# Florida 4-H Horticulture Identification and Judging Study Manual - Rules and Glossary ${ }^{1}$ 

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Horticulture is the art and science of growing fruits, vegetables, flowers and ornamental plants. It is a profession, a vocation, an avocation, an industry, and a way of life for millions of people. Horticulture is very important to Florida's economy and is vital to everyone's health and well-being.

This is a study guide for Florida 4-H members interested in horticulture and particularly in the Florida 4-H Identification and Judging Contest. Included are fruits, vegetables and ornamental plants important to Florida's society and agricultural economy. This event is patterned after the National Junior Horticulture Association (NJHA) contest, with modifications made to align it more closely with horticulture in Florida.

The purpose of the contest is to acquaint 4-H members with horticultural plants and their useful parts and products. Participation in this event should result in improved abilities to select, buy, use, grow, sell and appreciate the offerings of horticulture.

## ELIGIBILITY

1. Participants must comply with all $4-\mathrm{H}$ rules and regulations governing county, district and state events.
2. Contestants are urged to participate first at the local and county level, but district elimination is not
required in this event. Each county may enter one team in the state event conducted during the $4-\mathrm{H}$ State Congress.
3. A team consists of 3 to 4 members (only the top 3 scores are added for total team scores). Team members must work independently.
4. Members of the state winning team in any year are not eligible for further competition in the state event.

## IDENTIFICATION

The identification section of the contest includes 4 groups of plants: fruits and nuts, vegetables, flowers and foliage plants and ornamentals. Each group contains 45 plants and participants are responsible for knowing all 180, although only 35 specimens from each group (140 total) will be in the contest. Specimens are grouped and labeled according to category. Items shown may be the plant, plant parts, or plant products. There are no duplications on the contest.

Two score sheets are used for the identification section, 1 for fruits and vegetables and 1 for flowers and foliage plants and ornamentals. Each score sheet lists all plants in those sections with a letter designation (a-ss) corresponding to each. Blank spaces, numbered 1-35, are listed beside each column of plant names. The contestant must write the appropriate letter designation

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for each plant included in the contest in the numbered space provided on the score sheet. Each item counts 5 points for a total possible score of 700 on the identification section.

## JUDGING

Eight classes of horticultural plants or produce are judged as follows:

## 1. Two classes of fruits.

2. Two classes of vegetables.
3. Two classes of flowers and /or foliage plants.
4. Two classes of ornamental plants.

Each class consists of 4 specimens of groups of specimens, lettered A-B-C-D from left to right. Mentally arrange the specimens in order of highest to lowest overall quality and mark them in the appropriate space on the judging scoresheet in the column labeled "Placing".

Judging counts 200 points, with 25 points per class. Because $100 \%$ is considered correct placing, scoring will be done on the basis of $100 \%$ and the final score is determined by dividing the sum total of percentages scored by 4 to obtain the final total points scored. For example, when all 8 classes are placed correctly, the scoring is as follows:
$100 \% \times 8=800 \div 4=200$ points scored.

## Judging Fruits and Vegetables

Specific considerations on judging the 90 possible classes of fruits and vegetables is beyond the scope of this manual. However, some general guidelines are presented to help you better recognize high-quality fruits and vegetables and rank each class accordingly.

Judging fruits and vegetables is simply a matter of making choices. Consumers buy fruits and vegetables at the market by selecting those most appealing to them on the basis of external quality and past experience. Visit produce markets or produce sections of grocery stores to examine fruits and vegetables. Try to identify the best quality produce and determine why some produce is of inferior quality. Notice that almost everyone "selects" fruits and vegetables - they don't just take the first ones or closest ones. The key is learning, through experience, how to select the best produce.

Judging fruits and vegetables is based on common sense factors. The following criteria should be used when evaluating the quality of produce:

1. A specimen should be properly identified as to variety, or cultivar. For example, if you think you are purchasing a 'McIntosh' apple, you will probably not be satisfied with a red 'Delicious' apple.
2. Specimens should be fresh and at the optimum stage of maturity for eating. Produce that is overmature or immature is downgraded.
3. Specimens should be clean and free from insects and diseases or any damage caused by such pests.
4. Specimens should be free of bruises and blemishes. Although many surface blemishes do not affect eating quality, they do reduce eye appeal.
5. Specimens within a plate should be uniform in size, shape, color and type. Each plate within a class will have the same number of specimens.

