Monocots – The Other Angiosperms

- Evergreen knows the Poaceae (Graminae) which is the 2nd largest family behind the Orchidaceae
- Many others: Arecaceae in fall semester, Liliaceae, Agavaceae, Iridaceae, Zingiberaceae, Musaceae, etc.
- Design elements from exotic to monotonous
- Boldly coarse to gossamer and minutely fine-textured
- Ecologically integral to most biomes
- Food, spices, fiber, construction materials, medicines
- Forage for native wildlife and livestock
- Yield massive numbers of ecosystem services when incorporated into built environments

Assigned Readings for Plant List 3

Read the introduction to ornamental grasses on p. 489 and the pages in your textbook associated with the family descriptions and individual taxa covered on Plant List 3 that was distributed in lab. These plant lists are also available on the course website.

http://aggie-horticulture.tamu.edu/syllabi/308/home/frameset.htm

Musa × paradisiaca
Banana

- Annual (colder zones), herbaceous perennial (USDA z. 8/9a) or small evergreen tree (z. 9b-13)
- Suckering unbranched pseudo-stem 2’ to 20’ tall, huge 1’-10’ long elliptic leaves
  – Fruit commercially important, usually produced only following 2 or more frost-free growing seasons
**Musa × paradisiaca**

**Banana**

- Bold tropical statement, some variegated clones
- Intolerant of cold (foliage) and poor drainage
- Banana wilt, spider mites, scale, wind damage, salt damage, & micronutrient toxicities are possible; Musaceae & Zingiberaceae are related

**Alpinia zerumbet** ‘Variegata’

**Variegated Shell Ginger Zingiberaceae**

- Evergreen (USDA z. 9b - 13) to dieback (z.9a-8b) rhizomatous shrub-like spreading clump of unbranched stems, 3’ - 5’ tall
- Valued for large, bold, variegated leaves / pseudostems
- Drooping clusters of pearl-white to pink fragrant flowers are mildly attractive; seldom borne on cold damaged plants
- Heat tolerant, but best with some shade and regular irrigation
- Foundation plantings, containers, summer accent, mixed beds; good foliage color for shade; species type larger with flowers

**Hedychium coronarium**

**Butterfly Ginger**

- A rhizomatous stiffly upright evergreen (USDA z. 9-13) or deciduous (z. 7-8) perennial herb, 4’ to 6’ tall with slow indefinite spread
- Offers highly fragrant recurrent clusters of white butterfly-like flowers, bold coarse foliage, and upright form
- Can be invasive in tropical climates
- Tolerates full sun with adequate water, but is best with some shade
- One of tougher more cold tolerant gingers for shade garden, woodland edge, background for mixed perennial / annual beds, cut flower garden, & leis
- *Zingiber officinale* is the culinary ginger
Other Gingers For Shade

Kaempferia sp.  Costus pulverulentus  Hedychium flavescens  
Hedychium gardnerianum  Hedychium ‘Lemon Beauty’  Costus sp.

Dianella tasmanica ‘Variegata’  
Variegated Tasmanian Flax Lily

- SE Australia & Tasmanian native grown in SE USA as 1’ to 2’ tall clump forming herbaceous perennial
- Valued for white and green variegated foliage
- Small flowers and blue fruit are secondary assets if produced; some foliage reversions may occur
- Best with some shade; well drained soils and adequate irrigation are needed
- Adapted to USDA hardiness zones 9 (8) to 13
- Cold damage & leaf spots can be problems
- Small shrub or ornamental grass substitute, edging, massing, shade color, patio containers, groundcover

Bamboos

- Most bamboo species grown in the USA are from about half dozen genera
- Essentially woody grasses
- Pachymorphic (sympodial rhizomes, clump formers) vs. leptomorphic (monopodal rhizomes, running types)
- Variable from short groundcovers (Arundinaria pygmaea, Sasa spp.) to timber taxa (Phyllostachys bambusoides) reaching 50’ tall
- Bring exotic appeal and unusual sounds; some are edible
- High economic and aesthetic value
- Essential for Oriental / Asian gardens

