Lecture Note Pages

The following pages are for you to take notes during the lecture portion of class. These do not follow the slides exactly, but were designed to help you organize the important points presented in the lecture.

Herbaceous plants die back to the ground each ________ and are not ______________

__________ completes its life cycle in one year

__________ completes it’s life cycle in two years

_______ flower/reproduce for several or many years

Flowering habits

_______________ BIG flowers, but not many

_______________ Lots of flowers, but smaller

_______________ Somewhere in between

_______________ lots of tiny little flowers

Flower structures

Tubular

Labiate

Cruciform

Campanulate

Funnelform

The _________________ Family is likely to be one of the best represented plant families in your backyard.
Common inflorescences

![Head][Umbel][Raceme][Panicle][Spike]

Plants within the same ___________ often are susceptible to similar ________ and have similar __________ needs.

**Garden design**

Consider both _________ and _________ of annual and perennial flowers.

**Why annuals?**

- Provide ___________________ color in spring and early summer
- Flower all summer
- Bred to be very ________________
- ___________________ to a wide range of ________ and ____________ conditions.

Many uses including:

---

*Botany in a Day, The Patterns Method of Plant Identification*  
— by Thomas J. Elpel
Types of annuals

___________________ annuals: easily injured by light frost.

___________________ annuals can survive light frosts without damage

Annuals can be:

___________________ seeded into the planting bed

___________________ indoors and __________________

Purchased as _________________.

Purchasing transplants

• Look for ________________ plants

• Inspect for ________________ or ________________

• Avoid ________________, ________________ plants and yellowed leaves

• The best annual flower transplants have_________________________________.

Planting annuals

Plant annuals outdoors after danger of frost, except for those that can tolerate light frost

Starting seeds indoors
Handouts for UW-Extension Master Gardener Level 1 Training

- Fill shallow containers with ____________seed-starting mix
- Plant seeds to a depth of ____________ their diameter
- Mist or bottom ____________ to wet media
- Cover and place in warm, light location
- As soon as first ____________ appears, uncover and move to cooler, bright location
- The worst conditions are too much ____________ with low ____________
- Ideal is 65-68ºF and ____________-hour days
- ________________ lights work great
- Protect against damping off (fungal disease) with ________________
- ________________ prior to transplanting outside

**Direct Seeding**

- Some annuals can be direct seeded into the bed
- Prepare soil as for transplants
- Wait until danger of ____________ is past
- Smooth surface and plant seed at a depth of ____________ their diameter
- Cover with thin layer of organic matter or vermiculite to prevent crusting
- Mist and keep seedbed moist until germinated

**Maintaining Annuals**

- Annuals need 1-2 inches of ____________ per week
- Tall annuals may need to be ____________
- Fertilize annuals more often than perennials, usually ____________ during growing season

**Winter Clean Up**

4  Session 9: Herbaceous Plants
• Remove any diseased plants
• Decide whether to leave plants for winter interest or remove
• Condition soil for next year (e.g., add organic matter)

Perennials

• Don’t have to re-plant every year
• Changing interest throughout season
• Variety
• Low maintenance
• Can _________________ to get more plants
• Can be solutions for tough sites
• Winter interest, wildlife food

Types of perennials

• __________________—— often grown as annuals
• __________________—— Die back to ground in our winters, but farther south, will leaf out on above ground stems (aka sub-shrubs)
• __________________—— dies back to ground in winter but come back in spring

Hardiness
Cold hardiness

Heat Hardiness

What zones are you?

• Be sure to choose perennials hardy to your zone
• Zones can be pushed by planting in microclimates or protected sites, or by special winterization such as mulching

Growing Perennials

• Started from seed, either direct seeded or started indoors, just like annuals
• Purchased as transplants in a wide variety of container sizes
• Purchased as bare root stock

Choose perennials based on:

• Soil and moisture ____________
• Light
• ____________ for the planting
• ____________ time
• Plant size

Purchasing perennials
• Purchase potted perennials that are ____________ and ____________

• Buy only from ______________ mail order companies, the more local the better; if plants arrive too early, store in 50-degree conditions, keeping material moist

• Potted perennials can be planted any time during the growing season, but try to provide at least a month before winter weather arrives

Because most perennials bloom for only a short period each year, choose them for their form, foliage, texture and structure

