Table 4 .... Storage Conditions for Cut Flowers and Nursery Stock[a]

Commodity	Storage Temperature, F	Relative Humidity, %	Approximate Storage Life	Method of Holding	Highest Freezing Point, F
Cut Flowers:					
Calla lily	40	80–85	1 week	Dry pack	—
Camellia	45	80–85	3–6 days	Dry pack	30.6
Carnation	31	80–85	1 month	Dry pack	30.8
Chrysanthemum	31	80–85	2–5 weeks	Dry pack	30.5
Daffodil	31	80–85	1–2 weeks	Dry pack	—
Gardenia	31	80–85	2–3 weeks	Dry pack	31.0
Gladiolus	35	80–85	1 week	Dry pack	31.4
Iris, tight buds	31	80–85	2 weeks	Dry pack	30.6
Lily, Easter	31	80–85	2 weeks	Dry pack	31.1
Lily-of-the-Valley	31	80–85	2–3 weeks	Dry pack	—
Orchid	45–55	80–85	2–3 days	Water	31.4
Peony, tight buds	31	80–85	6 weeks	Dry pack	30.1
Rose, tight buds	31	80–85	2 weeks	Dry pack	31.2
Sweet peas	31	80–85	2 weeks	Dry pack	30.4
Tulips	31	80–85	6–8 weeks	Dry pack	—
Greens:					
Fern, dagger and wood	31	85–90	4–5 months	Dry pack	28.9
Holly	31	85–90	1–4 weeks	Dry pack	27.0
Huckleberry	31	85–90	1–4 weeks	Dry pack	26.7
Laurel	31	85–90	1–4 weeks	Dry pack	27.6
Magnolia	31	85–90	1–4 weeks	Dry pack	27.0
Rhododendron	31	85–90	1–4 weeks	Dry pack	27.6
Salal	31	85–90	1–4 weeks	Dry pack	26.8
Bulbs:					
Amaryllis	70–75	75–80	5 months	Dry	30.8
Dahlia	40–45	75–80	5 months	Dry	28.7
Gladiolus	40–45	75–80	8 months	Dry	28.2
Iris, Dutch, Spanish	75–80	75–80	4 months	Dry	—
Lily					
Candidum	31	75–80	3 month	Poly liner & peat	—
Croft	31	75–80	2 months	Poly liner & peat	—
Longiflorum	31	75–80	3 months	Poly liner & peat	28.9
Speciosum	31	75–80	3 months	Poly liner & peat	—
Peony	40–45	75–80	5 months	Dry	—
Tuberose	40–45	75–80	4 months	Dry	—
Tulip	40–45	75–80	1–2 months	Dry	27.6
Nursery Stock:					
Trees and Shrubs	32–35	80–85	4–5 months	[b]	—
Rose Bushes	32–35	85–95	4–5 months	Bare rooted with poly liner	—
Strawberry Plants	30–32	80–85	4–10 months	Bare rooted with poly liner	29.9
Rooted Cuttings	33–40	85–95	—	Poly wrap	—
Herbaceous Perennials	27–28 or 33–35[b]	80–85	—	[b]	—

[a] Data from *USDA Handbook* No. 66 and bulletin by Port and Fischer.
[b] For details for various trees, shrubs, and perennials, see bulletin by Mahlstede and Fletcher.

of strawberry plants, bare-root rose bushes, and certain cuttings and other nursery stock in storage. Strawberry plants can be stored up to 10 months in polyethylene-lined crates at 30 to 32 F.

Nuts—See Chapter 50

Onions

A comparatively low relative humidity is essential in the successful storage of onions. At higher humidities in which most other vegetables keep best, onions are disposed to root growth and decay and at too high a temperature sprouting is encouraged. Therefore storage at 32 F with a relative humidity of 70 to 75 percent is recommended to keep them dormant. Onions in cold storage are usually held in 50-lb mesh sacks which are best piled in pairs laid crosswise of each other in stacks 5 or 6 sacks high. The stacks are set on dunnage strips to allow air passage beneath and spaced a few inches apart to allow further air circulation. *Onion sets* require practically the same temperature and humidity conditions as onions, but since they are smaller in size they tend to pack more solidly. They are handled in approximately 25-lb bags and should be stacked to allow the maximum of air circulation.

Oranges—See Chapter 48

Peaches

Peaches can be stored for only short periods. However, if well matured but not overripe, they can be held at 31 to 32 F for 2 to 4 weeks. Deterioration is marked by loss of flavor and bright natural color and by browning of the flesh, especially around the pit. This deterioration occurs much more rapidly at 36 to 40 F than at 31 or 32 F.

Pears—See Chapter 47

Peppers

Sweet peppers can be stored a maximum of 8 to 10 days at 45 to 50 F. They are subject to chilling injury if stored at temperatures below 45 F. The symptoms of this injury are surface pitting and discoloration near the calyx, which develops in a few hours after removal from storage. When stored at temperatures above 50 F, ripening (red color) and decay development are rapid.

