubble”
 - My approach is that a grade certifies demonstration of a given level of mastery of the subject matter
 - A – demonstration of an exceptional understanding and mastery in the material which is well beyond what is required
 - B = above average competency and mastery of the material
 - C = average understanding of the material
 - D = very minimal understanding of the material
 - F = unacceptable demonstrated level of competency in the subject matter
- Cheating & Plagiarism
 - *****WILL NOT BE TOLERATED!!!****

Miscellaneous

- Attendance is mandatory
- Labs meet at classroom in HFSB 110 (default location) or at the NFFL at the TAMU Horticultural Gardens off Hensel Drive
- Those with special needs, visit with me asap
- Bonus point opportunities
 - Exams & quizzes
 - Plant materials game days
 - Other in-class activities
- Recording of lecture or laboratories is not permitted
- Use of electronic devices is not permitted in class or labs (except camera for plant images only in labs)

Final Class Average for Last 5 Years

Year	Average grade
2007	78.4%
2008	79.8%
2009	77.2%
2010	79.0%
2011	79.9 %

Study Hints:

- GO TO CLASS & LABS!!!
- Learn plants as we go
- Review lecture slides (important for lecture exams)
- Review lab images / plant picture pages
- Review plants from past labs as seasons change
- Make flash cards
- Make lists
- Pay attention to family names
- Organize a study group
- Study specimens in timely manner

Plans for the first couple of weeks

- First 3-4 lectures
 - First 4 lectures are optional for those whom have passed HORT 306, required for others
 - But material will be on exams for all
- Fourth or fifth lecture begin Tropical & Subtropical Plant Discussion followed by Cacti and Succulents, then ... rest of the 11 lists
- Schedule of topics is on website



Woody versus Herbaceous (somewhat arbitrary)

Woody

- Above ground portions often do not die to ground each year
- Perennial
- Secondary growth, usually from a vascular cambium
- Size variable, but many retain >20' heights
- Environment dependent, especially cold

Herbaceous

- Above ground portions die to ground each year
- Perennial, biennial, or annual
- May or may not have secondary growth
- Seldom exceeds 20' tall
- Environmental dependent

Reading Assignments

Pages 1-34 in *Landscape Plants For Texas And Environs, Third Edition*
&
Syllabus (lecture quiz 1)

(Note: Lecture exam bonus questions will come largely from the assigned readings)

Trees

- Perennial
- Woody, generally upright growth habit
- Single or multiple trunks
- > 4 to 6 in. DBH
- Height variable, few feet to 350'+
- Artificial distinctions, environmental dependent
- For this course:
 - Small Tree = < 20' to 25' tall
 - Medium Tree = 25' to 50' tall
 - Large Tree = > 50' tall

Annual versus Perennial



Annual

- **Annual** = completes its life cycle within a single year
 - In trade, considered annual if useful landscape life is < 1 year

- **Biennial** = vegetative first year then reproductive the second, then dies

- **Perennial** = lives several to many years



Biennial



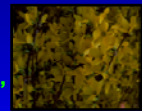
Herbaceous perennial



Woody perennial

Shrubs (Bushes?)

- Perennial, rarely annual
- Woody, upright or spreading growth habits
- Single or multiple trunks
- < 4" to 6" in DBH
- Height variable, but typically <20'
- Artificial distinctions, environmental dependent
- For this course:
 - Small Shrub = < 4' tall
 - Medium Shrub = 4' to 8' tall
 - Large Shrub = > 8' tall



Vines

- Annual or perennial
- Woody or herbaceous
- Long trailing or climbing stems
- Special climbing structures
- Sometimes exhibit heteroblasty
 - Vine in youth, shrubby at maturity
 - English Ivy (*Hedera helix*)
 - Poison-Ivy (*Toxicodendron radicans*)

Scientific Names

- Latin Names, Binomial system, or Linnean system
 - Started by Carl von Linne, known as Linnaeus
 - *Species Plantarum*, 1753
 - Previously named descriptively, very cumbersome
 - System extended to families by A.L. de Jussieu
 - *Genera Plantarum* in 1789.
 - Rules for naming plant taxa standardized
 - The International Code of Botanical Nomenclature (1972, 1995, periodic updates)
 - Latest 2006 code at <http://bot.sav.sk/icbn/main.htm>
 - International Code for Nomenclature of Cultivated Plants (1980, periodic updates)
 - Latest 2009 code at <http://www.ishs.org/sci/icracpc.htm>

Groundcovers

- Woody or herbaceous
- Annual or perennial
- Usually low growing and spreading
 - Heights of <2" to 3' or 4' tall
- Often forming a dense mat-like growth
- Best if exhibit good weed suppression
- Frequently used for erosion control

Scientific Names

- Not perfect system
 - Rules can create frustration in gardening public when they dictate the revision of commonly accepted names
 - Constant revision of genera, species, and particularly within species classifications
 - Latin is dead language, so the pronunciation of names is debatable

Scientific Names

Why not just use common names?

