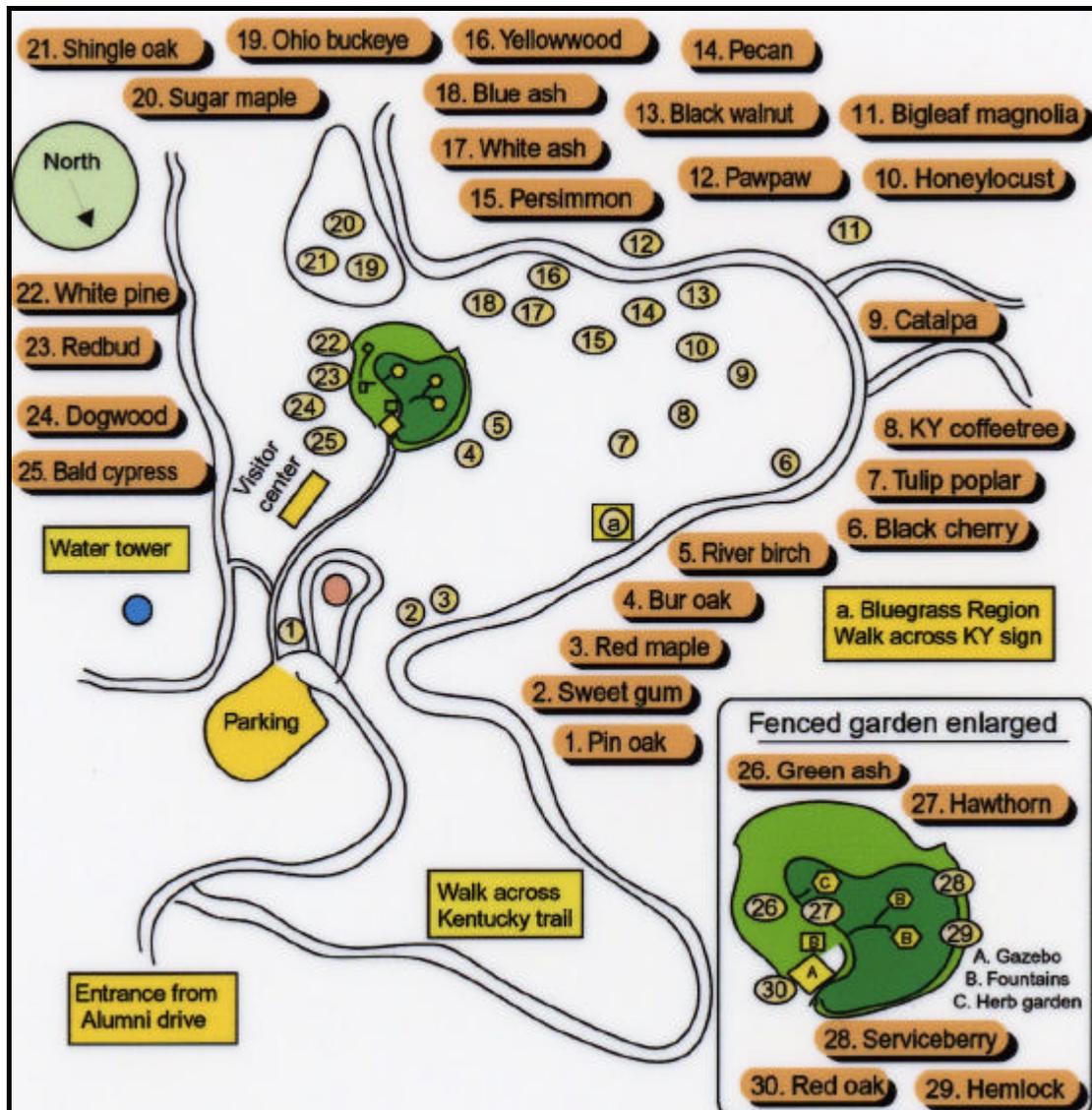


## Dichotomous Keys for the Arboretum Walk

### Plant List

<u>Common name</u>	<u>Latin name</u>
1. Pin oak	<i>Quercus palustris</i>
2. Sweet gum	<i>Liquidambar styraciflua</i>
3. Red maple	<i>Acer rubrum</i>
4. Bur oak	<i>Quercus macrocarpa</i>
5. River birch	<i>Betula nigra</i>
6. Black cherry	<i>Prunus serotina</i>
7. Tulip poplar	<i>Liriodendron tulipifera</i>
8. Kentucky coffeetree	<i>Gymnocladus dioicus</i>
9. Catalpa	<i>Catalpa speciosa</i>
10. Honeylocust	<i>Gleditsia triacanthos</i>
11. Bigleaf Magnolia	<i>Magnolia macrophylla</i>
12. Pawpaw	<i>Asimina triloba</i>
13. Black walnut	<i>Juglans nigra</i>
14. Pecan	<i>Carya illinoensis</i>
15. Persimmon	<i>Diospyros virginiana</i>
16. Yellowwood	<i>Cladrastus kentuckea</i>
17. White ash	<i>Fraxinus americana</i>
18. Blue ash	<i>Fraxinus quadrangulata</i>
19. Ohio buckeye	<i>Aesculus glabra</i>
20. Sugar maple	<i>Acer saccharum</i>
21. Shingle oak	<i>Quercus imbricaria</i>
22. Eastern white pine	<i>Pinus strobus</i>
23. Eastern redbud	<i>Cercis canadensis</i>
24. Flowering dogwood	<i>Cornus florida</i>
25. Bald cypress	<i>Taxodium distichum</i>
26. Green ash	<i>Fraxinus pennsylvanica</i>
27. Cockspur hawthorn	<i>Crataegus crus-galli</i>
28. Downy serviceberry	<i>Amelanchier arborea</i>
29. Hemlock	<i>Tsuga canadensis</i>
30. Northern red oak	<i>Quercus rubra</i>

### Native tree walk map



## Winter Key

- (1) Are the trees evergreen (go to 2) or deciduous (go to 3)?
  - (2) Are the leaves attached to the stem (go to 2a) as or in needle bundles (go to 2b)?
    - 2a Hemlock (*Tsuga canadensis*)
    - 2b Eastern white pine (*Pinus strobus*)
  - (3) Are the buds in an opposite or whorled arrangement on the stem (go to 4) or are they alternate (go to 15)?
    - (4) Are the buds in a whorled (go to 5) or opposite (go to 6) arrangement on the stem?
      - (5) Catalpa (*Catalpa speciosa*)
      - (6) Are the leaf scars large with many bundle traces (go to 7) or are they small with three or less traces (go to 12)?
