Rockbridge Extension Master Gardeners

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Herbaceous Landscape Plants

Annuals, Perennials, Bulbs, Herbs

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Welcome to ‘Herbaceous Landscape Plants’

In this module you will learn how to select, plant and maintain annuals, biennials, perennials and bulbs common to this geographic region. You will learn the recommended management of the most common insects and diseases associated with perennials and annuals.

- Read Chapter 15, in your Master Gardener Handbook before viewing these slides
- Browse the Suggested Readings at the end of these slides. They contain online sources that will be helpful for your learning.
- The Test Your Knowledge section is for fun and review

What I Will Learn in This Module (Objectives)

- Advantages and disadvantages of the use of annuals, biennials, perennials, and bulbs in the garden
- Identification and description of the culture and maintenance of perennials and annuals in the area
- Identification and the recommended management of the most common insects, diseases, and other pests for perennials and annuals in the area
- What I Will Become Familiar With:
- Recommended varieties for the area

Herbaceous Plants Include

- Annuals
- Perennials
- Biennials
- Geophytes
- Pond and Bog Plants
- Ornamental Grasses
- Ferns
- Succulents

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Annual

A plant which completes its life cycle in one year. It grows, flowers, produces seeds, and dies within one growing season.

May include some non-hardy perennials

Examples: Alyssum, Petunias, Impatiens



Photo: P. Turner, EMG

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[Gardening with Annuals]

Annuals: Benefits

- Versatile
- Sturdy
- Relatively cheap
- Many new varieties
- Easy to grow
- Produce instant color
- Bloom for most of the season

- Little grooming needed
- Chance to experiment
- If a mistake is made, it's only for one growing season



Photo: P. Turner, EMG

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Annuals: Negatives

- Replace every year
- Effort and expense involved
- Parents of seed are unknown
- Hybrid characteristics will be lost

- Some require deadheading to promote continuous bloom.. If not, will produce seed, complete their life cycle & die



Photo: P. Turner, EMG

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Perennial

A plant that lives for 2 or more years; generally, does not freeze.

Trees and shrubs are perennial.

Tender perennials: a perennial plant (usually herbaceous) that will not overwinter in the garden because it's too cold

Half-hardy perennials: A somewhat vague term often used interchangeably with tender perennial. It generally refers to a plant having moderate resistance to cold temperatures. This term will vary in different hardiness zones.



Photo credit

Perennials: Pros & Cons

Pros:

- Do not have to be set out every year
- “Dead-heading” not required

Cons

- Require pruning and maintenance
- Relatively short blooming period
- Most require transplanting every 3 years

Perennial: Planting Times

Late-summer or fall-flowering: Spring

Spring flowering: Late summer or early fall

Regardless, allow sufficient time for establishment before blooming



Photo: P. Turner, EMG

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Biennial

- A plant which completes its life cycle in two growing seasons
- Vegetative structures and food storage organs are produced the first season
- Flowers, fruit, and seed are usually produced the second season, then the plant dies



Photo credit: Foxglove

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Geophytes



Photo credit Wikipedia

Plants with underground storage organs

Includes: bulbs, corms, tubers, rhizomes

Summer blooming geophytes (dahlia, gladiolus) are planted in spring

Spring blooming geophytes (crocus, tulip) are planted in fall

Photo credit Wikipedia



Geophytes

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Bulbs

- A plant storage structure which usually develops underground and is made of a compressed stem surrounded by fleshy scales. Includes:
  - True Bulbs
  - Corms
  - Tubers
  - Tuberous Roots
  - Rhizomes



[Flowering Bulbs: Culture and Maintenance]

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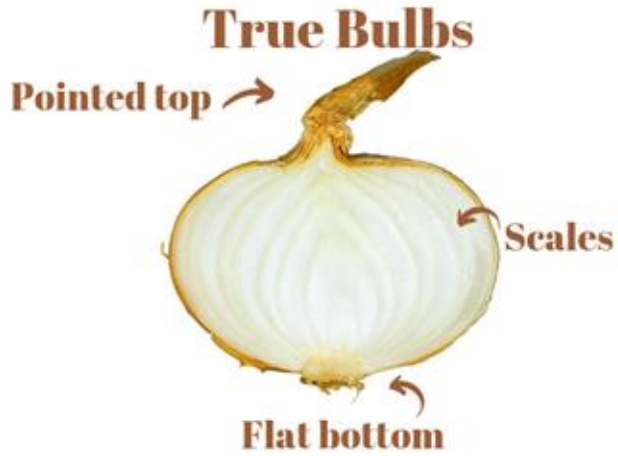
- True Bulb