Phyllostachys aurea  
Golden Bamboo

- Thicket-forming culms from underground rhizomes, 10’-15’ (20’) tall, new shoots yellow
- Forms impenetrable mass of 2” diameter culms, provides tropical effect, but can be extremely aggressive in favorable sites
- Adapted to most soils; sun to part shade; USDA z. 7b - 13; common in southern USA
- Vertical accent, staple in Asian gardens
**Bambusa multiplex**
Hedge Bamboo

- One of the more commonly grown clump-forming bamboo species
  - Grows from short rhizomes so clumps are very dense, but the spread is slow
  - Pachymorphic (sympodial rhizomes) rather than leptomorphic (monopodal rhizomes)
  - Use close spacings for a solid thicket
- Variable in size, 10’ to 15’ (30’) tall
- Tolerates cold in USDA hardiness z. 8 - 13, but it will suffer less winter damage if shielded from cold winds
- Specimens, screens, backgrounds, barrier plants, oriental gardens, tropical accents

**Cortaderia selloana**
Pampas Grass

- Perhaps most popular southern perennial grass, hardy USDA z. 7b (7a)-13
- White, sometimes pink, plumes in late summer held 2’ - 3’ above foliage
  - Effective into winter, but weather is dependent

**Ornamental Grasses**

- Highly underutilized group of plants
- Tough & durable, one or more for every climate
- Add motion to the landscape
- Tremendous softening elements
- Ecologically important
  - Food, shelter, & cover for wildlife
  - Human food & fiber
  - Soil stabilization / building
  - Biofiltration
  - Temperature moderation
  - Noise / glare reduction
  - Invasive potential?

**Cortaderia selloana**
Pampas Grass

- Medium textured arching mound of whip-like leaves to 6’ (10’) tall in sun
- Serrated margins are maintenance liability
- Extremely adaptable, seasonally wet to dry, sand to heavy clay, pH adaptable, heat, drought, salt, and wind tolerant, nearly indestructible once established
- Accent, screen, shrub, barrier, cut flowers
**Pennisetum setaceum**

Annual Fountain Grass

- Subtropical / tropical perennial (z. 9b-13) used as an annual ornamental grass
  - A premier annual ornamental grass for Texas (it returns poorly from cold damage)
  - Red / bronze cultivars most common genotypes
  - Long bottle-brush like flowers, late summer/fall
- Heat loving; takes a variety of sunny sites
- Invasive in some climates/sites
- Border, temporary screen, accent, containers, seasonal soil stabilization
- Maybe replaced by hybrid Napier Grasses?

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**Pennisetum purpureum × P. glaucum × P. squamulatum?**

Napier Grasses

- Wide range of sizes, 3' to 8' (10') tall
- Multi-species hybrids involving *P. purpureum*
- Maroon to green foliage; coarser textured than *P. setaceum*, most cultivars lack flowers
- Use sterile forms, avoid invasiveness
- Variable cold tolerance USDA z. 8 or 9 – 13
- Easily grown on most sunny sites
- Avoid excess fertility, turns green
- Replacing *P. setaceum* in trade with ‘Vertigo’, ‘Princess’, ‘Princess Molly’, etc.? 
- Leaf spots are sometimes a problem

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**Miscanthus sinensis**

Chinese Silver Grass

- One of the most versatile ornamental perennial grasses for much of USA
- Available in a variety of sizes, textures, and foliage colors; biofuel usage
- Some with strong flowers or attractive variegation
- Potentially invasive in some climates; substitute Muhly's?
- Many cold hardy to USDA zone 5, most are tolerant of heat of USDA z. 10 (9)
- Few significant diseases or pests; *Miscanthus* rust?

