

## CUCUMBERS (*Cucumis sativus*)

Producing cucumbers in a protective structure, such as a greenhouse or high tunnel, offers a much improved environment for growth. This improved environment allows for higher marketable yields especially with thin-skinned varieties, extended harvest periods, and reduced pest pressure.

Trellising and pruning, along with an uninterrupted supply of water and nutrients are necessary to produce the quality fruits demanded in today's marketplace.

### VARIETY SELECTION:

Varieties must have certain characteristics in order to be successful in a greenhouse setting. Please refer to our technical sheet Cucumber Types and Terminology for additional information for selecting cucumbers based on type.

- **Parthenocarpic:** If you do not intend to provide some sort of pollinator, like honey bees, it is necessary to use parthenocarpic varieties. Many greenhouses exclude pollinators and other insects to prevent cross-pollination of seeded and seedless varieties.
- **Gynoecious:** Gynoecious varieties bear almost all female flowers, and so produce the highest number of fruits — this trait aids in receiving a higher return-on-investment for using tunnel space.
- **Disease Resistance:** A strong disease-resistance package keeps a plant producing for a long season. Of the number of diseases that can present themselves, powdery mildew is one of the most common in greenhouse cucumbers.

### CULTURE:

Cucumbers require a warm, well-drained soil with a pH of 6.8–7.2. High fertility levels along with sufficient and consistent irrigation will keep the plant producing over a long season — 12–16 weeks of harvest is not uncommon. As cucumbers are sensitive to the cold, laying plastic mulch in advance to planting will warm the soil and suppress weeds.

After germination, keep temperatures at 73–76°F/22–24°C during the day, and a minimum of 70°F/21°C at night.

Plants are ready to transplant 3–4 weeks after sowing, when they have 2–4 true leaves. Place seedlings in greenhouse soil or grow bags, spaced 18–24 inches apart in rows 4–5 feet apart. Make sure to only transplant when soil or ambient greenhouse temperatures rise to 60–65°F/16–18°C.

### TRANSPLANTING:

Three to four weeks before your intended transplant date, sow 1–2 seeds per cell in 50-cell plug trays, ½ inches deep. Maintain temperatures at 80–85°F/27–29°C until seedlings emerge — using a heat mat can aid in maintaining consistent temperatures.

**TRELLISING:**

In order to grow straight fruits, pruning and trellising the plants is a necessity. Not only does this allow for quality fruit production, it also uses the limited space of a covered growing structure in a more efficient manner. Proper trellising also helps provide adequate air flow to prevent disease issues.

Many types of trellis systems may be employed. A simple option is providing a mesh trellis for the vines to climb — this is the preferred method if you are growing field varieties in a tunnel, which you wouldn't necessarily prune.

For varieties bred for greenhouse production, it is best to prune the vines to a single leader, much like you would for indeterminate tomatoes. This method requires a strong wire suspended 6–8 feet above the greenhouse floor. The wires may be supported by the roof trusses and attached to the end walls running the length of the greenhouse. Roof purlins may also be used to hang the trellis strings. Individual strings should be hung from the wire for each cucumber plant. The strings are then tied or attached with tomato clips to the base of each stem just above the soil surface, or secured with a single overhand knot. As the plants grow, either attach more clips or wrap the stems around the string. Always wrap the string in the same direction to avoid unraveling and the plants falling down. Also be aware of any developing fruit to avoid wrapping the string over them.

**PRUNING:**

One of the most common methods for pruning greenhouse cucumbers is known as the "umbrella system." As the plant grows up the string, remove all the lateral buds up to the top wire. Pruning the lateral buds allows the plant to direct its energy to producing fruit rather than an abundance of foliage. Once the vine has reached the top wire the terminal leader is removed. Let 2–3 secondary or lateral buds grow from the top of the plant. Follow the same method of removing lateral buds as the plant continues to grow downward.

In addition to the lateral buds, all the fruits should also be removed up to the 6th node, where a leaf joins the stem — this will be approximately the first 3½-foot section of the main vine. After this point, if the large-fruited varieties, such as slicing, long European, and Beit Alpha types, set more than one fruit per node, these may be pruned back to one fruit; the large-fruited types may not support more than one fruit per node. All of the fruits on the smaller types, such as snackers, cocktail, and pickling varieties, can be left intact.

Fruit drop may occur if the plants are stressed from either lack of water or fertility.

**DISEASES:**

Prevent the occurrence of disease by practicing crop rotation, managing pests that spread disease, removing debris, controlling humidity and choosing disease-resistant varieties. The best defense against disease is varieties with genetic resistance. Viruses that cause disease are very regional, so it is best to select varieties that are common in your area.

Powdery mildew presents itself on the leaves as irregularly shaped, white, powdery spots. This symptom can progress to the point of the leaves turning yellow and dying. The best method of prevention is to select disease-resistant varieties, but powdery mildew thrives in the humidity of a high tunnel, so ensure your structure is well ventilated. Mildew Cure<sup>®</sup>, MilStop<sup>®</sup>, and OxiDate<sup>®</sup> may provide some measure of control.

**PESTS:**

Within the greenhouse or high tunnel, biological controls, such as predatory mites, are an effective option for spider mites and thrips, especially if released before pest issues arise. For squash bugs and cucumber beetles, PyGanic<sup>®</sup> and Safer<sup>®</sup> Insect Soap may be effective controls. Cucumber beetles can act as a vector for bacterial wilt. The use of yellow sticky traps may provide some control against cucumber beetles.

**HARVEST AND STORAGE:**

Pick fruits daily once the plant begins bearing. Keep cucumbers for up to 2 weeks by refrigerating at 45–50°F/7–10°C and 90% relative humidity