  A complete, or nearly complete, miniature of a plant encased in fleshy modified leaves called scales, which contain reserves of food. (Example: Onion)



- Corm
- A solid, swollen, underground stem whose scales have been reduced to dry, leaf-like covering. (Example: Crocus)

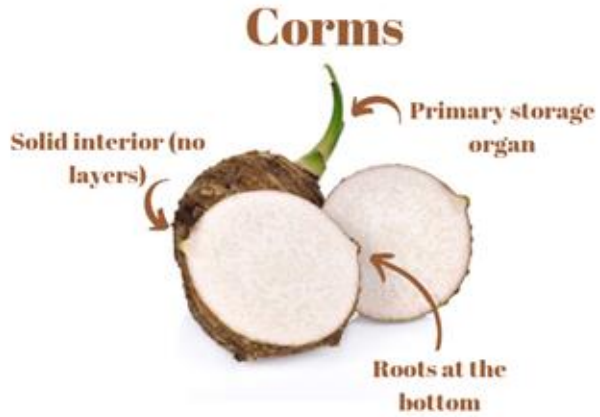


Photo credit

Tuber
An enlarged portion of an underground stem that serves as a food storage organ and has “eyes” or buds. Example: Irish Potato

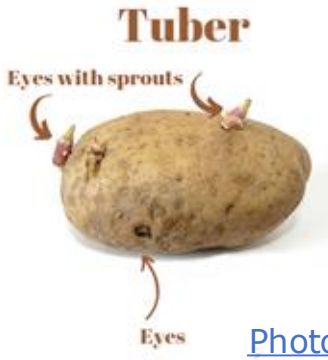
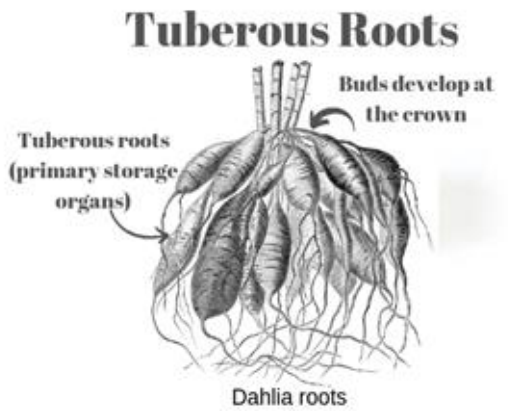


Photo credit:

Tuberous Root
An enlarged root, without “eyes” or buds, which stores food for the plant. Example: daylily, dahlia



Rhizome
A horizontal underground stem.
Example: Ginger



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Bulbs: Selection, Planting, Maintenance

- Select quality bulbs; size matters
- Store in cool dry place

  rhizomes, tubers, and tuberous roots are more easily dried out than bulbs and corms and should be stored in peat, perlite, or vermiculite
- Need full sun; good drainage
- Spring bloomers are planted in fall
- Plant 2 ½ - 3 times depth of bulb
- Usually, rainfall is sufficient water
- Mulch 2-4 inches, winter only

Bulbs: Selection, Planting, Maintenance

- Fertilize 5-10-10 after bloom
- Deadhead after bloom
- Leave foliage in place until it has turned brown to help strengthen bulb; bulbs dug and moved before foliage fades may not bloom for several years
- Storage: Dig, dry and store in a cool dry place at 60-65 degrees; do not store more than two or three layers deep; Clumping bulbs (begonia, canna) should have soil left on them after digging and should be stored on a slightly moistened layer of peat or sawdust in a cool place