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**Miscanthus sinensis**

Chinese Silver Grass

- Biofuel research with *Miscanthus* & other large grasses (particularly those with C₄ carbon fixation)
- Perennial in colder climates than with corn & sugar cane
- Potential for marginal sites; *M. sinensis* subsp. *condensatus*
**Aruno donax**

**Giant Reed Grass**

- A very large perennial rhizomatous cane-like grass from Europe forming dense impenetrable stands 10'-15' (20') tall of indeterminable spread; coarse textured; strong vertical form
- Variegated forms are less aggressive, but also less vigorous
- Moderately showy persistent 1' to 2' long panicles occur in summer; needs annual pruning to look good in cold climates
- Extremely adaptable; weedy in wet areas; adapted z. 6 (5) - 13

**Saccharum officinarum**

**Sugarcane**

- Source of much pleasure and pain
- Commercial source of processed sugar
- Incredibly important historic species embroiled in the Civil War, political policy, third world affairs, & rampant obesity
- Coarse variegated canes and purple foliage selections are sometimes used ornamental; evergreen or deciduous perennial grass potentially 20' to 25' tall in USDA hardiness zones 9 – 13

**Zea mays**

**Corn**

- 1 of 3 Sisters of Native Americans
- Human, stock, wildlife food
- Warm season screening / backgrounds
- Annual summer or fall accents
- Dual purpose landscapes, educational and heritage gardens, biofuels
- Sunny well drained soils, high fertility
- Same disease / pests as commercial corn
- Dent, flint, sweet, calico, and pop corns

**Schizachyrium scoparium**

**Little Bluestem**

- Classic native North American tall grass prairie species for USDA zones 3 - 10
- Picturesque 2' to 3' (5') erect habit
- Blue-green summer foliage, bronze-brown in winter, plant's best feature
- Excellent summer, autumn, winter accent; naturalizing, wildflower and meadow plantings; slope stabilization
- May perform poorly in dense plantings
**Schizachyrium scoparium**  
*Little Bluestem*
- Good for textural effect, xeriscapes, wildflower plantings, cut flower gardens, wildlife food and cover
- Sun to very light shade, any well drained soil, tolerant of poorer soils, prune back before spring growth
- Avoid mowing and poorly drained soils

**Andropogon glomeratus**  
*Bushy Bluestem*
- Coarser, more robust relative of *S. scoparium*
- 2’ to 5’ erect clumping grower; USDA z. 5 - 10
- Showier flowers than *S. scoparium*
- Suitable seasonally wet soils
- Rain gardens, coastal, roadsides, bioswales, massing, cut flowers, biofiltration

**Chasmanthium latifolium**  
*Inland Sea Oats*
- Upright arching clump-forming perennial, z. 5 – 9 (10), grass with handsome nodding seed heads
- Adapted to wide range of soils and sites, full sun to moderate shade
- Effective as a seasonal groundcover / soil stabilizer
- Winter effectiveness is weather dependent; 1’ to 2’ (2½’) tall
- Best mown to the ground prior to new spring growth resuming

**Uniola paniculata**  
*Sea Oats*
- Strongly upright 3’ to 5’ (8’) tall evergreen to deciduous perennial, USDA z. 8 (7) - 13, rhizomatous grass with strong vertical form and handsome flowers/fruits
- Important in dune stabilization, extremely salt, heat, wind and somewhat drought tolerant
- Important in coastal ecology & landscapes; cut flowers
- Protected in many states
**Uniola paniculata**  
*Sea Oats*

**Muhlenbergia spp.**  
*Muhly Grasses*

- Genus of @ 125 species of mostly clump-forming winter deciduous, semi-evergreen or evergreen grasses
- *Muhlenbergia lindheimeri* (Lindheimer Muhly), *M. capillaris* (Gulf Muhly), and *M. dumosa* (Bamboo Muhly) are most commonly used in our regional landscapes
  - Most are medium size, ranging from 2’ to 6’ tall, with varying cold tolerances from USDA z. 6 to 8, heat tolerant in 10 to 13
  - Highly variable in texture; some with late season flowers

**M. capillaris**

**M. lindheimeri**

**M. dumosa**

**Nassella tenuissima**  
*(formerly Stipa tenuissima)*  
*Mexican Feathergrass*

- Extremely fine textured angel hair-like grass
- Outstanding textural contrast to coarser xeric plants
- Occasional spring renewal pruning is required
- Useful in USDA z. 7 (6) - 9; poor drainage and high RH are anathema to success with this species
- Very drought, heat, high pH soil, and wind tolerant
Weeds can be an issue with clump-forming grasses used for bedding/massing.

