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### WHAT TO DO WHEN YOUR BULBS ARRIVE

Bulbs should be planted soon after arrival. If you cannot plant right away, you can store bulbs for up to a month by following these steps. Open all bags and boxes and place bulbs in a cool, dark, dry area with good air circulation (e.g., root cellar, basement, or garage). You can also store your bulbs in the refrigerator crisper drawer, but do not store them with ripening fruits; ethylene gas released by ripening apples and other fruits can cause the flower inside the bulb to abort or incompletely form. Temperatures of 38–65°F (3–18°C) are fine. The cooler the better, but do not freeze your bulbs.

**Inspecting your bulbs:** The exterior of the bulbs may have a small amount of blue mold (*Penicillium*) present. This is typical and rarely a concern to the health of the bulb or your soil. Bulbs may have small scuffs or scars from the harvest process, and the outer skin of the bulb may not be fully intact. This is also common and will not affect the productivity of the bulbs.

**Note in Hardiness Zones 8–10:** Johnny's does not currently offer prechilled bulbs. You will need to prechill your bulbs at 38–45°F (3–7°C) before planting.

- Tulips in Zones 8–10 require 6–12 weeks of prechilling, depending on variety.
- Narcissus in Zones 9–10 require about 16 weeks of prechilling.

To prechill, leave bulbs in their bags and place in a refrigerator. Bulbs can be refrigerated for longer than the recommended period but not for a shorter period. Be careful not to store bulbs near fruit, especially apples. Once bulbs have been chilled, plant them immediately, at the coolest time of the year.

### SITE SELECTION & PREPARATION

Bulbs require a well-drained soil with a pH 6.0–7.0. Amend the soil as necessary to adjust the pH and optimize drainage. Avoid excessive nitrogen and fresh manure. Plants thrive in full sun but will tolerate part shade, requiring at least 5–6 hours of sun per day at the time of bloom.

### PLANTING

Plant bulbs when the soil has cooled to 55°F (13°C) or lower, and nighttime temperatures consistently drop to 40–50°F (4–10°C), but before the ground freezes. Planting about 5–6 weeks before the ground freezes allows the bulbs sufficient time to develop roots.

Loosen the soil to a depth of 8–12" to help ensure adequate root establishment. Adding a layer of compost to the root zone at planting will also aid in root establishment and plant growth. Press bulbs, upright, into the prepared soil (with the pointed end up and the fatter, flat end down). Cover bulbs with soil, 2½–3 times deeper than the bulb height, or deeper in locations with light soil. For example; a 1½" tall bulb should be covered with 4–5" of soil. As a rule of thumb, planting a little too deep is better than planting too shallow. Planting each bulb at the same depth will help ensure that they all bloom at the same time.

### Bulb Spacing

- **Tulips for annual cut flower production:** Space bulbs ¼–½" apart, like eggs in an egg carton (as close together as possible without allowing the bulbs to touch each other).
- **Tulips and daffodils in landscape beds or garden beds:** Space bulbs 1–6" apart.

Note for daffodils: Wider spacing allows room for bulbs to multiply. Do not break apart bulb clumps that have smaller bulbs attached at the base. Plant them as an intact cluster.

### MULCH

While not required, mulching with chopped straw, chopped leaves, or pine bark 2–4" deep can be helpful for preserving moisture, cooling the soil, and deterring weeds. Wait to apply mulch until after the ground has frozen; damage to bulbs can occur if the mulch is applied when the soil temperatures are too high. Remove mulch in early spring. Leaving mulch in place will delay flowering.

## IRRIGATION

Daffodils and tulips have different water requirements.

- **Tulips:** Water immediately after fall planting. Thereafter, normal rainfall should suffice in all but the driest climates.
- **Daffodils:** Water immediately after planting. Continue to water regularly until the ground freezes. Keep the soil moist but not soggy. The following year, water regularly even after plants have stopped blooming; plants need water to form the bulbs that will create next year's flowers.

## FERTILIZER

First-year planted bulbs and bulbs treated as annuals do not need fertilizer for flowering. Perennialized bulbs can benefit from the addition of compost or a slow-release bulb food on top of the soil from their second year on. Top-dress with fertilizer three times per year: in the fall, in spring prior to bud formation, and once in early summer, after blooms have faded. Avoid harsh fertilizers and high-nitrogen fertilizers.

## HARVEST

- **Daffodils:** To get a long stem and reduce the amount of sap released, harvest by reaching to the base of the stem and pulling up gently. The sap of daffodils can be toxic to other types of flowers. If you plan to use them in a mixed arrangement, allow the daffodils to sit in their own water for 12–24 hours before combining them with other flowers.
- **Tulips:** Harvest when the flowers start to show color but before they begin to open. For optimal stem length, harvest by reaching to the base of the stem and pulling up gently. This method will add 3–6" of stem length, compared to cutting the stems at the soil line. For longer-term storage of tulip flowers, harvest with the bulb on the stem by lifting the bulbs with a garden fork and pulling up. Harvesting with the bulb attached provides a food source for the tulip during long-term storage. Stand tulips upright or wrap in paper to keep stems straight during storage. Note that tulips "walk" in the vase; the stem continues to elongate in the vase and bend toward the light, causing the flower to move over time.

## STORAGE

The optimal cut-flower storage temperature is 32–35°F (0–2°C).

## GARDEN MAINTENANCE AND PERENNIALIZATION / NATURALIZATION

Deadhead any blooms that you do not harvest; this encourages the plant to send energy to the bulb. We also recommend leaving the photosynthesizing foliage intact if you wish to encourage repeat blossoming the following year. Mow over only after the leaves have yellowed completely, taking care not to dislodge bulbs. Keep the bed weeded.

- **Daffodils:** Well-maintained daffodil bulbs should remain productive year after year. Daffodil bulbs multiply; in time one bulb will become a clump of bulbs. Divide the clumps of bulbs every 4–5 years. Dig the bulbs up in August and replant immediately.
- **Tulips:** With some exceptions, most of the hybrid tulips do not naturalize for dependable blooms year after year. Therefore, many cut-flower growers treat tulips as annuals. Refer to individual product descriptions for more information on which varieties will naturalize.

## PESTS AND DISEASES

Botrytis blight (*Botrytis tulipae*; also known as tulip fire) is a fungal disease that causes soft brown spots on leaves, stems, and flowers. It can progress rapidly and kill large numbers of plants. Reduce the risk of *Botrytis* blight by planting in well-drained soil and avoiding overcrowding plants. Avoid excess nitrogen, which can weaken plants, and clean crop debris from the field/garden each year. Destroy infected plants and rotate out of infected soil for at least 2 years.

Aphids can attack plants and spread virus. Control with a horticultural soap, or, if growing in a greenhouse, use of the parasitoid wasp, *Aphidius* is also an option.