When grading, first visualize the ideal specimen. Then consider all departures from this based on the above criteria, and common sense. Factors which affect usefulness are downgraded more than other factors. For example, severely overripe bananas would be ranked below bananas with slight abnormalities in size or shape. The plate with the most defects and serious faults should receive the lowest ranking. It is usually best to identify the worst group (plate) within a class first. Then pick the best of the remaining three groups. Finally, try to place the final two groups in rank order.

In our scoring scheme, the correct selection of the best group or specimen within a class is worth $76 \%$ of the total score for that class regardless of how the other 3 groups are ranked. By correctly placing the best and worst groups (specimens) within a class, the contestant earns $88 \%$ of the possible points for that class.

## Judging Flowers and Foliage

Flowers are divided into 2 categories for judging purposes: cut flowers and pot plants.

Cut flowers can be divided into 2 main shapes: spike and round. The gladiolus and snapdragon are examples of spike flowers and the rose and chrysanthemum are examples of round flowers.

When judging spike flowers, look for long spikes with the most open florets. The bottom florets should show no signs of over-maturity in the form of browning around the edges, shriveling or fading of color. Spikeform flowers should be just single spikes with no secondary side shoots.

Maturity is an important factor when judging roundform flowers. The center petals must not be so tight and immature as to be green, but they should be tighter than the outer petals. The outer petals should begin to turn down, but show no signs of wilting and drying.

Spike or round flowers in the same class should be of one variety or cultivar and have typical characteristics of that variety. Flowers should be free of irregularities, spray residue and blemishes due to insect, disease or mechanical injury. Stems should all be the same length, straight and strong enough to support the flower head without bending. Foliage should be clean, fresh and a bright shade of green.

Size of bloom, symmetry, color, freshness, arrangement of petals and true-to-variety flower shape are other important points to consider when judging flowers.

Potted flowering plants should be short, compact, well-shaped plants having dark green foliage with flower buds just beginning to show color or perhaps with a few buds open. Specimens having the most flower buds are normally more desirable.

Judging foliage plants is similar to judging potted plants, but much more attention should be given to the quality of the foliage. The size, color and number of the leaves as well as the size and shape of the plant and whether it appears to be growing, are all criteria to consider.

## Judging Ornamentals

When judging ornamentals, look for a healthy, vigorous plant which is very well shaped, heavily branched, and densely foliated. Density and condition of the plant are more important qualities than the physical measurement, or height. A shrub with a number of stocky, well-shaped branches is of better quality than one with long, thin branches.

Some factors that downgrade ornamental plants are:

1. Lack of health and vigor, or excessive succulence.
2. Canes or trunk(s) and branches:
a. Weak or poorly formed
b. Excessive scarring, scars not healed properly.
c. Poor graft unions not healing properly
d. Branches poorly distributed
e. Dead wood.
f. Cold damage.
3. Foliage:
a. Leaves of improper shape, size, texture and color.
b. Excessive chlorosis (yellowing) due to mineral deficiency or other causes.
c. Excessive pest or mechanical injury.
d. Dead leaves.
4. Root system:
a. Container-grown stock
i. Not well established in container.
ii. Excessively root bound.
iii. Large roots growing out of container.
iv. Weeds in container.
b. Balled and burlapped stock
i. Loosely established in ball.
ii. Ball soft or loosely tied.
iii. Ball too small or shallow.
iv. Weeds growing around trunk.

## GLOSSARY OF TERMS

## Terms Beginning with A-D

Achene Fruit Type: One-seeded fruit, often plumose; outer layer firmly atttached to the seed, dry indehiscent. See Figure 1.


Figure 1. Achene Fruit Type.


Figure 2. Alternate Leaf Arrangement.

Annual: A plant which completes its life cycle in one year.