• Coordinate bloom times with what’s blooming or providing interest at the same time

• Perennials are available from ½-inch tall creeping thyme to 8-foot tall hibiscus

Planting perennials

• Be sure to allow enough space for spread

• Plant to level growing in container

• For bare root, plant at root/shoot interface

• Water thoroughly until established

• Beware of settling soil that could leave crown exposed

Maintenance

• _______________ – use mulches, pre-emergent herbicides, hand weeding/cultivating

• _______________ during droughts

• _______________ may be helpful – in early spring, usually only nitrogen

• Tall plants may need _______________

• Deadhead may help re-blooming

• Monitor for _________________ and _________________

• _________________ when needed

• Winter mulch new plantings after ________________ freezes
Handouts for UW-Extension Master Gardener Level 1 Training

**Bulbs, Corms, Tubers**

The term “bulb” often includes corms, tubers, and rhizomes.

**Why grow bulbs?**

- For bright showy ________________, especially in early spring
- Easy to grow
- Relatively inexpensive
- Combine well with other plantings

Most bulbs are imported from the ________________, and inspected by US Dept. of Agriculture to be disease and pest free.

Bulbs are useful in beds, containers, grassy plantings, cutting gardens, ________________, areas, rock gardens, and for forcing indoors.

“Bulbs” are underground ________________, storage organs that contain large amounts of stored carbohydrates.

_______________, bulbs – can stay out through winter
_______________, bulbs – must be dug and stored inside

**True bulbs**

- Have many leaves compressed in the bulb
- Have a flower primordium
- Include tulips, daffodils, and lilies

**Corms**

- Are swollen _________________.
- Have ________________, ____________________, and lateral buds growing from the nodes
- Include gladiolus and crocus
Tubers

- Swollen roots
- Have one to several ________________, near the old stem
- Tubers without eyes will not ________________,
- Include dahlias and tuberous begonias

Rhizomes

- Swollen roots
- Include bearded iris and cannas

Purchasing Bulbs

- Look for large bulbs
- The larger the bulb, the more food is available to develop blossoms
- Very small bulbs may not bloom the first year
- Bulbs are often graded and sold by circumference, and bigger bulbs cost more
- Avoid root plate damage, which may result in poor root growth
- Avoid moldy or shriveled bulbs, which may indicate poor quality, loss of stored water or food, or disease; bulbs should be firm
- Avoid soft, sour-smelling or lightweight bulbs, which may indicate a fungal disease and the bulb will not bloom
- Purchase from a reputable source. Mail order is popular and you can find a wide variety of cultivars in catalogs
- Buy in quantity for better prices
- Be wary of sales. Late season sales may mean lower quality bulbs

Storing bulbs

- Bulbs can be held temporarily at 60-65°F
- Don’t store bulbs in garages or any other area where exhaust fumes are present
- Bulbs held over winter and planted in spring will not flower.
Plantings and growing bulbs

- Hardy bulbs are usually planted at a depth of 2-3 times their height
- Tender bulbs are planted close to the soil surface
- Mix in a slow-release fertilizer high in phosphates, such as bone meal
- Most bulbs need well-drained soil
- Protect bulbs from wildlife
- Most bulbs require at least 6 hours of full sun each day
- Many soil types are tolerated, but most bulbs prefer soil rich in organic matter

- Fertilize with a complete fertilizer, such as 5-10-5, right after bulbs bloom
- Fall fertilization with phosphate can be helpful

- Allow foliage of spring-blooming bulbs to die back on its own. The plants must perform photosynthesis to store food in bulb and form flower bud for next year
- Once foliage is yellowed and senescing, you can remove it

- Bulbs such as daffodils, snowdrops and grape hyacinths multiply and should be divided regularly. Others, such as tulips and hyacinths, only replace the old bulb each year
- Bulbs are best divided and transplanted when they are dormant, in late June or July

Summer “bulbs”, such as dahlias and cannas, must be dug in fall and stored inside over winter

- Dig after foliage has yellowed or died back
- Rinse soil and let bulbs dry off
- Store in paper bags or loose peat moss
- Temperatures of 55-65°F and low humidity are best
- Check bulbs periodically over winter for mold or dryness
Sample Exam Questions

These questions are typical of the types of questions you will be asked in the final exam. Answers are from the lecture and reading (training manual, Extension publications, etc.).

