

## Meeting the Postharvest Needs of Vegetables from Field to Market

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Harvested vegetables are living systems that age with time. As a grower, your goal is to slow down the aging process. To do that, you need to understand, and manage, four natural processes: respiration, transpiration, ethylene production, and chilling injury. Proper cooling is the first step, followed by maintaining the optimum temperature and relative humidity (RH) for each vegetable.

**Produce a Clean, Mature Product:** Quality cannot be improved after harvest; it can only be maintained. So it makes sense to start with the highest quality crop possible at harvest. This means selecting the right varieties, controlling pests during the growing season, managing water and nutrients, and harvesting at the optimal time.

**Handle with Tender Loving Care:** If produce is injured during harvest, grading or packaging, damage may not be seen until it reaches the retail or consumer levels. Postharvest rots are more prevalent in injured produce. Mechanically damaged fruits and vegetables also lose water more rapidly. Whether you are harvesting and handling cabbages or corn, berries or beans, “treat ‘em like eggs!”

**Remove the Field Heat:** Postharvest cooling lowers the respiration rate of the product, slows water loss, inhibits the growth of molds and bacteria that can cause decay, and reduces the production of the ripening agent ethylene. Cooling methods include room-cooling, forced-air cooling, hydro-cooling and icing.

**Sanitize for Food Safety:** Using chlorine or other sanitizing agents in wash water and hydro-cooling water helps protect against post-harvest diseases and also helps protect consumers from food-borne illnesses caused by pathogens.

**Package Properly:** Any packaging should be designed to prevent physical damage to produce and be easy to handle. Packaging can aid in retaining water while still allowing gas exchange.

**Know Your Vegetables:** Become familiar with the optimum storage temperatures and curing needs of each produce item. Below are specific recommendations for a few important fresh and storage crops grown in New England.

### Broccoli:

- Optimum temperature: 32°F reached ASAP after harvest
- 95% RH
- Very high respiration and transpiration rates
- Low ethylene production; extremely sensitive to exposure

**Summer Squash:**

- Maturity indicated by a variety of characteristics and market demand
- Optimum temperature: 41-50°F
- 95% RH
- Transpiration rates high; water loss shrivels fruit
- Very chilling sensitive when held below 40°F
- Low rates of ethylene production; low to moderately sensitive to ethylene exposure

**Winter Squash:**

- Maturity indicated by rind hardness, color, and corking of the stem
- Curing helps harden rinds, but not recommended for acorns (10 days, 80-85°F and 80-85% RH)
- Optimum temperature: 55-59°F for most, but 50-55°F for green rind types
- 50-70% RH
- Very chilling sensitive when held below 50°F
- Most store 2-3 months, less for acorns, more for hubbards

**Onions:**

- Maturity indicated when 10-20% tops down in the field
- Undercutting 1-2 inches accelerates dormancy
- Curing in field when temperatures are over 75°F
- Forced air curing can be rapid (12 hours at 86-105°F) or slower
- Mature for storage when neck scale are completely dry; loss of 5-8%
- Optimum temperature: 32°F but not below
- 75-80% RH for best scale color
- Can store up to 6-9 months; typically 3-6 months
- Exposure to ethylene encourages sprouting

**Carrots**

- Maturity indicated by a variety of characteristics and market demand
- More mature carrots will store longer than less mature ones
- Optimum temperature: 32°F but not below
- 98-100% RH but avoid free water which speeds decay
- Can store 3-5 months under good conditions
- Low ethylene production; exposure to ethylene results in bitter flavor

**Potato**

- Maturity indicated when tuber skins are set, vines are dry
- Optimal harvesting temperatures are 45-60°F
- Prevent bruising and injury; treat gently
- Cull and cure before storage. Cure by holding at 50-60°F and 95% RH for 10-14 days.
- Optimum temperature: 38-40°F for tablestock
- 95% RH
- Can store up to 6-9 months; typically 3-6 months
- Exposure to ethylene encourages sprouting