## Alternate Leaf Arrangement:

One leaf at a node. See Figure 2.

Anther: The pollen bearing part of the stamen. See Figure 46.

Berry Type Fruit: A several seeded fruit with fleshy outer and inner walls; seeds imbedded in the pulpy mass; inner ovary wall fleshy and any hard coat around the seed does not belong to the ovary; fleshy fruit. See Figure 3.


Figure 3. Berry Type Fruit.

Bract: A more or less modified leaf situated near a flower.

Bud: Much-condensed, undeveloped shoot.

Calyx: Collective name of sepals.

## Campanulate Corolla

 Type: Bell-shaped, with a broad tube about as long or longer than broad and flaring lobes. See Figure 5.

Figure 5. Campanulate Corolla Type.

Column: A group of unified staminal filaments.

Compound Leaf: Composed of two or more similar parts.

## Convolute Leaf Margin: Rolled upward. See Figure 6.



Figure 6. Convolute Leaf Margin.

Blade: Expanded part of a leaf.
Bipinnate: Twice pinnate. See Figure 4.


Figure 4. Bipinnate.

## Cordate Leaf Shape:

Heart-shaped. See
Figure 7.

Corm: A thickened, vertical, solid underground stem.

Corolla: Collective name for petals.

Corona: An appendage or extension standing between the corolla and the stamen. Also called "crown".

## Corymb Flower

 Arrangement: An inflorescence consisting of a central rachis bearing a number of branced pedicels; the lower ones much longer than the upper, resulting in a flat or more or less round-topped cluster. See Figure 8.

Figure 7. Cordate Leaf Shape.

Cyme Flower Arrangement: An inflorescence consisting of a central rachis bearing a number of pedicelled flowers. See Figure 10.

Deciduous: A plant


Figure 10. Cyme Flower Arrangement. which sheds its leaves during certain seasons of the year.

## Deltoid Leaf Shape:

More or less equilaterally triangular. See Figure 11.


Figure 11. Shape.

Dentate Leaf Margin: Sharp teeth pointing outward from the midvein. See Figure 12.

Dioecious: Male and female flowers are borne on different plants.

Disk Florets: The regular tubular


Figure 12. Dentate Leaf Margin.

Figure 9. Crenate Leaf Margin.

Drupe Fruit Type: Usually a one-
seeded fleshy fruit from a single pistil with a fleshy outer wall and bony inner wall; hard coat around the seed, a part of the ovary; fleshy fruit. See Figure 13.


Figure 13. Drupe Fruit Type.

Exfoliating: Peeling off in thin layers.

Filament: Any thread-like body, used especially for that part of the stamen that supports the anther. See Figure 46.

## Funnelform Corolla

Type: Tube gradually expanding upward as a funnel, the limb may be flaring or somewhat at right angles to the flower axis. See Figure 17.

Figure 14. Elliptic Leaf Shape.

Entire Leaf Margin: Uncut, without indentations. See Figure 15.


Figure 15. Entire Leaf Margin.

## Even-pinnately

Compound: Same as odd-pinnately, except the leaf is terminated by a pair of leaflets. See Figure 16.


Figure 16. Even-pinnately Compound.

Herbaceous: A plant with no persistent woody stem above ground, also leaf-like in color or texture.
Head Flower Arrangement: An inflorescence consisting of a number of sessile flowers clustered on a common receptacle. See Figure 18.


Figure 18. Head Flower Arrangement.

Indehiscent: Remaining persistently closed, not opening by definite lines or pores.

Inflorescence: The flowering part of a plant.

Involucre: Accessory part of the fruit which may be cup-like and represents the fusion of abundant bracts as in oak, or bur-like as in the chestnut or capsular as in the beech.

Lanceolate: Shaped as the head of a lance, broadened at the base and tapering toward the apex. See Figure 19.

Leaflet: Each apparent blade of a compound leaf.

Lenticels: A group of raised, corky cells which form beneath the epidermis of a woody plant.

Linear: Long and narrow, the sides parallel or nearly so. See Figure 20.


Figure 19. Lanceolate.