1. A polychromatic color scheme in the garden
   A. Uses a limited number of neighboring colors from a color wheel
   B. Combines opposite colors from the color wheel
   C. Includes many colors
   D. Uses plants of a single color in various tints and shades

2. Which of the following is NOT true regarding cold hardiness zones?
   A. Wisconsin has 3 zones, 3, 4, 5
   B. The zone is based on the average minimum winter temperature
   C. Zone 3b is colder than zone 3a
   D. Microclimates may allow you to “cheat” your zone

3. Tender annuals
   A. Are hardiness zone 3a and lower
   B. Complete their life cycle in 3 or more years
   C. Can endure heavy frosts and freezes
   D. Should not be planted outdoors until the risk of frost has passed

4. Which of the following is an example of sexual plant propagation?
   A. Direct sowing of seeds
   B. Stratification
   C. Herbaceous stem cuttings
   D. All of the above

5. A true bulb is
   A. A thick, horizontally growing underground stem
   B. Modified roots that contain one or more “eyes”
   C. Underground stem surrounded by modified leaves
   D. A swollen, compressed stem with nodes, internodes, and lateral buds

6. The most appropriate source for information pertaining to controlling earwigs in the home garden is:
   A. University of Wisconsin-Extension Publication A3382
   B. Jerry Baker, America’s Master Gardener™
   C. University of Florida-Extension, Publication ENY-221 Pillbugs, Sowbugs, Millipedes, and Earwigs
   D. University of Wisconsin-Extension Publication A3640

7. Disbudding is the process of
   A. Breaking apical dominance
   B. Removing spent flowers
   C. Removing secondary flower buds from a stem
   D. Heading back
8. Incorporating organic matter into the soil
   A. Can improve soil structure
   B. Add micronutrients
   C. Improve water holding capacity in sandy soils
   D. All of the above

9. Sharon Coneflower has had difficulty removing a patch of *Aegopodium podaria* ‘Variegatum’ commonly known as “Snow on the Mountain”. What would you advise her to do?
   A. Mow frequently
   B. Use a pre-emergent herbicide such as Trifluralin (Preen) to kill the rhizomes.
   C. Apply a post-emergent herbicide such as Roundup as directed & repeat as needed.
   D. Apply a post-emergent herbicide such as Roundup using twice the application directions on the label, to ensure the rhizomes are killed.

10. A water soluble balanced blend fertilizer is best used
    A. To fertilize established trees and shrubs
    B. For fertilizing lawns at major holidays
    C. For annual beds and containers
    D. All of the above

11. According to publication XHT1062, which of the following is not true about Japanese beetle?
    A. The presence of beetles on or near a plant will attract more beetles
    B. They have one generation per year
    C. Adult beetles feed on a wide range of host plants
    D. Adult beetles damage turf

12. Which of the following is the correct scientific name for the hardy bulb commonly known as Siberian squill or star of Holland?
    A. *Puschkinia scilloides* var. *siberica*
    B. *Scilla siberica*
    C. *Freesia x hybrid*
    D. None of these

13. The correct scientific name for Evening Primrose or Ozark Primrose is:
    A. *Oenothera Missouriensis*
    B. *Oenothera missouriensis*
    C. *Oenothera ozarkiensis*
    D. Oenothera missouriensis
As a MGV you will be asked to help clients figure out what is wrong with their plants. Sometimes the problem will be very vague and you may not have a specimen or photo to look at. Consider the information presented in each of the following scenarios and think about what is useful? What information is not useful? What information is missing? Based on the information provided, determine a possible solution for the client. Use an IPM approach for each of your answers.

**Scenario 1:** It’s July and Mr. Green is highly perturbed with all the garden phlox he inherited from his mother. It is now covered with a white coating and is losing leaves. It’s planted on the east side of his home. He irrigates one evening a week using an overhead sprinkler.

What is the *most likely* disease called?

Using an IPM strategy, what advice would you give Mr. Green?

**Scenario 2:** Sharon Coneflower is aghast that her prized roses are suddenly being ravaged. She sees clusters of dark-colored “bugs” in the flowers and on hole-ridden leaves.

What do you think is causing this problem?