- Scientific names convey relatedness
- More than one common name per species
- More than one species per common name
- Common names vary from locale to locale
- Legal consequences
- Professionalism
- Product labeling (Ag. Chemicals, etc.)



Texas Maroon
Expires mm-dd-yy
12L3456
Expires mm-dd-yy

TAMU hangtag incident

To Key Or Not To Key?

Botanical Keys =

published systems of dichotomous (yes, no) decisions based on various morphological characteristics (flowers, fruit, roots, stems, buds, leaves, or plant habit) and / or geographic distribution used to determine species identification

Vegetative Key to Common Palms (*Palmae* / *Arecaceae*) in Central Texas

- 1a. Fronds pinnately divided, feather-like form
 - 2a. Segments attached with basal fold convex side up (reduplicate) = *Butia capitata* (Jelly Palm)
 - 2b. Segments attached with basal fold concave side up (induplicate) = *Phoenix canariensis* (Canary Island Date Palm)
- 1b. Fronds fan-like or costapalmate (fan-like, but with remnant midrib)
 - 3a. Fronds fan-like and less than 2 ft in diameter/ length (minus petiole)
 - 4a. Petiole sharply spiny = *Chamaerops humilis* (Mediterranean Fan Palm)
 - 4b. Petiole undulate to dully serrate, not spiny = *Trachycarpus fortunei* (Windmill Palm)
 - 3b. Fronds costapalmate and typically greater than 2 ft in length (minus petiole)
 - 5a. Petiole entire, smooth edge
 - 6a. Developing a trunk
 - 7a. Dominant trunk thick and stout, maturing at \leq 50 ft tall = *Sabal mexicana* (Texas Sabal)
 - 7b. Dominant trunk thinner, maturing at 60 to 80 ft tall = *Sabal palmetto* (Palmetto Palm)
 - 6b. Trunk lacking, leaves originating from base, maturing at 3' - 6' = *Sabal minor* (Dwarf Palmetto)
 - 5b. Petiole armed with large curved spines
 - 8a. Trunk with swollen base, maturing at 50 to 100 ft tall, segments slightly to moderately filiferous = *Washingtonia robusta* (Mexican Fan Palm)
 - 8b. Trunk stout and tapering uniformly, maturing at 40 to 50, rarely 80 ft tall, segments moderately to strongly filiferous = *Washingtonia filifera* (California Fan Palm)

Taxonomy

- **Taxa** = divisions or groupings of plants
 - Singular is **taxon**
- **Species** = "a kind of plant or animal distinct from other kinds in marked or essential features that has good characters of identification, and may be assumed to represent a continuing succession of individuals from generation to generation"

L.H. Bailey

Why Not Just Use Keys?

- No key exists for all species
 - Example, Queen Palm (*Syagrus romanzoffiana*) and Date Palm (*Phoenix dactylifera*) not on the preceding key
- One wrong decision & you are hopelessly lost
 - Example, trunk development of young *Sabal* spp.
- Most useful for differentiating among closely related taxa
 - Example, problems such as Sago Palm (*Cycas revoluta*) which is not a palm (*Arecaceae*), but a Cycad (*Cycadaceae*)
- Often regionally specific
 - This key is useless in Florida, immediate Gulf Coast, lower Rio Grande Valley

Comments on Species

- Bell-shaped curve for characteristics
- Plants do not read books!!!
 - Do not always adhere to published descriptions
- Morphologically speaking fruit and flower structures are best ID features, but often not available
- Non-visible characteristics can be key features
 - Physiological traits and molecular genetic evidence
- Estimating underlying genetic relationships
- Species name consists of two words;
 - Species name = genus and specific epithet
 - Should be italicized or underlined in print
- Species type system - type specimen



Taxonomic Classifications:

Taxonomic category	Scientific name of the taxa	Common name of the taxa
Kingdom	Plantae	Plant kingdom
Phylum (Division)	Angiospermophyta (Magnoliophyta)	Fruit bearing plants
Class	Angiospermae (Magnoliopsida)	Flowering plants
Subclass	Dicotyledanae	Dicotyledonous plants
Superorder	Rosidae	Rose superorder
Order	Fabales	Legume order
Family	Fabaceae (Leguminosae)	Legume family
Subfamily	Mimosoideae	Mimosa subfamily
Genus	Acacia	Acacia genus
Species	<i>Acacia farnesiana</i>	Sweet Acacia

Hierarchical structure of classification.