Lobed Leaf Margin: Divided into lobes separated by narrow or acute sinuses which extend from one-third to one-half of the distance between margin and midrib. See Figure 21.

Midrib: The main or central vein of a leaf.


Figure 20. Linear.

Nut Fruit Type: Usually a one-celled, one seeded fruit with a bony, woody, leathery or papery wall, and usually partially or wholly encased in an involucre, or husk. See Figure 22.


Figure 22. Nut Fruit Type.

## Terms Beginning with 0-R

Oblanceolate Leaf Shape: The reverse of lanceolate, with the broadest half above the middle and tapering toward the apex. See Figure 23.

Oblong: Longer than broad, and with the sides nearly parallel. See Obovate.

Figure 24. Oblong.

Figure 25.
Figure 23. Oblanceolate Leaf Shape.



## Odd-pinnately

Compound: Leaflets
borne on a rachis; the leaf is terminated by a leaflet. See Figure 26.


Figure 26. Odd-pinnately Compound.


Figure 27. Opposite Leaf Arrangement.

Ovary: That part of the pistil that contains the ovules. See Figure 32.

Figure 24.


Figure 28. Orbicular Leaf Shape.

Oval Leaf Shape: Broadly elliptical, with the width usually greater than one half of the length. See Figure 29.
Obovate: Inversely ovate, with the broadest half above the middle. See Figure 25.

Orbicular Leaf Shape: Circular or nearly so. See Figure 28.


Opposite Leaf Arrangement: Two leaves at a node, one on the opposite side of the twig from the other; a condition called subopposite may occur in some plants when one leaf of a pair is slightly below or above the other. See Figure 27.

Figure 29. Oval Leaf Shape.

Ovate Leaf Shape: Egg-shaped, with the broadest half below the middle. See Figure 30.

Ovule: The structure that develops into the seed.


Figure 30. Ovate Leaf Shape.

Pistillate Flower: Provided with pistils, lacking stamens. See Figure 33.

Plumose: Hairs with side hairs along the main axis like the plume of a feather.

Pome Fruit Type: The product of a compound pistil; fleshy outer ovary wall and a papery or cartilaginous inner wall which encases numerous seeds; enlarged receptacle constitutes most of the fruit, fleshy fruit. See Figure 34.


Figure 34. Pome Fruit Type.

Pubescent: Covered with short, soft hairs.

Quilled: Circular, more or less tapering, usually hollow.

## Raceme Flower Arrangement: An

 inflorescence consisting of a central rachis bearing a number of pedicelled flowers; the pedicels of nearly equal length. See Figure 35.Rachis: Apparent continuation of the petiole in a compound leaf.


Figure 35.
Raceme
Flower Arrangement

Ray Florets: The strap-shaped flowers on the head of a chrysanthemum.

## Terms Beginning with S - W

Receptacle: The more or less expanded portion of the flower stalk that bears the organs of a flower or the collected flowers of a head.

## Revolute Leaf Margin:

Rolled backward, or underneath. See Figure 36.

Rhizome: Any prostrate, more or less elongated stem growing partially or completely beneath the surface of the ground.

## Rosette Leaf <br> Arrangement:

Arrangement of leaves radiating from a crown or center and usually grow close to the ground. See Figure 37.


Figure 36. Revolute Leaf Margin.


Figure 37. Rosette Leaf Arrangement.

Rotate Corolla Type: Wheelshaped, with a very short tube and a broad limb at right angles to it. See Figure 38.


Figure 38. Rotate Corolla Type.

Samara Fruit Type: Winged fruit; dry, indehiscent. See Figure 39.

Scalelike Leaf Shape: Small, short, usually sharp-pointed, broadened at the base. See Figure 40.

Sepal: One of the parts of the outer whorl of the floral envelope or calyx, usually green in color.


Figure 40.
Scalelike Leaf Shape.

Serrate Leaf Margin: Sharp teeth pointing toward the apex. See Figure 41.


Figure 41. Serrate Leaf Margin.

Simple Leaf: generally a leaf with one blade; without leaflets. See Figure 42.


Figure 42. Leaf.