Chili peppers after drying to a moisture content of 10 to 15 percent are stored in nonrefrigerated warehouses for as long as 6 to 9 months. The moisture content is usually low enough to prevent mold growth. Polyethylene lined bags are recommended to prevent changes in moisture content. Manufacturers of chili pepper products hold part of their supply of the raw material in cold storage at 32 to 35 F, but they prefer to grind the peppers as soon as possible and store them in the manufactured form in airtight containers.

Popcorn

Popcorn should be stored at 32 to 40 F and at a relative humidity of about 85 percent. For optimum popping condition a moisture content of about 13.5 percent is desirable. The above relative humidity should maintain about this amount of moisture.

Plums and Fresh Prunes

Plums and fresh prunes are not stored extensively and are not adapted to long storage. *Abundance, Wild Goose,* and varieties of the *Damson* type store better than the softer-fleshed plums of the oriental varieties. Of the latter, well-matured *Santa Rosa, Eldorado, Nubiana* and *Kelsey* plums can usually be stored satisfactorily for 1 month at 32 F. Ripening occurs very slowly at this temperature but there is gradual loss of varietal flavor. Storage beyond 1 month often results in flesh browning and abnormal flavors. *Italian prunes,* if held longer than about 3 weeks, are likely to develop internal breakdown as well as abnormal odor and flavor. Too much confidence should not be placed on the appearance and condition of the fruit while it is in storage, as more deterioration, decay, shriveling, and internal browning may take place within 3 days after removal from storage than during the whole storage period.

Potatoes

Early crop potatoes are usually not stored except during congested periods. They are more perishable and cannot be expected to keep as well or as long as late crop tubers. Refrigerated storage at 50 F following a curing period of a few days at 70 F is recommended. If early crop potatoes are to be used for chipping or french frying, storage at 70 F is recommended.

Late crop potatoes should keep in sound dormant condition at 40 F for 5 to 8 months. A temperature below this is not desirable except for seed stock for late planting. For this purpose 38 F is best. At 40 F or below Irish potatoes tend to become sweet. For ordinary table use potatoes from 40 F are satisfactory but they probably will be unsatisfactory for chipping or french frying without being desugared or conditioned at about 70 F for 1 to 3 weeks previous to use. Potatoes will remain dormant at 50 F for from 2 to 4 months, and since tubers from this temperature are more desirable for both table use and processing than those from 40 F it is recommended that late crop potatoes for use within 4 months be stored at 50 F and those for later use at 40 F. All potatoes should be stored in the dark. They should not be kept in the same room with fruits, nuts, eggs or dairy products because of the objectionable flavor they may impart.

Poultry

Frozen poultry should be stored at 0 to −20 F with the temperature maintained as constant as possible. Ready-to-cook chickens packed in institutional packs with good quality liners should remain in satisfactory condition for 9 to 10 months, and similar birds individually wrapped in film should hold up in storage for 12 to 18 months. Improper handling during any of the processing operations could materially reduce these safe storage times.

When frozen poultry is held under severely fluctuating temperatures, evaporation of moisture from the skin may be so great that it causes light-colored pockmarks to appear. Such a condition is called freezer burn, the outstanding visual defect of frozen poultry. Although freezer burn may not affect the flavor of the meat, it reduces the sales value of the processed poultry by several cents per pound and may toughen slightly the skin and meat directly underneath. Freezer burn can be lessened by packaging the birds properly and by maintaining proper storage conditions. For detailed information consult Chapters 32 and 42.

Pumpkins and Squashes

Hard-shell squashes, such as the Hubbards, can be successfully stored for 6 months or longer at 50 to 55 F with a relative humidity of 70 to 75 percent. Dry storage is needed for quality retention. All specimens should be well matured, carefully handled, and free from injury or decay when stored. Most varieties of pumpkins do not keep in storage as long as the usual storage varieties of squash. Such varieties as *Connecticut Field* and *Cushaw* are poor keepers and cannot be kept in good condition more than 2 to 3 months. *Acorn* squashes cannot be stored satisfactorily for more than 2 months.

Summer squashes, such as straightneck, keep best at a temperature of 32 to 40 F and a relative humidity of 85 to 90 percent. Under these conditions, they may show an increase in yellow color, extent of pitting, and wilting at the necks after 2 weeks, but should show little decay.

Tomatoes

Firm, fully ripe tomatoes can be kept a week at 32 F, but unripened tomatoes can best be kept at no lower than 55 F. They will ripen slowly at this temperature and remain in good salable condition for 2 to 5 weeks. For rapid ripening, 70 F is the optimum, but temperatures of 60 to 65 F are most used by the industry because, although the tomatoes ripen more slowly, they are firmer and usually have less decay than those ripened at 70 F or above. The relative humidity of storage or ripening rooms should be 88–90 percent. Storage temperatures below those given cause the unripened fruits to become weakened through chilling injury and therefore more subject to decay. *Mature green* tomatoes may be held at 40 F for 3 days with little or no injury. When held longer, they may ripen with satisfactory color but will show an increase in decay in proportion to the length of exposure.

Vegetable Seed

Seeds require a relatively low temperature and humidity. Storage at 32 F is most desirable but 50 F is satisfactory if a 50 percent rh can be obtained. High temperature and high