

Annual Culinary Herbs

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Wright is with Dole Fresh Vegetables, Salinas, CA.

Scientific Names and Introduction

Culinary herbs include basil (*Ocimum basilicum* L.), chervil, salad chervil (*Anthriscus cerefolium* L. [Hoffm.]), coriander, cilantro, Chinese parsley (*Coriandrum sativum* L.), dill (*Anethum graveolens* L.), and savory/summer savory (*Satureja montana* L.). Leaves of annual herbs are typically used, though roots of coriander are also. Herbs are grown in both the field and greenhouse.

Quality Characteristics and Criteria

Herbs should appear fresh and green: no yellowing, decay, insect, or mechanical damage. Leaves should be uniform in size. Flavor and aroma should be strong and characteristic of the herb. There are purple forms of basil that should have a rich color.

Horticultural Maturity Indices

Annual herbs should be harvested before flowering. Basil still maintains its quality with some flowers.

Grades, Sizes, and Packaging

There are no market grades or sizes for fresh herbs. They may be tied or bunched with a rubberband, packaged in plastic bags or clamshells, then packed in corrugated cartons. Perforated polyethylene liners will prevent dehydration and maintain quality.

Precooling Conditions

With the exception of basil, herbs should be cooled to just above 0 °C (32 °F) as soon as possible after harvest. Vacuum cooling is recommended (Aharoni et al. 1988). Basil should be cooled to no lower than 12 °C (54 °F).

Optimum Storage Conditions

Chervil, coriander, dill, and savory should be stored at 0 °C (32 °F) and 95 to 100% RH. Postharvest life ranges from 1 week for chervil (Gorini 1981) to 2 weeks for coriander and dill and up to 3 weeks for savory. Basil should be stored at 12 °C (54 °F) and 95 to 100% RH (Aharoni et al. 1993). At this temperature and RH, quality can be maintained for 2 weeks (Lange and Cameron 1994).

Controlled Atmosphere (CA) Considerations

A 5 to 10% O₂ + 4 to 6% CO₂ CA is only moderately beneficial for fresh herbs (Saltveit 1997).

However, MAP lengthens the shelf-life of coriander (Loiza and Cantwell 1997), chervil (Aharoni et al. 1993), and basil (Lange and Cameron 1998).

Retail Outlet Display Considerations

Use of water sprinklers is acceptable. Basil should not be displayed at temperatures below 12 °C (54 °F) because of chilling sensitivity. Other herbs should be displayed at 0 °C (32 °F) in refrigerated units.

Chilling Sensitivity

Chervil, coriander, dill, and savory are not sensitive to chilling and should be stored as cold as possible (0 °C [32 °F]) without freezing. Basil is susceptible to chilling injury if stored below 12 °C (54 °F). The primary symptom of chilling injury is browning or blackening of the leaves (Cantwell and Reid 1993).

Ethylene Production and Sensitivity

Annual herbs produce very little ethylene, but are highly susceptible to ethylene exposure (Cantwell 1997). Symptoms of ethylene damage include yellowing and leaf abscission (Cantwell and Reid 1993).

Respiration Rates

Temperature	Basil	Chervil	Coriander	Dill
	-----mg CO ₂ kg ⁻¹ h ⁻¹ -----			
0 °C	36	12	22	22
5 °C	—	—	30	—
7.5 °C	—	—	46	—
10 °C	71	80	—	103
20 °C	176	170	—	324

Data from Cantwell and Reid (1993) and Loiza and Cantwell (1997).

To get mL CO₂ kg⁻¹ h⁻¹, divide the mg kg⁻¹ h⁻¹ rate by 2.0 at 0 °C (32 °F), 1.9 at 10 °C (50 °F), and 1.8 at 20 °C (68 °F). To calculate heat production, multiply mg kg⁻¹ h⁻¹ by 220 to get BTU per ton per day or by 61 to get kcal per tonne per day.

Physiological Disorders

Yellowing and leaf abscission may occur due to ethylene exposure, especially if herbs are held at 10 °C (50 °F) or warmer. Basil is susceptible to chilling injury if held below 12 °C (54 °F), the main symptom being necrosis and browning or blackening of the leaves.

Postharvest Pathology

Molds and bacterial decay may develop, especially on mechanically damaged leaves or cut ends

of stems. Low temperatures should be maintained throughout the cold chain to minimize pathological disorders and prolong shelf-life. Chilling increases the susceptibility of basil to decay.

Quarantine Issues

There are no quarantine issues.

Suitability as Fresh-Cut Product

Annual herbs are used in some packaged salad blends.

Special Considerations

High RH is used to prevent water loss and is especially important in maintaining the quality of fresh herbs.

References

- Aharoni, N., O. Dvir, D. Chalupowisz, and Z. Aharon. 1993. Coping with postharvest physiology of fresh culinary herbs. *Acta Hort.* 344:69-78.
- Aharoni, N., A. Reuveni, and O. Dvir. 1989. Modified atmospheres in film packages delay senescence and decay of fresh herbs. *Acta Hort.* 258:255-262.
- Cantwell, M. 1997. Properties and recommended conditions for storage of fresh fruits and vegetables. At <http://postharvest.ucdavis.edu>.
- Cantwell, M.I., and M.S. Reid. 1993. Postharvest physiology and handling of fresh culinary herbs. *J. Herbs, Spices, Medicinal Plants* 1:83-127.
- Gorini, F. 1981. Vegetable schedules. 2. Leafy vegetables. Chervil. *Informatore di Ortoflorofrutticoltura* 22:3-4.
- Lange, D.D., and A.C. Cameron. 1994. Postharvest shelf-life of sweet basil (*Ocimum basilicum*). *HortScience* 29:102-103.
- Lange, D.D., and A.C. Cameron. 1998. Controlled atmosphere storage of sweet basil. *HortScience* 33:741-743.
- Loaiza, J., and M. Cantwell. 1997. Postharvest physiology and quality of cilantro (*Coriandrum sativum* L.). *HortScience* 32:104-107.
- Saltveit, M.E. 1997. A summary of CA and MA requirements and recommendations for harvested vegetables. *In* M.E. Saltveit, ed., 7th International Controlled Atmosphere Research Conference, vol. 4, Vegetables and Ornamentals, pp. 98-117. *Postharvest Hort. Ser. no. 18*,

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