The Parts of a Flower

This lesson is from Virginia Tech and has not been edited by the Georgia Curriculum Office.
Parts of a Flower

- Sepal
- Petals
- Stamen
- Pistil
- Receptacle

*See Handout 1
Sepal

• Green, leaf-like structure
• Fold back when flower opens
• Collectively called the calyx
Petals

• Inside the sepals
• Leaf-like
• Colorful
• Attractant for pollinators
Stamen

- Male reproductive parts
- Consists of a filament & anther
- Produces pollen
- Pollen contains male sex cell
Pistil

- Female reproductive part
- 3 main parts
  - Stigma
  - Style
  - Ovary
Receptacle

• Swollen portion of the stem
• Flower parts are attached
Pollination

• Pollen transferred from anther to stigma
• Transfer take place via
  – Animals
  – Wind

*See Handout 2
Fertilization

• Pollen fuses with the egg
• Forms a new plant
• Self-pollination
• Cross-pollination
Cross-Pollination

• Used to develop new cultivars
• Occurs between closely related plants
Review

• Flowers have 5 main parts
  – Sepals, Petals, Stamen, Pistil, & Receptacle
• Stamen is the male part
• Pistil is the female part
• Fertilization is where the pollen fuses with the egg
• Cross-pollination occurs between two different plants
Top Rules for the Best Class

• Number 1
• Be Nice to Gretchen
Some Days She Is Stressed

Early Scottish torture techniques, No.17:
"Burning the Campbell at Both Ends."
Don’t Add To It
Top Rules for the Best Class

• Number 1
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Early Scottish torture techniques, No. 17: "Burning the Campbell at Both Ends."
Don’t Add To It
Tulip facts

• Origin: central Asia, Siberia, Mongolia, and China
• Breeding: 12th and 13th century in Persia
• 1500's: brought to Europe
• Conrad Gesner: printed the first illustration from an Australian garden in 1561 (gesneriana)
Tulip facts, cont.

• Plants are generally found in hilly country with extremely cold winters and hot dry summers.

• Bulbs are biocomputers and are never dormant. They continuously monitor their environment.

• Major marketing periods are Valentine's day and Easter.
Tulip facts, cont.

- 1000's cultivars over 400+ years
- Presently, 100's of cultivars
- Red is primary color
- Cultivars are available for forcing from mid-December to early May
Tulip Propagation

• Daughter bulb offsets from vegetative axillary buds in the axils of the tunicated scales
• Two to three new bulblets are produced annually
• It takes 2 to 3 years to produce a commercial size bulb capable of flowering
Flowering Control and Dormancy

- Bulb circumference or weight is the primary flowering control factor.
- Common bulb size for potted flowering plants is 4.75 - 5.5 inch (12 - 14 cm).
Fall
Bulbs planted, roots develop

Summer
Shoots senesce, daughter bulb complete, old bulb dissicates, harvest bulbs

Winter
Rooting, floral and leaf meristems present

Spring
Shoot elongation, flowering, daughter bulb growth
Flower Induction Requirements

• When bulbs are harvested, the apical meristem is vegetative.
• Flower initiation and subsequent development are controlled by post-harvest warm temperatures.
Flower Induction Requirements

• All forcers should check bulbs of all cultivars to be certain they have reached "G stage" prior to planting.
• If they have not, they should be held at 630F until they do.
Schedule and Timing
Growers must decide:

• Correct cultivar
• Desired flowering date
• Potted vs. cut
• Calculate backwards
  – Flowering to force to plant date
• Weeks of cold
• Which rooting room
• Pre-cooled vs. non pre-cooled
Cold storage

- This period is from planting until bulbs are placed in the greenhouse.
- The cold period varies from 15 to 23.5 weeks depending on cultivars and forcing date.
- Bulbs are potted at different times for different flowering dates (from Jan. 1 to May 8).
Cold storage

• Bulbs receive a cold treatment so that rapid plant development occurs when placed in the greenhouse.