The Ultimate Groundcovers Are Turfgrasses!
- Dense canopy, rapid surface coverage
- Excellent weed suppression
- Mat-like growth
  - Tufted (tillering, tussok) versus running
  - Stolons versus rhizomes
- Seeding, sprigging, plugging, & solid sodding
- Warm season versus cool season turfgrasses
- No year-round green turfgrass for most of Texas
- Value of winter green versus spring transition challenges associated with over-seeding?

Growth Habit Matters
- Rule of thumb remove ≤\(\frac{1}{3}\) of leaf surface area at a mowing
- So if grass grows 3” per week, then it grows roughly \(\frac{1}{2}\)” day
  - Maintained at 6” mow @ 6 days
  - Maintained at 4” mow @ 4 days
  - Maintained at 2” mow @ 2 days
  - Maintained at 1” mow daily

Mowing Height Trade-Off

Rhizomes  Stolons  Clumps (tufted, tillering, tussock)
**Stenotaphrum secundatum**  
*St. Augustinegrass*  
- One of most prevalent warm season turfgrasses for Southern USA  
- Spreads via stolons, but not rhizomes, usually mown 2” to 3” tall  
- Good in both sun and some shade, needs min. 8 hr. sun to hold its own  
- Problems with drought, poor drainage, SAD, take-all patch, chinch bugs, white grubs, etc.  
- Coarse texture; hardy USDA z. 8(7)-13

**Cynodon dactylon**  
*Bermudagrass*  
- One of premier warm season turfgrasses for S. USA  
- Spreads via stolons and rhizomes, mow ½” to 1½”  
- Good in sun, but shade intolerant; USDA z. 7(6) - 13  
- Invasive in landscape beds, good as sports turf  
- Several insects and pest problems, but few serious  
- Fine to medium texture

**Food for thought on Bermudagrass**  
- Very aggressive landscape weed  
- Do we want herbicide resist turfgrass?  
- Not often on invasive species legislation, but is probably more extensively naturalized than most exotic species – selective perception due to economics or sentiment?  
- Very limited native alternatives to the primary exotic turfgrasses

**Buchloe dactyloides** *(Bouteloua dactyloides)*  
*Buffalograss*  
- Stoloniferous warm season turfgrass  
- USDA z. 4 - 10, mow 2” - 3”  
- Native, drought tolerant, but needs water to stay green, better on alkaline than acidic soils  
- Dioecious, male inflorescences unattractive  
- Not good in high traffic areas or wet sites
**Zoysia spp. Zoysiagrass**

- Warm season grasses, USDA z. 6 – 13; expensive
- Stolons and rhizomes, fine to medium textured
- Lower mowing frequency, often mow at ½” to 2”
- Salt and drought tolerant, sun to moderate shade, but slow growing, foliar rust is bad in late fall
- Good wear tolerance, but poor recovery ability

**Lolium perenne Perennial Ryegrass**

- Clump-forming cool season turfgrass
- Tolerates cold to z. 5, but not perennial in heat of z. 7
- Useful for over-seeding for winter color, problems with spring transition
- Finer textured than *L. multiflorum*
- More expensive than *L. multiflorum* & less frequently encountered

**Lolium multiflorum Annual Ryegrass**

- Cheaper seed, coarser textured, otherwise suitable for similar uses as *L. perenne*
- Requires frequent mowing
- Winter annual or over-seed in Texas; can reseed as weed if inflorescences are matured
Poa pratensis  
Kentucky Bluegrass

- Loosely tufted perennial turfgrass in USDA hardiness z. 3 – 6 (7)
- Fine textured soft “barefoot” grass
- Often “the” preferred turfgrass in cooler climates
- Sometimes used as a lawn grass in Texas / Oklahoma panhandles
- Occasionally used as a winter over-seed in warmer regions

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