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)
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 63°F 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 - 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

Temperature Sequences

<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 Ca(NO₃)₂ 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 auxin, low light, and warm temperatures

- 2 acropetal nodes
- No commercial means to prevent during postharvest

Arest prevents during forcing

Narcissus

- **Pseudonarcissus**
  - trumpet
  - requires cold
  - one flowerscape
  - European
  - <150 commercial cultivars

- **Tazetta**
  - paperwhites
  - no cold
  - many flowerscape
  - 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 - CaNO₃, 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