Spadix: A spike with a thick and fleshy axis, usually densely flowered with imperfect flowers. See Figure 43.

Spathe: A large bract sheathing or enclosing an inflorescence. See Figure 43.


Figure $43 . \quad$ Spadix and Spathe.

Spatulate Leaf Shape: Shaped similar to a spatula or spoon; narrower and more tapered than obovate. See Figure 44.


Figure 44. Spatulate Leaf Shape.

Stamen: One of the pollen-bearing organs of a flower. Made up of filament and anther. See Figure 46.


Figure 46 . Stamen.

Staminate Flower: Bearing stamens only. See Figure 47.

Stigma: The part of the pistil that receives the pollen, usually at or near the apex of the pistil and mostly hairy or sticky. See Figure 32.


Figure 47. Staminate Flower.

Stipule: Leaflike appendage at the base of the leaf.

Stolon: Trailing shoot above ground, rooting at the nodes.

Style: The usually stalk-like part of a pistil connecting the ovary and stigma. See Figure 32.

Subulate: Awl-shaped; narrow and sharp pointed, gradually tapering from base to a slender or stiff point. See Figure 48.

Succulent: Fleshy and full of juice.


Figure 48. Subulate.

Tripinnate: Three times pinnate. See Figure 49.

Tuber: A thickened, short, usually subterranean stem having numerous buds called eyes.


Figure 49. Tripinnate.

Tunicate: Having enwrapping coats or layers.



Figure 50. Umbel Flower Arrangement.

Undulate Leaf Margin: Wavy (up and down in a vertical plane). See Figure 51.

Fgure 51.
Undulate Leaf Margin.

## Whorled Leaf

Arrangement: Three or more leaves at a node. See Figure 52.


Figure 52. Whorled Leaf Arrangement.

| Name |  | Contestant No. |  |
| :---: | :---: | :---: | :---: |
|  | Fruits and Nuts | Vegetables |  |
|  | a. Apple | a. Artichoke, globe |  |
|  | b. Apricot | b. Artichoke, Jerusalem |  |
|  | c. Avocado | c. Asparagus |  |
|  | d. Banana | d. Bean, snap |  |
|  | e. Barbados cherry | e. Bean, lima |  |
| 1. | f. Blackberry | f. Beet | 1. |
| 2. | g. Black walnut | g. Broccoli | 2. |
| 3. | h. Blueberry | h. Brussels sprouts | 3. |
| 4. | i. Carambola | i. Cabbage | 4. |
| 5. | j. Cashew | j. Carrot | 5. |
| 6. | k. Cherry | k. Cauliflower | 6. |
| 7. | I. Chestrut | I. Celery | 7. |
| 8. | m. Chinese jujube | m. Chard, Swiss | 8. |
| 9. | n. Coconut | n. Chayote | 9. |
| 10. | o. Elderberry | o. Cabbage, Chinese | 10. |
| 11. | p. Fig | p. Chives | 11. |
| 12. | q. Grape | q. Collards | 12. |
| 13. | r. Grapefruit | r. Cucumber | 13. |
| 14. | s. Guava | s. Eggplant | 14. |
| 15. | t. Hickory nut | t. Endive | 15. |
| 16. | u. Kumquat | u. Garlic | 16. |
| 17. | v. Lemon | v. Kale | 17. |
| 18. | w. Lime | w. Kohlrabi | 18. |
| 19. | x. Loquat | x. Leek | 19. |
| 20. | y. Lychee | y. Lettuce | 20. |
| 21. | z. Mamey sapote | z. Muskmelon | 21. |
| 22. | aa. Mango | aa. Mustard | 22. |
| 23. | bb. Mayhaw | bb. Okra | 23. |
| 24. | cc. Mulberry | cc. Onion | 24. |
| 25. | dd. Nectarine | dd. Parsley | 25. |
| 26. | ee. Orange | ee. Parsnip | 26. |
| 27. | ff. Papaya | ff. Pea, English | 27. |
| 28. | gg. Peach | gg. Pea, Southern | 28. |
| 29. | hh. Pear | hh. Pepper | 29. |
| 30. | ii. Pecan | ii. Potato, Irish | 30. |
| 31. | jj. Persimmon | ij. Potato, Sweet | 31. |
| 32. | kk. Pineapple | kk. Radish | 32. |
| 33. | II. Plum | II. Rutabaga | 33. |
| 34. | mm. Pomegranate | mm. Spinach | 34. |
| 35. | nn. Quince | nn. Squash, Butternut | 35. |
|  | oo. Raspberry | oo. Squash, Zucchini |  |
|  | pp. Strawberry | pp. Sweet Corn |  |
|  | qq. Sugar apple | qq. Tomato |  |
|  | rr. Tangelo | rr. Turnip |  |
|  | ss. Tangerine | ss. Watermelon |  |

