

## **Topred Best Handling Practice Guideline**

### **Cultivars:**

Topred, Starking, Starkrimson, Early Red One, Red Chief, Oregon Spur, Jeromine, Romeo, African Carmine

### **Harvest Maturity:**

- DALRRD Minimum Standards:
  - Minimum starch breakdown: 8%
  - Minimum pressure: 5.9kg
  - Minimum pip colour: 2/3 brown
- Industry Optimum Harvest Maturity (for long term CA storage):
  - Minimum starch breakdown – 15-30%
  - Minimum pressure – 7.2kg
    - African Carmine – 6.8kg
  - Minimum TSS – 12%
  - Minimum pip colour – 2/3 brown
- Harvesting red cultivars overmature and attempting to store for long-term CA is the biggest issue with regards to quality problems.
- Post-optimum fruit should not be stored for long-term CA.

### **Harvesting Process:**

- Red cultivars do bruise, so watch out for rough handling and emptying of picking bags.
- Torn-out stems can also become a problem when there is rough handling.
- Leaving sunburn in orchard run bins should be considered if fruit are to be stored, because it can lead to scald in CA.
- Cover the bins with wet blankets during transport from the orchard to bin off-loading area.
- Deliver fruit from orchard to packhouse on the same day.

### **Fruit receiving:**

- Drench incoming fruit
  - Chlorine drench @ 100ppm.
  - Test chlorine concentration every 200 bins to ensure effective treatment.

### **Pre-cooling:**

- Red cultivars are to be cooled to a core temperature of -0,5°C within 48 hours of harvest and held at that temperature during storage.
- Place fruit under refrigeration within 24 hours from start of harvesting.
- Every coldroom has a maximum cooling capacity, and that should be adhered to.
  - If the coldroom was designed to effectively cool down 200 bins per day, don't overload it.
  - Rather switch on an extra coldroom to have enough capacity for cooling incoming fruit effectively.
  - Loadshedding will have a negative impact on the cooling capacity.

### **CA:**

- Loading should not take longer than 7 days, during which time effective cooling must take place (see pre-cooling above).
- Relative Humidity: 90-95%
- Storage regime for red apples should be as indicated in the CA Manual (January 2019).

Cultivar		O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Temperature (°C)	Storage Period (months)	Treatment
Topred	Optimum:	1.5	2.5 or 1.5	-0.5	9	SF / DCA
	Maximum:	2.0	3.0	0.0		
	Minimum:	1.0	1.0	-0.5		
African Carmine	Optimum:	1.5	1.5	-0.5	7	SF / DCA
	Maximum:	2.0	3.0	0.0		
	Minimum:	1.0	1.0	-0.5		

- Nitrogen flushing: attain a gas regime of 3% O<sub>2</sub> + 1.5% CO<sub>2</sub> within 48 hours of sealing the room. The CO<sub>2</sub> concentration must not exceed 2.5% during the pull-down period.
- Nitrogen generator: attain a gas regime of 3% O<sub>2</sub> + 3% CO<sub>2</sub> within 48 hours of sealing the room. The CO<sub>2</sub> concentration must not exceed 2.5% during the pull-down period.
- The following gas regimes should be reached within 7 days of sealing the room (i.e. within 14 days from start of harvesting):
  - 3.0% O<sub>2</sub>, 1.5% CO<sub>2</sub>
  - CO<sub>2</sub> levels should never exceed 2.5% to prevent possible damage to the fruit.

#### **Packing:**

- When packing wet, maintain a chlorine concentration of 100ppm in the flumes.
- Generally, pack in 20 micron bags.

#### **Re-cooling:**

- Forced air cooling of all pallets (including local) is important.  
Final fruit temperature of -0.5° should be reached within 72 hours after packing.

#### **Load out:**

- Container temperature set point at -0.5°C, vents open