• Two rooting rooms are used, A and B.

• The Holland Bulb Forcer’s Guide should be used to determine which bulbs are placed in each room.
<table>
<thead>
<tr>
<th>Temperature</th>
<th>Rooting room A</th>
<th>Rooting room B</th>
</tr>
</thead>
<tbody>
<tr>
<td>48°F</td>
<td>Plant until Nov. 5-10</td>
<td>Plant until Dec. 5-10</td>
</tr>
<tr>
<td>41°F</td>
<td>Nov. 5-10 until Jan. 1-5</td>
<td>Dec. 5-10 until Jan 1-5</td>
</tr>
<tr>
<td>32-35°F</td>
<td>Jan. 1-5 to finish</td>
<td>Jan. 1-5 to finish</td>
</tr>
</tbody>
</table>
Potted flowering tulip culture

• Light - 1000-2500 fc (low). Shade or light exclusion are sometimes used for etiolation to increase stem length on early crops
• Water - medium should always be kept evenly moist (in rooting room and greenhouse)
• CO2 is not used
• Nutrition - low requirement, but CaNO₃ can be used to prevent stem topple
• Media - do not overfill the pots
Tulip culture, cont.

• Arest drench within 24 hours of being moved to greenhouse
• Plant 6 - 7 bulbs in a 6-inch pot
• Space pot to pot in the cooler and greenhouse
Tulip Diseases

• Fusarium – white to tan mold growing on outer tunic of bulb
• soft bulbs
• light weight bulbs
Tulip Physiological Disorders

- Stem topple
  - Stem collapses a few centimeters below the base of the flower
  - Related to Ca deficiency
  - or excessive cooling
  - or high forcing temperatures
Scape Elongation

Cause is endogenous GA induced by cold treatment

2 basipetal nodes  Arest prevents during forcing

2 acropetal nodes

Cause is auxin, low light, and warm temperatures

No commercial means to prevent during postharvest
Narcissus

- *Pseudonarcissus*
  - trumpet
  - requires cold
  - one flower/scape
  - European
  - <150 commercial cultivars

- *Tazetta*
  - paperwhites
  - no cold
  - many flowers/scape
  - Mediterranean
  - < 10 commercial cultivars
Flowering Control and Dormancy

- Requires warm temperatures for floral initiation and differentiation which occur prior to harvest and continue afterward.
- Requires an absolute cold treatment for further floral differentiation, development and rapid emergence.
Daffodil Culture
(differences compared to tulips)

- Nutrition - no application needed during forcing
- Height control - Florel (ethephon) at 1000-2000 ppm
- Plant 3 standard bulbs in a 6-inch pot
- Bull-nosing is a physiological disorder where the flower fails to expand, is caused by high forcing temperatures.
Hyacinth uses

- Potted flowering plant
- Garden plants
- Bulbs to force in special vases
- Cut flowers
- Individual florets in corsages
- Perfumery
Hyacinth facts

• Origin is Mediterranean region, Asia and Europe
• 95% of bulbs are produced in The Netherlands
• 50 commercial cultivars
• Bulbs are scored and scooped to produce bulblets
Flowering Control and Dormancy

• The meristem is vegetative when the bulbs are harvested
• Flower formation requires warm temperatures
• Regular or prepared bulbs
Hyacinth culture
(differences compared to tulips)

- **Temperature**: take care to slowly increase temperature when going from cooler to greenhouse to prevent “spitting”
- **Nutrition**: CaNO$_3$ at 250 ppm
- **PGR**: Florel at 1000-2000 ppm
- **Planting**: one bulb/4-inch or 3 bulbs/6-inch
Hyacinth schedule and timing

• When bulbs arrive, store at 63°F until potting
• Only rooting room B is used
• December & January- forcing takes 21 days
• March & April- forcing takes 4-12 days
• Market when lower florets show color
• http://aggie-horticulture.tamu.edu/tisscult/microprop/microprop.html