        - (7) Is the terminal bud large and pointed with numerous bud scales (go to 8) or is it small and round with only a few bud scales (go to 9)?
          - (8) Ohio buckeye (*Aesculus glabra*)
          - (9) Do the stems have square ridges (go to 10) or are the stems round (go to 11)?
            - (10) Blue ash (*Fraxinus pennsylvanica*)
            - (11) Is the leaf scar U-shaped and partially around the bud (go to 11a) or is it half moon-shaped and under the bud (go to 11b)?
              - (11a) White ash (*Fraxinus americana*)
              - (11b) Green ash (*Fraxinus pennsylvanica*)
          - (12) Are the large and easily seen (go to 14) or are they small except for the rounded flower buds on short stalks (go to 13)?
            - (13) Flowering dogwood (*Cornus florida*)
            - (14) Do the vegetative buds have hairs present at the tip and 8 brown scales (go to 14a) or are there no hairs and 6 reddish scales (go to 14b)?
              - (14a) Sugar maple (*Acer saccharum*)
              - (14b) Red maple (*Acer rubrum*)
      - (15) Are some of the scars on the stem rounded without a bud on top of the scar (go to 16) or do all scars have a bud located on top of the scar go to (17)?
        - (16) Bald cypress (*Taxodium distichum*)
        - (17) Do the stems have thorns (go to 18) or are there no thorns on the stem (go to 19)?
          - (18) Are the thorns branched and the terminal bud difficult to see (go to 18a) or are the thorns unbranched and the terminal bud easily seen (go to 18b)?
            - (18a) Honeylocust (*Gleditsia triacanthos*)
            - (18b) Cockspur hawthorn (*Crataegus crus-galli*)
    - (19) Are there catkins on the branches (go to 20)? Otherwise go to (21).
      - (20) River birch (*Betula nigra*)
      - (21) Does the terminal bud have only one scale and a stem with bud scars that circle the stem (go to 22) or does the terminal bud more than one scale (go to 23)?

