Recommendations for Maintaining Postharvest Quality

Carlos H. Crisosto, Elizabeth J. Mitcham and Adel A. Kader
Department of Plant Sciences, University of California, Davis

Maturity Indices

In California, harvest date is determined by skin ground color changes from green to yellow. The exact yellowish-green color depends on the cultivar. Apricots should be picked when still firm because of their high bruising susceptibility when soft. Most apricot cultivars soften very fast making them very susceptible to bruising and subsequent decay.

Quality Indices

Fruit size, shape, and freedom from defects and decay. High consumer acceptance is attained for fruit with high (>10%) soluble solids content (SSC) and moderate acidity (0.7-1.0%). Apricots with 2-3 pounds-force flesh firmness are considered "ready to eat". Apricot cultivars have a rapid rate of fruit softening (3 pounds-force per day at 20°C (68°F).

Optimum Temperature

-0.5 to 0°C (31-32°F) is recommended. Susceptibility of cultivars to freezing injury depends on SSC, which may vary from 10-14%. Highest freezing point = -1.0°C (30.5°F).

RATES OF RESPIRATION

<table>
<thead>
<tr>
<th>Temperature</th>
<th>0°C (32°F)</th>
<th>10°C (50°F)</th>
<th>20°C (68°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ml CO₂/kg·hr</td>
<td>2-4</td>
<td>6-10</td>
<td>15-25</td>
</tr>
</tbody>
</table>

To calculate heat production, multiply ml CO₂/kg·hr by 440 to get BTU/ton/day or by 122 to get kcal/metric ton /day.

Rates of Ethylene Production

Ethylene production rates increase with ripening and storage temperature [<0.1 µl/kg·hr at 0°C (32°F) to 4-6 µl/kg·hr at 20°C (68°F) for firm-ripe apricots and higher for soft-ripe apricots].
RESPONSES TO ETHYLENE

Exposure to ethylene hastens ripening (as indicated by softening and color changes from green to yellow). Also, ethylene may encourage growth of decay-causing fungi.

RESPONSES TO CONTROLLED ATMOSPHERES (CA)

The major benefits of CA during storage/shipment are to retain fruit firmness and ground color. CA conditions of 2-3% O₂ + 2-3% CO₂ are suggested for moderate benefits; extent of benefits depends on cultivar. Exposure to <1% O₂ may result in development of off-flavors and >5% CO₂ can cause flesh browning and loss of flavor.

PHYSIOLOGICAL DISORDERS

Gel Breakdown or Chilling Injury. This physiological problem is characterized in the earlier stages by the formation of water-soaked areas that subsequently turn brown. Breakdown of tissue is sometimes accompanied by sponginess and gel formation. Fruit stored between 2.2-7.6°C (36-46°F) have short market life and lose flavor. Market life is also related to cultivar.

PATHOLOGICAL DISORDERS

Brown Rot. Caused by Monilia fructicola is the most important postharvest disease of apricot. Infection begins during flowering. Fruit rots may occur before harvest, but often occur postharvest. Orchard sanitation to minimize infection sources, pre-harvest fungicide application and prompt cooling after harvest are among the control strategies.

Rhizopus Rot. Caused by Rhizopus stolonifer occurs frequently in ripe or near-ripe apricot fruits held at 20 to 25°C (68 to 77°F). Cooling the fruit and keeping them below 5°C (41°F) is very effective against this fungus.
POSTHARVEST PHOTO GUIDE

MATURITY AND QUALITY

MATURITY AND RIPENESS STAGES

MECHANICAL DAMAGE

DISORDERS

BROWN ROT
It is the policy of the University of California not to engage in discrimination against or harassment of any person, employed by or seeking employment with the University, or in any of its programs or activities, on the basis of race, color, national origin, religion, sex, gender, gender expression, gender identity, pregnancy, physical or mental disability, medical condition (cancer-related or genetic characteristics), genetic information (including family medical history), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services, as well as state military and naval service. This policy is intended to be consistent with the provisions of applicable state and federal laws and University policies. University policy also prohibits retaliation against any employee or person seeking employment for bringing a complaint of discrimination or harassment pursuant to this policy. This policy also prohibits retaliation against a person who assists someone with a complaint of discrimination or harassment, or participants in any manner in an investigation or resolution of a complaint of discrimination or harassment. Retaliation includes threats, intimidation, reprisals, and/or adverse

In addition, it is the policy of the University of California to undertake affirmative action, consistent with its obligations as a Federal Contractor, for minorities and women, for persons with disabilities, and for covered veterans. The University commits itself to apply every good faith effort to achieve prompt and full utilization of minorities and women in all segments of its workforce where deficiencies exist. These efforts conform to all current legal and regulatory requirements, and are consistent with University standards of quality and excellence. In conformance with Federal regulations, written affirmative action plans shall be prepared and maintained by each campus of the University of California, by the Lawrence Berkeley National Laboratory, by the Office of the President, and by the Division of Agriculture and Natural Resources. Such plans shall be reviewed and approved by the Office of the President and the Office of the General Counsel before they are officially promulgated. Inquiries regarding the University’s equal employment opportunity policies may be directed to the Affirmative Action Contact, University of California, Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618 (530) 750-1318.