

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.

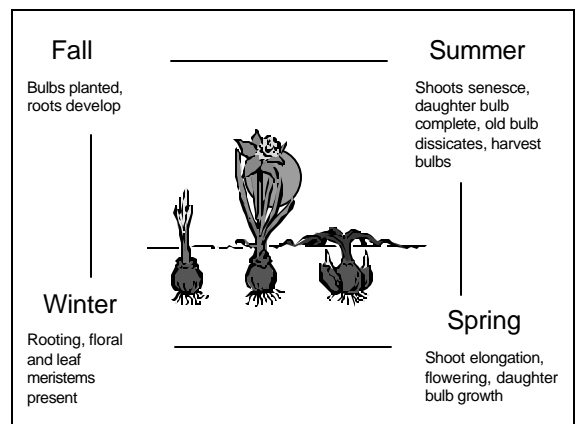
- 1000's cultivars over 400+ years
- Presently, 100's of cultivars
- Red is primary color
- Cultivars are available for forcing from mid-December to early May

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

Temperature	Rooting room A	Rooting room B
48 °F	Plant until Nov. 5-10	Plant until Dec. 5-10
41 °F	Nov. 5-10 until Jan. 1-5	Dec. 5-10 until Jan 1-5
32-35 °F	Jan. 1-5 to finish	Jan. 1-5 to finish

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

Cause is auxin, low light, and warm temperatures

2 acropetal nodes

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