- (22) Is the terminal bud pointed (go to 22a) or flat like a duck's bill (go to 22b)?
- (22a) Bigleaf magnolia (*Magnolia macrophylla*)
- (22b) Tulip poplar (*Liriodendron tulipifera*)
- (23) Does the stem tip have a cluster of three or more buds (go to 24) or is there a single terminal bud (go to 31)?
- (24) Do the leaf scars have three lobes each containing a single bundle trace (go to 25) or are the leaf scars without lobes (go to 26)?
- (25) Black walnut (*Juglans nigra*)
- (26) Are the buds broad with gray scales (go to 27) or pointed with red scales (go to 28)?
- (27) Bur oak (*Quercus macrocarpa*)
- (28) Is the terminal bud large (>5mm), dark reddish brown with silver hairs at the tips (go to 29) or small (go to 30)?
- (29) Northern red oak (*Quercus rubra*)
- (30) Are the stem tips smooth and reddish brown (go to 30a) or fuzzy and silver gray (go to 30b)?
- (30a) Pin oak (*Quercus palustris*)
- (30b) Shingle oak (*Quercus imbricaria*)
- (31) Is there a single terminal bud (go to 32) or is the terminal bud difficult to see or absent (go to 33)?
- (32) Are the stems thick with large leaf scars (go to 32a) or are the stems slender with a zig-zag shape (go to 32b)?
- (32a) Kentucky coffeetree (*Gymnocladus dioica*)
- (32b) Honeylocust (*Gleditsia triacanthos*)
- (33) Are the buds hairy (go to 34) or are they smooth (go to 41)?
- (34) Do the buds have reddish scales with silver hairs at the tips (go to 35) or are there no silver hairs at the tip (go to 36)?
- (35) Downy serviceberry (*Amelanchier arborea*)
- (36) Are the buds covered with purple velvety hairs (go to 37) or are they not purple (go to 38)?
- (37) Pawpaw (*Asimina triloba*)
- (38) Does the leaf scar round and circle the bud (go to 39) or is it lobed and under the bud (go to 40)?
- (39) Yellowwood (*Cladrastus kentuckea*)
- (40) Are the buds pointed (go to 40a) or round (go to 40b)?

(40a) Pecan (*Carya illinoensis*)

(40b) Walnut (*Juglans nigra*)

(41) Are the buds shiny and do the stems have corky ridges (go to 42) or are the stems smooth (go to 43)?

(42) Sweet gum (*Liquidambar styraciflua*)

(43) Do the stems have felt-like hairs with pointed buds that have only two overlapping bud scales (go to 44) or are the stems smooth with numerous bud scales (go to 45)?

(44) Persimmon (*Diospyros virginiana*)

(45) Do the stems have a zig-zag pattern (go to 46) or are they straight (go to 47)?

(46) Eastern redbud (*Cercis canadensis*)

(47) Is the leaf scar round and circle to bud or (go to 47a) and is the leaf scar small and under the bud with an unpleasant odor when the stem is broken (go to 47b)?

(47a) Yellowwood (*Cladrastus kentuckea*)

(47b) Black cherry (*Prunus serotina*)