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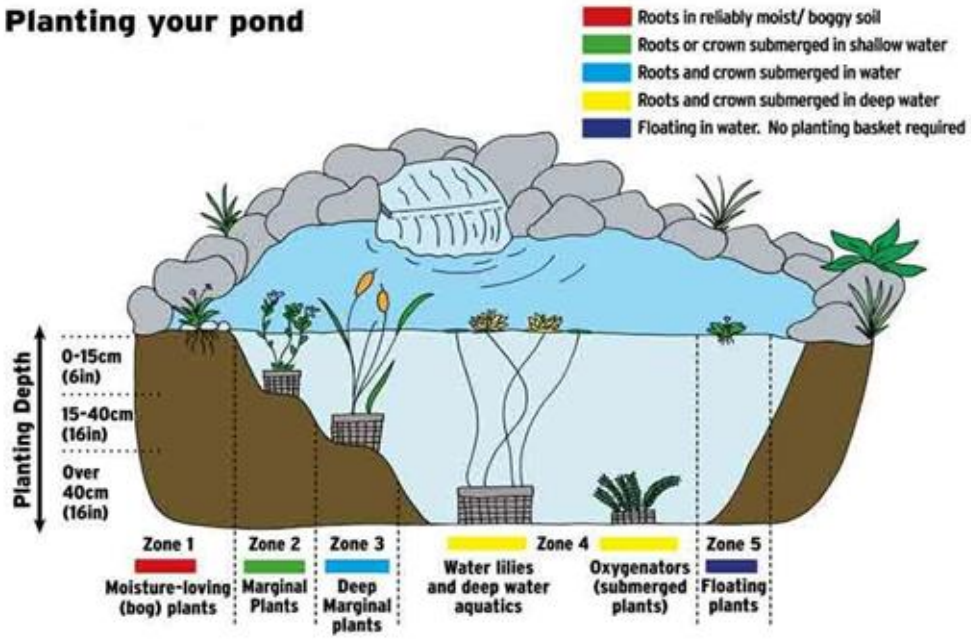
Storing tender Bulbs over winter

Pond and Bog Plants

- Pond Plants: Floating or submerged plants that may or may not root in soil
- Bog Plants: Grow in moist soil, but not standing water

Photo credit

Pond plants



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Ornamental Grasses

- Grasses and grass-like (i.e. rushes, sedges) plants excluding turf grass planted for ornamental purposes
- May be annual or perennial; evergreen or deciduous; warm or cool season; clumping or spreading
- Have few insect or disease problems



Photo: P. Turner, EMG

Consideration for Selection and Use of Ornamental Grasses

Ornamental Grasses

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Ferns

Plants without aerial stems (leaves arise directly from underground stem) that reproduce by spores and have neither seeds or flowers

Hardy Ferns



Photo: P. Turner, EMG

Succulents

Plants with fleshy leaves that store water







Photo credits: P. Turner, EMG

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[What are Cacti and Succulents]

Designing a Herbaceous Bed: Factors to Consider

Light

Temperature

Water

Soil Characteristics

Mulch



Photo credit



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Light

A mismatch of plant and light can lead to reduced flowering, leggy growth habit, burning of plants or stunting of growth



Duration: Time exposed to light;

- Full Sun: more than 3 hours of unfiltered sun per day
- Partial shade: receiving unfiltered morning sun with either shade during the afternoon hours or moderate shading throughout the entire day
- Heavy shade receives very little direct mid-day light and less than 60% of the sun's intensity during the remainder of the day

Intensity, strength of light; Low-light intensity will result in leggy, weak growth, and plants that don't flower or produce fruit

Temperature

For a full season of flowers, plant both cool season and warm season plants; Warm season plants prefer a soil temp over 60 degrees

- Cool season plants include: calendula, forget-me-not, bachelor buttons, diascia, larkspur, lobelia, nasturtium, impatiens, snapdragon, viola
- Warm season plants include: geranium, aster, gaillardia, cosmos, daylily, marigold, zinnia, verbena

Know average last killing frost dates in your area:

Zone 6a: May 5-15; Zone 6b: Apr 25-May 5; Zone 7a: Apr 15-25; Zone 7b: Apr 5-15; Zone 8a: Apr 5-15

Site specific temperatures:

- Northern Exposure: Least light, Coolest
- Eastern Exposure: Receives more light than northern exposure
- Western Exposure: Receives more light than northern exposure; Receives afternoon light; warmer than eastern exposure
- Southern Exposure: Most light; Warmest

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Virginia Planting Dates

Water

Do beds have sufficient drainage to avoid excess water?

Is a source of water nearby?

Soil Characteristics

Healthy soil is essential to healthy plants; the soil must supply water, anchorage, and nutrients

Don’t guess, Soil Test. Your local Virginia Cooperative Extension office can provide you with information on how to get your soil tested

Mulch

Mulching is covering the ground around plants with a protective material.