Using an IPM strategy, what advice would you give Ms. Coneflower?

**Scenario 3:** Mrs. Smith complains about a low-growing weed with purple flowers in the spring that is crawling all through her flower beds.

What weed do you think this is?

Using an IPM strategy, what advice would you give Mrs. Smith?

Further into the conversation with her, she mentions she has a small dog and is worried chemicals will hurt it. Would that change the answer you give her?
Additional Resources

Note: dozens of books are published annually on landscaping with flowers, especially perennials. There are many excellent recent titles besides those listed below.

American Horticultural Society A to Z Encyclopedia of Garden Plants by H. M. Cathey and C. Brickell. 2004, DK Adult — includes growing tips, information about native habitats and ornamental features, but the main attraction is the individual plant entries. The 1989 edition arranges its catalog of 8000 plants not alphabetically by name but by season and color, while the 15,000 plants in later editions are organized alphabetically.

Armitage’s Garden Annuals: A Color Encyclopedia by A. M. Armitage. 2004, Timber Press — this encyclopedic reference provides a wealth of photographs of the ever-increasing array of annuals. The lively text is both informative and entertaining; it gives up-to-date recommendations for the most desirable species and cultivars.


Gardening With Perennials, by Horticulture Magazine (Ed). 2004, Betterway Books — this authoritative guide covers a range of perennials, along with instructions on how to grow them and 300+ illustrations.

Gardening with Perennials Month by Month by J. Hudak. 1993 (2nd ed), Timber Press — focused primarily on particular species to allow you to plan your garden for continuous bloom from March through Sept. (geared to zone 6).

Growing Perennials in Cold Climates by M. Heger and J. Whitman. 1998, McGraw-Hill — cold climates, so the authors define, are regions in which winter temperatures can fall below 20 degrees. Suitable for a beginning gardener covering just 50 perennials, but does not include many useful and common species and has no index.

Perennials for Minnesota and Wisconsin by D. Engebretson and D. Williamson. 2004, Lone Pine Publishing — full of helpful information for the amateur gardener, singling out plants that are hardy in the upper Midwest.


Taylor’s Guides to Bulbs: How to Select and Grow More Than 400 Summer-Hardy and Tender Bulbs, by B. Ellis. 2001, Houghton Mifflin — a comprehensive guide to selecting hardy and tender bulbs, with instructions on propagation, overwintering and forcing, and lists of bulbs by bloom time.

The Well-Tended Perennial Garden: Planting & Pruning Techniques, by T. DiSabato-Aust. 1998, Timber Press — includes the impact of a particular perennial in the landscape as a whole and useful information on how to extend the blooming season (mainly by pruning).

UW-Extension Publications on herbaceous plants:

- For UWEX Garden Fact Sheets, see the Wisconsin Horticulture website (http://hort.uwex.edu/) and search for specific plant names.
- For articles on the MG website, go to http://wimastergardener.org/?q=HortArticles and choose “Annuals” or “Flowers” or “Foliage plants” or “Perennials” from the drop-down box for LIST BY CATEGORY and click “Go”
Take-Home Challenge 9: Fabulous Flowers

There are all kinds of wonderful herbaceous plants, including bulbs, some used primarily as foliage plants, and those grown for their beautiful flowers. This puzzle includes both common and not-so-common types of herbaceous ornamentals. Each clue is the common name of a plant; fill in the spaces with the scientific name of the genus of that plant. You can find most of the answers in your MG training manual.

ACROSS
1. Lady’s mantle.
7. Cranesbill.
10. Sweet rocket or dame’s rocket.
12. Goat’s beard.
14. Tulips.
19. Caladium.
22. Desert candle.
23. Pincushion flower.
27. Flag.
28. Avens.
29. Flowering onion.
30. Loosestrife.

DOWN
1. Love-Lies-Bleeding.
2. Vinca or periwinkle.
3. Monkey flower.
4. Floss flower.
5. Pot marigold.
6. Ornamental kale.
8. Four-O’Clock.
15. Money plant.
17. Geranium.
19. Caladium.
23. Bacopa.
25. The first part of snapdragon.

What is the characteristic shared by ALL the ACROSS genera?
What is the characteristic shared by ALL the DOWN genera (at least as grown in Wisconsin; this may not be botanically true?)