Ellen Thompson and John R. Clark

The story of Prime-Ark® 45 in California is a tale of success. Released from the University of Arkansas in 2009, roughly five years has passed since the first commercial acreage of was planted. High productivity and favorable market prices in the late summer months, combined with the unique coastal climate and wide adaptability to a range of soil / water qualities have contributed to Prime-Ark® 45’s success. Current acreage in California is estimated at 600 - 700 acres. High tunnels covered with specialized plastics are commonly used on the coast. In the Central Valley, tunnel use is less common though sometimes shade cloth is deployed. Cane management is critical for success; both single- and double-tipping are used to remove apical dominance and force branching. Increasingly, canes are tipped by mechanical means. As with any success story, there are hurdles to overcome. Proper cane management (of tipping, postharvest storage and handling to prevent color reversion (rereddening of drupelets) are challenges that remain for growers.

Why tip primocan? Tipping primocanes of Prime-Ark® 45 at the right time is critical to remove apical dominance, promote branching, increase yield and maintain an easy picking height. Un-tipped canes (Photo 1) flower irregularly and produce little fruit on extremely tall canes (>3 m) compared with tipped canes (Photos 3 and 4). Tip once at 0.5 m (Photo 2) is not recommended, as branches grow long and flowering is moderately irregular. Strik and Buller (2012) showed no significant difference in yield for canes single-tipped at 1.0 m, (Photo 3) versus double-tipped canes (main cane tipped at 0.5 m and subsequent branches tipped at 0.5 m). NOTE: Do not tip a cane if buds are visible. Once a cane or branch has set flower buds, it is too late to tip.

Soft-tip versus Hard-tip: How much to remove? What matters most is that a primocanes are tipped at least once before bloom. Soft-tipping removes 5-10 cm (2-5 in) and can be done by hand. Hard-tipping removes 25-40 cm (5-15 in) and must be done using hand pruners or a mechanical device, because the diameter increases and the cane becomes woody. Prime-Ark® 45 grows in flushes, thus by waiting for the majority of canes to grow, fewer passes can be made. If double-tipping, the main cane can be hard-tipped, while the branches should be soft-tipped while still vegetative (approx. 40-50 cm long).

Color Reversion: What is it? Color reversion is a disorder that manifests only after cold storage. Seen in Photos A and B, single or clusters of drupelets have changed from black to red after being placed in cold storage (34 °F / 1 °C) for 7 days. For clarification, berries in photos C, D and E are not affected by color reversion. Rather, Photo C displays sunburn, or UV damage. Photo D shows an unripe berry that is slightly bronzed. Photo E is an example of Red Berry Mite (Aculbus excis). damage, common in California in the late summer months.

How can it be prevented? The long-term answer is genetic screening and use of low-reversion scoring varieties. While Prime-Ark® 45 is considered low-scoring, it can be prone to revert under specific conditions, including: 1) large swings in temperature (eg., removing field heat rapidly with forced cooling <30 °F < 1 °C), 2) rain events, 3) heat events; 4) near-freezing temperatures when positioned too close to refrigeration units used in trucks. Other possible causes may include poorly balanced nutrition and low UV light in high tunnels.

<table>
<thead>
<tr>
<th>Year / Treatment</th>
<th>Cycle</th>
<th>Avg. berry wt (g)</th>
<th>Avg. yield / plant (lb)</th>
<th>Avg. yield / plant (kg)</th>
<th>Avg. harvest defects (%)</th>
<th>Avg. Reversion (%)</th>
<th>Avg. soft (%)</th>
<th>Avg. leaky (%)</th>
<th>Soluble solids (% Brix)</th>
</tr>
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<tbody>
<tr>
<td>2013</td>
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<tr>
<td>D Floricane</td>
<td>12.5</td>
<td>8.7</td>
<td>3.9</td>
<td>-</td>
<td>20</td>
<td>1</td>
<td>1</td>
<td>11.6</td>
<td></td>
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<tr>
<td>S Primocane only</td>
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<td>11.9</td>
<td>5.4</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>2014</td>
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<tr>
<td>D Floricane</td>
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<tr>
<td>S Primocane only</td>
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<td>5.2</td>
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<td>80.0</td>
<td>88.0</td>
<td>8.2</td>
<td>9.2</td>
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*Defective fruits were separated and weighed, which included deformed, doubles and overripe berries.
*Berries were evaluated after 7 days in cold storage (34 °F / 1 °C) for clusters of drupelets that had turned from black to red.
*Berries were evaluated after 7 days in cold storage (34 °F / 1 °C) on a yes/no scale for softness.
*Berries were rolled on a paper towel after 7 days in cold storage (34 °F / 1 °C) to determine presence of leaky fruit.