Purposes:

1. Suppress competing vegetation (weeds, grass)
2. Maintaining uniform moisture
3. Warm the soil
4. Reduce soil erosion
5. Modify soil temperatures (plastic mulches warm plants quicker in the spring)
6. Improve tilth (the state of aggregation of a soil especially in relation to its suitability for crop growth)
7. Provide nutrients (organic mulches)
8. Reduce rot and soil borne disease

Selection and Use of Mulches and Landscape Fabrics

More about Mulch

The purpose, availability, cost and appearance will determine which type of mulch you use

Organic Mulches:

- Include: bark, wood chips, sawdust, straw, pine straw, shredded leaves, newspaper
- An advantage of organic mulches is that they decompose, adding to the soil; a disadvantage is that they need to be replaced as they decompose

Inorganic Mulches:

- Include: crushed stone, gravel, volcanic rock, plastic, geotextiles
- Advantages include that they stay in place and do not rob soil of nitrogen; while it may be advantageous that they do not need replacing as often as organic mulches, they also do not contribute to the soil

Preparing the Bed

- Preparation of the bed is best done in the fall
- Get a soil test to determine if changes need to be made to the pH, if fertilizer needs to be added, and if additional organic matter should be added, it should be done before adding fertilizer
- Check drainage. Dig a hole 10” deep and fill with water. The next day, fill with water again and see how long it remains. It should not exceed 8 hours. If drainage is poor, raise the bed
- Add 4-6 inches of organic matter and dig in to 12-18 inches
- In the spring, add fertilizer, if needed, and turn the soil

Guidelines for Planting a Herbaceous Bed

- Site location is more important for perennials than annuals since these plants will be in the soil for several years
- Plant in clumps rather than one individual plant
- Soil preparation is very important to long time survival of plants
- Keep purpose in mind when selecting plants: edging, accents, masses of color, specimens
- Select plants that are compact and dark green; Avoid buying plants that have thin, pale, yellow stems and leaves
- Buy named varieties known for disease resistance, heat and cold resistance, growth habits and colors
- If planting seeds, start them in a vermiculite filled furrow rather than directly into garden soil
- Fertilize around plants when planting (16-12-10) to stimulate root growth and lightly (5-10-5) at 6-week intervals; always water after fertilizing
- (16-12-10 refers to percentages of nitrogen, phosphorus, and potassium respectively)

Maintaining a Herbaceous Bed

- If seeds were planted in the bed, plants may need to be thinned to the recommended spacing to allow enough light, water and nutrients and space to develop
- Plan to water plants from the beginning; water deeply, but don't let it get soggy. Let the bed get dry before watering again. Soaker hoses are more efficient than sprinklers for watering. Water at base of plant so leaves stay dry
- Use mulch but don't pile deeply around the crown of plants
- Pull weeds by hand, rather than use cultivation tools which can damage feeder roots
- Deadhead (remove old flowers and seed pods) to maintain plant vigor; disbud (remove small side buds to get larger blooms)

Maintaining a Herbaceous Bed

- Stake plants as needed; stake 6-12 inches below the final height of the plant. Tie plants to stakes by making a double loop of a wire or rope with one loop around the plant and the other around the stake. Never loop the tie around both stake and plant.
- Watch for insect pests. Most will not require chemical treatment. However, if a significant infestation occurs use insecticides recommended for the specific pest. Common pests include spider mites, aphids, Japanese beetles, lacebugs and thrips
- The short life span of annuals means they are seldom bothered by diseases. However, if a disease develops make sure it is correctly identified before a treatment is determined and make sure any pesticides used are handled carefully

Pests

Only about 15% of the nearly 2000 insects that could attack your annuals, perennials, and biennials are actually injurious or potentially destructive.

It is important to understand the life cycle and habits of the specific pest in order to know how to manage it.