Name $\qquad$ Contestant No.

Flowers and Foliage Plants
a. African violet
b. Aglaonema
c. Aloe Vera
d. Amaryllis
e. Begonia
f. Caladium
g. Canna
h. Celosia
i. Christmas cactus
j. Chrysanthemum
k. Coleus
I. Daylily
m. Dianthus
n. Dieffenbachia
o. Dracaena marginata
p. Episcia
q. Geranium
r. Gladiolus
s. Gloxinia
t. Grape ivy
u. Heart-leaf philodendron
v. Holly fern
w. Impatiens
x. Jade plant
y. Marigold
z. Neanthe bella palm
aa. Nephthytis
bb. Norfolk Island pine
cc. Pansy
dd. Peperomia
ee. Petunia
ff. Poinsettia
gg. Pothos
hh. Prayer plant
ii. Salvia
jj. Sandevieria
kk. Schefflera
II. Snapdragon
mm. Spathiphyllum
nn. Spider plant
oo. Swedish ivy
pp. Verbena
qq. Weeping fig
rr. Zebra plant
ss. Zinnia

## Ornamentals

a. Allamanda
b. American holly
c. Anise
d. Azalea
e. Black olive
f. Bougainvillea
g. Burford holly
h. Cabbage palm
i. Camellia
j. Canary Island date palm
k. Carissa (natal palm)
I. Chinese elm
m. Coontie
n. Crape myrtle
o. Croton
p. Dogwood
q. Feijoa
r. Glossy abelia
s. Hibiscus
t. Indian hawthorn
u. Ixora
v. Japanese privet
w. Liriope
x. Live oak
y. Loblolly bay
z. Mondo grass
aa. Nandina
bb. Pfitzer juniper
cc. Pindo palm
dd. Pine
ee. Photinia
ff. Pittosporum
gg. Podocarpus
hh. Pyracantha
ii. Red maple
jj. Royal poinciana
kk. Sago palm
II. Sea grape
mm. Silk oak
nn. Shumard oak
oo. Southern magnolia
pp. Sweet gum
qq. Sycamore
rr. Wax myrtle
ss. Wisteria

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Name $\qquad$
Contestant number $\qquad$
County $\qquad$

## FLORIDA 4-H HORTICULTURE IDENTIFICATION AND JUDGING CONTEST

JUDGING: Eight classes of horticultural plants or produce will be judged as follows:
A. Two classes of flowers and foliage plants.
B. Two classes of fruits and nuts.
C. Two classes of ornamentals.
D. Two classes of vegetables.

DIRECTIONS: There are 8 classes with 4 specimens in each class. The specimens are lettered A through D from left to right. When you have decided on the placing of a particular class, mark that placing opposite the appropriate class under the heading "Placing". Examples might be: CBDA, ADCB, BACD, etc. Be sure to judge all 8 classes.

| CLASS | PRODUCT | PLACING |  |
| :--- | :--- | :--- | :--- |
| CLASS 1 |  |  | SCORE |
| CLASS 2 |  |  |  |
| CLASS 3 |  |  |  |
| CLASS 4 |  |  |  |
| CLASS 5 |  |  |  |
| CLASS 6 |  |  |  |
| CLASS 7 |  |  |  |
| CLASS 8 |  |  |  |

Total Score $\qquad$ $\div 4=$ $\qquad$