We deal with mostly family or lower in the hierarchy.
Taxonomy = systematic classifications or groupings.
Nomenclature = systematic naming of groups.



Superspecific Taxa

- **Genus** = more or less closely related and definable group of plants containing one or more species

Genera = plural

Examples of plants in the genus *Tagetes*



- **Family** = more or less closely related and definable group of plants containing one or more genera

Families = plural

Examples of plants in the family Asteraceae (Compositae)



Infraspecific Taxa

Subspecies = a distinctive subdivision of individuals with characteristics different than the species type, but insufficiently different to warrant species status

Nearly always geographically related

- Often represents incomplete speciation
- Abbreviated “subsp.”
 - *Chilopsis linearis* subsp. *arcuata* (western taxon)
 - Similar to variety, easy prey for over zealous taxonomists

Infraspecific Taxa

Forma or **Form** = a subdivision of plants within a species that differs in one or a few characteristics from the species type

- Often not geographical or environmentally related
- Seldom used classification today
 - Many groups previously designated as forma are today being designated as varieties
- Abbreviated as “f.”
- *Ilex verticillata* f. *aurantiaca*



Infraspecific Taxa

Varietas or **Variety** = a distinctive subdivision of individuals with characteristics distinct from the species type, but not to the extent that they warrant subspecies or species designation

Differ from the species in several important characteristics

- Usually in response to some environmental gradient, but it is often not as discontinuous as with a subspecies

Infraspecific Taxa

Cultivar or **Cultivated Variety** = subgroup within a species that is a cultivated clone or highly inbred line

- Key is that it is propagated and continued by cultivation and does not usually reproduce true to type unaided by man

Designated by enclosing the cultivar name in single quotes, placed after specific epithet, subspecies, variety or forma

- Not italicized, capitalize first letter of each word
- Typically a vegetatively propagated clone
 - *Chilopsis linearis* 'White Storm'
 - *Chilopsis linearis* cv. White Storm
- Sometimes a highly inbred line
 - *Zea mays* var. *rugosa* 'Golden Bantam'



Variety (continued)

- Abbreviated as “var.”
 - Placed between specific epithet and variety
 - Italicize or underline variety name, but not “var.”
 - *Cercis canadensis* var. *texensis*
- Current trend is to use subspecies for former subspecies and variety categories and to use variety for what was once a forma designation
- Not the same thing as a cultivar or cultivated variety, varieties must be naturally occurring



Trademark Versus Cultivar Names

- Cultivar names are not protected (i.e. in public domain)
- Plant patents are limited, 17-20 yr. duration
 - Generally cannot be “wild plants”
- Trademarks can be protected indefinitely
 - ™ versus ® designation
 - Also allows branding, example Texas Superstar®
 - Protect “found plants”
- Promotion of plants by trademarked names allows companies to control marketing of their cultivars
 - Creates major confusion in the trade
 - Substitute different genotypes

Helianthus annuus 'Dakota Gold'
PVP 20060009



Intraspecific Taxa

Hybrid = progeny of 2 genetically different organisms

- Technically progeny from any two individuals that are not the same clone
- Typically assumed to be between two species (intergeneric or intrageneric interspecific hybrids) or two distinct inbred lines (example intraspecific hybrid corn or F₁ bedding plants)
- **Intrageneric hybrid** = progeny of a cross between different species within the same genus
 - Common occurrence in plant kingdom
 - Designate with lower case "x" or multiplication symbol between genus and specific epithet
 - *Acer x freemani* =
Acer rubrum x *Acer saccharinum*



Clarifying Some Design Terms

- **Use Your Glossary!**
 - Many other terms used or referenced during lecture, labs and in your assigned readings are defined in the expanded glossary at the back of your text
 - If you still do not understand them or cannot find them
 - Write them down to ask in class

Interspecific Taxa

Intergeneric Hybrid = progeny from different species each within different genera

- Relatively rare occurrences
 - Perhaps questions the validity of genera differences
- Designated with capital "X" or large multiplication symbol placed in front of the genus name



X *Chitalpa tashkentensis* =
Catalpa bignonioides X *Chilopsis linearis*



X *Cupressocyparis leylandii* =
Cupressus macrocarpa X *Chamaecyparis nootkatensis*

Questions / Comments?

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Scientific Authorities

(or as students ask what numbskull came up with this idea?)

- The honor of naming a newly described plant taxa is accorded to the person who first publishes a valid description
- Hence the initials and/or letters following various taxa in a formal written context indicate the scientific authority (s) that named the taxon



- *Acer rubrum* L.
- *Brassica oleracea* L. var. *acephala* A.P. de Candolle
- *Ziziphus obtusifolia* (W. Hooker ex J. Torrey & A. Gray) A. Gray