Prevention is the Best Treatment:

- Select resistant plant varieties
- Plant in correct site
- Remove spent flowers, dead leaves, and other plant litter
- Know major pests for each plant grown
- Correctly diagnose the problem
- Treat as they arise with the least toxic treatment possible

Insects Common to Annuals and Perennials

Insect

1. Aphids

Sucking insect;

May transmit diseases



Photo credit

Aphids

2. Snails & slugs



Photo credit

Management

1. Avoid insecticides (kills natural enemies); keep plant healthy; hand pick; horticultural oil, or soap

2. Clean up debris; drip irrigation to reduce humid spots; handpicking; traps; barriers

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Insects Common to Annuals and Perennials

Insect

3. Japanese beetle

Japanese Beetle



4. Spider mites cause stippling (sandblasted appearance)

Spider Mites



Photo credit: osu.edu

Management

3. Milky spore; nematodes; traps; hand pick; systemic insecticide, such as imidacloprid in May or June

4. Winter or early spring use: dormant oil, summer use: miticide, or insecticidal soap

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Insects Common to Annuals and Perennials

Insect

5. Lacebugs (egg hatch in May)



Photo credit: Green Lacewing eating a lacebug nymph

6. Thrips

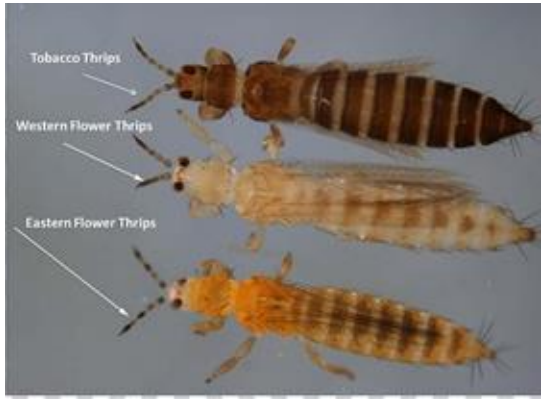

Photo credit

Management

5. Tolerate damage when possible; encourage predators; provide afternoon shade; horticultural oil; insecticidal soap; use resistant varieties; any insecticide may help

6. Good cultural practices; conserve natural enemies; prune; weed; row covers; no pesticide provides complete control

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Pest Management Guide (PMG)

Virginia Tech's Pest Management Guide (PMG) for Home Grounds and Animals is useful to home gardeners in managing pests in their gardens.

The PMG provides an index of insects that is useful in identifying those that are common, injurious or require control treatments.

The Pest Management Guide provides a list of insects by host and a table of control measures for major pests and pest groups.

The current PMG can be found on ramga.org > class.

Landscaping with Herbaceous Plants

The first step in planning a flower bed / border that will serve all seasons is to consider line, mass, color and dependability.

1. Line. Silhouette or outline

   Principles of landscape design

2. Mass. Shape or denseness; Establish plants in groups large enough to form masses of color or texture (5-7 plants); Each group of flowers should have an irregular shape

Drifts: Elongated groupings of a plant that flow through sections of the border

Clumps: Circular groupings of a variety or a single large plant such as a peony

Landscaping with Herbaceous Plants

3. Color. Includes range and depth of color; Color is the most powerful of design elements.

4. Dependability. Ability to remain attractive with a minimum of problems

Some Guidelines for Landscaping with Herbaceous Plants

Photo credit



The most attractive beds / borders have a background. This might be a fence, shrubbery or a building. You can also use taller plants as the background

Avoid a ruler straight front edge. For curved edges, the deeper the curve, the slower the eye moves, and the greater will be the visual enjoyment

Photo credit



Photo credit



Place taller flowers in the back, medium height species in the middle and dwarf varieties in the front; however, don't make strict demarcations between; Let a few tall plants extend into the medium height group to lead the eye back into the border

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Some Guidelines for Landscaping with Herbaceous Plants

- Allow adequate space between plants; don’t crowd them
- Single plants of different varieties should not be used as it gives a jumbled look
- Do not set plants in precise rows, but in groups
- Be bold, even if mistakes result; Flowers are easy to move

Choosing Plants

Four considerations in choosing plants:

1. Location: Amount of sun and shade; water required; slope and soil type

2. Period of bloom: Consider how long each plant stays in bloom and plan for a steady succession of blooms

Choosing Plants

3. Height and width

- Plant height in the bed should be 2/3 the width of the border (e.g. no plants taller than 4 feet in a border 6 feet wide)
- Tall spired type flowers (hollyhock, gladiolus) should be spaced about ¼ as far apart as their mature height
- Tall bushy plants should be spaced about ½ as far apart as their mature height
- Rounded, bushy annuals and perennials should be spaced about as far apart as their mature height. Creeping groundcover plants may be spaced about twice as far apart as their mature height