## Summer Key

- (1) Are the leaves needle-like (go to 2) or are they broad (go to 5)?
  - (2) Are needles attached to the stem in bundles (go to 3) or are they attached singly directly to the stem (go to 4)?
    - (3) Eastern white pine (*Pinus strobus*)
    - (4) Do the undersides of the leaves have a white stripe (go to 4a) or are the leaves uniformly green (go to 4b)?
      - (4a) Hemlock (*Tsuga canadensis*)
      - (4b) Bald Cypress (*Taxodium distichum*)
  - (5) Are leaves attached to the stem in an opposite or whorled arrangement (go to 6) or they in an alternate arrangement (go to 17)?
    - (6) Are the leaves mostly in a whorled arrangement (go to 7) or are they strictly opposite (go to 8)?
      - (7) Catalpa (*Catalpa speciosa*)
      - (8) Are the leaves simple (go to 9) or compound (go to 12)?
        - (9) Are the non-lobed (go to 10) or lobed (go to 11)?
          - (10) Flowering dogwood (*Cornus florida*)
          - (11) Do the leaves have 3 - 5 lobes with U-shaped sinuses (go to 11a) or do they have V-shaped sinuses and red color on the petiole (go to 11b)?
            - (11a) Sugar maple (*Acer saccharum*)
            - (11b) Red maple (*Acer rubrum*)
        - (12) Are the leaves palmately compound (go to 13) or pinnately compound (go to 14)?
          - (13) Ohio buckeye (*Aesculus glabra*)
          - (14) Do the young stems have ridges on the stem that makes them appear square (go to 15) or are the stems round (go to 16)?
            - (15) Blue ash (*Fraxinus quadrangulata*)
            - (16) Does the leaf petiole completely surround the bud (go to 16a) or is the petiole beneath the bud (go to 16b)?
              - (16a) White ash (*Fraxinus americana*)
              - (16b) Green ash (*Fraxinus pennsylvanica*)
    - (17) Are the leaves compound (go to 18) or are the leaves simple (go to 26)?
      - (18) Are the leaves pinnately compound (go to 19) or bipinnately compound (go to 25)?
        - (19) Are the leaflets attached in an alternate pattern on the petiole (go to 20) or are they arranged in an opposite pattern (go to 21)?
          - (20) Yellowwood (*Cladrastus kentuckea*)
          - (21) Are the leaflets less than 1 inch long (go to 22) or are they greater than 1 inch long (go to 23)?
            - (22) Honeylocust (*Gleditsia triacanthos*)
            - (23) Is the leaflet at the very tip large (go to 23a) or is it small or absent (go to 24b)?
              - (23a) Pecan (*Carya illinoensis*)
              - (23b) Black walnut (*Juglans nigra*)
          - (24) Are the leaflets rounded at tip (go to 25a) or are the leaflets pointed at tip (go to 25b)

- (25a) Honeylocust (*Gleditsia triacanthos*)
- (25b) Kentucky coffeetree (*Gymnocladus dioica*)
- (26) Are the leaves lobed (go to 27) or non-lobed (go to 32)?
  - (27) Are the tips of the leaf lobes round (go to 28) or are they pointed (go to 29)?
    - (28) Bur oak (*Quercus macrocarpa*)
    - (29) Are there tufts of hair near the leaf veins on the underside of the leaf (go to 30) or are the leaf undersides without tufts of hairs (go to 31)?
      - (30) Do the main veins for each lobe connect at the petiole (go to 30a) or do they connect at the central vein in the middle of the leaf (go to 30b)?
        - (30a) Sweet gum (*Liquidambar styraciflua*)
        - (30b) Pin oak (*Quercus palustris*)
      - (31) Is the lobe missing at the tip of the leaf (go to 30a) or is there a lobe at the leaf tip (go to 30b)?
        - (31a) Tulip poplar (*Liriodendron tulipifera*)
        - (31b) Red oak (*Quercus rubra*)
  - (32) Are the leaf margins smooth (go to 33) or do they have a toothed edge (go to 38)?
    - (33) Are the leaves less than 8 inches long (go to 34) or greater than 8 inches long (go to 36)?
      - (34) Are the leaves heart-shaped (go to 35) or are the leaves oval to elongate (go to 36)?
        - (35) Eastern redbud (*Cercis canadensis*)
        - (36) Do the leaves have a short petiole and an oblong leaf with a bristle at the tip (go to 36a) or are the petioles long, fuzzy and the leaf oval-shaped (go to 36b)?
          - (36a) Shingle oak (*Quercus imbricaria*)
          - (36b) Persimmon (*Diospyros virginiana*)
      - (37) Are the leaves 8 to 12 inches long (go to 37a) or are they 12 to 30 inches long (go to 37b)?
        - (37a) Pawpaw (*Asimina triloba*)
        - (37b) Bigleaf magnolia (*Magnolia macrophylla*)
  - (38) Are some of the teeth on the leaf margins larger than others (go to 39) or are they all the same and the same uniform size (go to 40)?
    - (39) River birch (*Betula nigra*)
    - (40) Are there thorns on the stems (go to 41) or are there no thorns on the stems (go to 42)?
      - (41) Cockspur hawthorn (*Crataegus crus-galli*)
      - (42) Are there glands on the leaf petiole and do the stems have lenticles (go to 42a) or are the petioles and stems smooth (go to 42b)?
        - (42a) Black cherry (*Prunus serotina*)
        - (42b) Downy serviceberry (*Amelanchier arborea*)