Photo credit

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Choosing Plants

4. Color

- There is a large range of colors in flowers; Your bed may be of the same color, closely related colors, or wildly different colors
- Hues are modifications of color such as orange-red
- Intensity is vividness of color (e.g. light tones placed next to dark ones)
- Placement of color is also important:
  - White is especially good near patios because it shows up well in the evening or dusk when patios are often in use
  - Deep pure red clashes with most other colors unless softened by dark green foliage
  - White and gray foliage are helpful to separate conflicting colors
  - Red, orange and yellow are warm colors
  - Blue green and violet are cool colors
  - The use of cool colors gives the impression of openness and space, so the smaller the space, the fewer warm colors should be used

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Color in the Landscape

Elements of Design

There are no hard and fast rules in designing your landscapes and the beds within that landscape. However, following certain principles may make the results more pleasurable to you

There are many Principles of design described in the literature. Some include:

Scale	Balance	Unity
Rhythm	Simplicity	Accent
Repetition	Line	Transitions

Click on the websites below to learn more about the elements of design.

There is a separate module on Landscape Design that covers this content.

Principles of Design

Herbs

- While herbs could be covered either in the module on vegetables, or in the module on herbaceous plants, we have chosen to describe them here.

Herbs:

- Can be grown successfully with minimum effort
- Prefer full sun, good air circulation and well-drained soil

Photo Credit: P. Turner, EMG



Herbs

- pH 6.3 – 6.8 for optimal growth. Lavender = 6.5 – 7.0
- Plant where they will not be disturbed
- Tender perennials need mulch protection in the winter
- Periodic irrigation during dry periods
- Thorough watering preferred to frequent watering
- Rapid growth dilutes the concentration of essential oils

Herbs

- Inadequate fertilization severely limits new growth & predisposes the plant to pests & increases winter injury susceptibility
  - Light application in early spring
  - ¼ to ½ nitrogen recommended for vegetables
- Periodic, judicious pruning promotes vigorous, sturdy plants
- Harvest herbs in the morning, just after the dew has dried, but before the sun gets hot; essential oils are highest
- Drying: Just before bloom

Herb Culture and Use

Herbs

Sage

- Mint family; Pleasant aromatic odor
- Warm, slightly bitter taste
- Plant seeds ¼” deep in full sun & rich well drained soil



30. Photo: P. Turner. EMG

- ***Fennel***
- Dried fruit in Parsley family
- Tiny yellowish-brown seeds
- Licorice flavor
- Plant seeds ¼” deep in full sun & rich well-drained soil
- Leaf clippings can also be frozen



Photo credit Illinois.edu

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Herbs

Photo: P. Turner, EMG



- ***Tarragon***
- Pungent flavor resembling licorice
- Plant in full to partial shade, just covering the roots
- Do not crush or grind until ready to use

Photo credit



Thyme

- Mint Family
- Short brown leaves
- Warm aromatic odor; Pungent flavor
- Plant sees in full to partial shade 0 – ¼” deep
- Do not crush or grind until ready to use

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Herbs

- ***Parsley***
- Tiny green leaf; Grows in clusters on low plant
- Mild, slightly tangy flavor
- Plant seeds deep in full or partial shade
- To keep productive: cut back the full length of the outside stems & remove all flower heads
- Do not crush or grind until ready to use



Photo: P.Turner, EMG

- ***Dill***
- Fruit in Parsley Family
- Aromatic odor
- Delicate caraway flavor
- Plant seeds in full sun, protected from the wind about ¼ - ½" deep
- Do not crush or grind until ready to use

Photo credit



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Herbs

- ***Basil***
- Mint family
- Mild aromatic odor
- Warm, sweet flavor with slight licorice taste
- Plant seeds in protected, full sun site about ¼" deep
- Pick continuously before flower buds open; encourages bushy growth



Photo: P. Turner, EMG

Garlic Chives
Photos: P. Turner, EMG



Common Chives



Chives

Photo credit

- Small green tube-like leaves
- Cut from outside of plant as needed
- Can be frozen
- Kinds:
- Common: *Allium schoenoprasum*
- Garlic: *Allium tuberosum*
- Giant Siberian: *Allium ledebourianum*
- Siberian garlic: *Allium nutans*

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End of Slide Set

This is the end of the slides on Herbaceous plants.

You can continue to next slide: ‘Suggested Readings’ OR

Click on the house in the lower right corner below to return to the Navigation Page

Suggested Readings

Note: While there are many websites outside of our Virginia Cooperative Extension resources that have good information, that information may not be applicable for your geographic area. This is especially true regarding the life cycle and treatment times for insects.

Chapter 3 MG Handbook

Test Your Knowledge

Click on the knowledge test you want to try

Deer Resistant Perennials

Use PMG

Cultivars of Love

Apply What You Have Learned

Help Desk Quiz

Drink to these Perennials

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Apply What You Have Learned

1. Describe the qualities of light in a flower bed on your property
2. Test the drainage of the soil where you have flowers planted
3. Get a soil test and describe changes you might want to make based on the results
4. Identify 2 'good guy' insects on your annuals/perennials
5. Using the four considerations for choosing plants (location, period of bloom, height and width, and color) design (on paper) a flower bed for your yard / garden

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Click to Return to 'Test Your Knowledge'

Deer Resistant Perennials

If you can unscramble the following genus names for the perennials, you will have learned some deer "resistant" perennials. Answers on next slide.

1. Aeachill
2. Lamiul
3. Pabsitai
4. Suthniad
5. Beuphoria
6. Naregium
7. Siri
8. Rethoonea
9. Prkuseoia
10. canivore

Photo credit: P. Turner, EMG



Click to Return to 'Test Your Knowledge'

Note: If hungry enough, deer will eat almost anything

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Deer Resistant Perennials Answers

1. Aeachill
2. Lamiul
3. Pabsitai
4. Suthniad
5. Beuphoria
6. Naregium
7. Siri
8. Rethoonea
9. Prkuseoia
10. canivore

1. Achillea
2. Allium
3. Baptisia
4. Dianthus
5. Euphorbia
6. Geranium
7. Iris
8. Oenothera
9. Perovskia
10. Veronica



Note: If hungry enough, deer will eat almost anything

Click to Return to 'Test Your Knowledge'

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Cultivars of Love

Match the cultivars on the right with the appropriate descriptions on the left

(Answers on next slide)

1. Hosta, blue quilted leaves, pale lavender flowers early, medium size
2. Hosta, green with dark green and jagged margins
3. Hosta, 1996 hosta of the year, glossy green leaves, wide creamy edges
4. Daylily, gold flowers, dark maroon eye, rebloomer, tetraploid
5. Peony, double pink
6. Sedum, mats of blue leaves, pale pink flowers in spring
7. Sempervivum, deep purple foliage with slight green in centers
8. Sempervivum, green foliage tipped with deep red
9. Fountain grass, silver variegated, short
10. New England aster, white flowers
11. Turtlehead, rose flowers late

a. Obsession
b. Love Pat
c. So Sweet
d. Love's Triangle
e. Exotic Love
f. Purple Passion
g. Pillow Talk
h. Wedding Lace
i. Ruby Heart
j. Hot Lips
k. Little Honey

Credit: U of Vermont, 2023

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Click to Return to 'Test Your Knowledge'

Cultivars of Love Answers

1. Hosta, blue quilted leaves, pale lavender flowers early, medium size
2. Hosta, green with dark green and jagged margins
3. Hosta, 1996 hosta of the year, glossy green leaves, wide creamy edges
4. Daylily, gold flowers, dark maroon eye, rebloomer, tetraploid
5. Peony, double pink
6. Sedum, mats of blue leaves, pale pink flowers in spring
7. Sempervivum, deep purple foliage with slight green in centers
8. Sempervivum, green foliage tipped with deep red
9. Fountain grass, silver variegated, short
10. New England aster, white flowers
11. Turtlehead, rose flowers late

a. Obsession
b. Love Pat
c. So Sweet
d. Love's Triangle
e. Exotic Love
f. Purple Passion
g. Pillow Talk
h. Wedding Lace
i. Ruby Heart
j. Hot Lips
k. Little Honey

1. B. Love Pat
2. A. Obsession
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Drink to these Perennials

Some perennials are named after popular drinks and beverages, often from the resemblance of their leaf colors. Can you identify them, matching names with descriptions? *Answers on next slide*

1. Ginger Ale
2. Lime Rickey
3. Southern Comfort
4. Merlot
5. Blackberry Wine
6. Plum Wine
7. Orange Punch
8. Sangria
9. Peppermint Schnapps
10. Brandy Punch

a. Heuchera, light yellow leaves

b. Hibiscus, round pink flowers with red throat

c. Heuchera, chartreuse ruffled leaves

d. Hibiscus, rose-red large flowers

e. Heuchera, cinnamon peach to copper leaves

f. Crinum, dark purple reflexed leaves, rose-pink flowers

g. Echinacea, 5 in. flowers rose pink, dark red-black stems

h. Canna, orange flowers in pendant racemes

i. Corydalis, blue-green leaves, purple flowers

j. Campanula, silvery gray-blue leaves, pink bell flowers

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Drink to these Perennials Answers

1. Ginger Ale
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1. A
2. C
3. E
4. G
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6. J
7. H
8. F
9. D
10. B

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Quiz

Answers on next slide

1. Hollyhocks with yellowing leaves with spots and bumps. Caller was vague on describing spots & bumps. Suggested she bring in several leaves for ID.
2. Peace Lily - leaves have turned yellow and falling off. New leaves are very light green and stems look fragile. Problem began after re-potting in miracle grow potting soil. Plants are older ones. Does not desire to use synthetic chemicals for treatment.
3. Can potted peonies be planted in ground now (August)?
4. Rhododendron - leaves yellowing, brown, defoliation occurs.

Quiz Answers

1. Hollyhocks with yellowing leaves with spots and bumps. Caller was vague on describing spots & bumps. Suggested she bring in several leaves for ID.

Answer: Hollyhock Rust. Remove the diseased leaves. After flowers die down cut down and burn the diseased plants. Client advised to clean this area thoroughly in the fall.

2. Peace Lily - leaves have turned yellow and falling off. New leaves are very light green and stems look fragile. Problem began after re-potting in miracle grow potting soil. Plants are older ones. Does not desire to use synthetic chemicals for treatment.

Answer: Nitrogen deficiency. Plant should be re-potted in regular potting soil. Recommended dividing plants. Suggested giving plant nitrogen by using dried blood meal, followed by bi-weekly watering with fish emulsion.

3. Can potted peonies be planted in ground now (August)?

Answer: Yes, but you might have to tease out roots from the pot before planting. Water well after planting in ground.

4. Rhododendron - leaves yellowing, brown, defoliation occurs.

Answer: Based on description and questions & answers: possible iron deficiency, pH problem: 5-6 pH best for Rhododendron's. Also, possible herbicide issue: lawn weed & feed was applied very near plants / Roundup has also been used. Soil test; bring stem/leaf sample; remove dead plant and examine roots; may need to bring in root sample as well.

Use the PMG

Using the PMG as a reference, what controls / treatments would you recommend for Japanese beetles on perennials?

The answer is on the next side, however, use the PMG and try to figure this out before looking at the answer.

Use the PMG

- Using the PMG as a reference, what controls / treatments
- Go to the PMG (Current copy available on ramga.org > Class), Scroll down to the Chapter on Home Ornamentals
- Table describes control measures for Japanese beetles
- Acetamiprid; Bifenthrin; Malathion; Esfenvalerate; Imidacloprid; Permethrin; Clothianidin
- Deltamethrin; Lambda-Cyhalothrin; Gamma-cyhalothrin; Thiamethoxam; Zeta-Cypermethrin
- **Timing of pesticide treatment**: In late June or early July after adults have begun to congregate on selected hosts. Repeat as necessary into August. For imidacloprid, see "Bee Advisory Box". **Remarks**: Since adults actively fly and move continuously, they seem to be present constantly even where treatments have been applied. Treat with Imidacloprid in spring when new growth starts. **Biological controls**: Nematodes (*Steinernema*), Milky spore (*Bacillus popillae*) can be used for turf application to suppress grubs but are slow acting. Traps with floral lures and sex attractants can be placed in landscape but it is possible to attract more beetles than were originally in the area if there is not a larger effort to reduce amounts. **Cultural controls**: Plant resistant plant species. Remove diseased fruit from trees and ground and maintain good sanitation. In early stages, picking off bugs by hand helps, or shake branches early in the morning when insects are sluggish. Drop insects into soapy water to kill.