

OVERVIEW OF EVALUATING CITRUS TO REGULATIONS AND BEYOND...

CITRUS FREEZE DAMAGE TRAINING

ROB MILNER

DURING A FREEZE EVENT



A freeze event can make for some fantastic photography



A citrus nursery operation trying to protect young citrus trees



Water used to add protection from freeze damage

RECENTLY PLANTED
YOUNG TREES



MATURE TREES BEARING
CROPS



Assessment of tree damage is also noted to determine recovery time and future losses

BARK SPLITTING IN CITRUS NURSERY TREES



TREE AND FRUIT DAMAGE IN 6 YEAR OLD LEMON TREES



We expect to start seeing freeze damage to sensitive varieties when temperatures are below 2.8C for 6 hours.

Cultural practices contribute to saving fruit during a freeze event and helps processors quickly find good fruit and eliminate bad.

Fruit can take longer and colder temperatures with cultural practices that help release thermal units i.e. running/flooding with orchards with water, wind machines, bare ground/no vegetation



60m above sea level

80m above sea level
WARMER TEMPERATURES

AFTER A FREEZE EVENT



Freeze damage assessments begins with field cutting citrus fruits to determine the extent of the damage

EVALUATING SENSITIVE VARIETIES



EVALUATING NAVEL ORANGE HARVEST IN COLDEST LOCATIONS



ENFORCEMENT



ENFORCEMENT AT RETAIL



ENFORCEMENT AT PRODUCTION



Watch out for each other and have patience!

Be sympathetic to losses,
and extra work for
growers, packers and
shippers

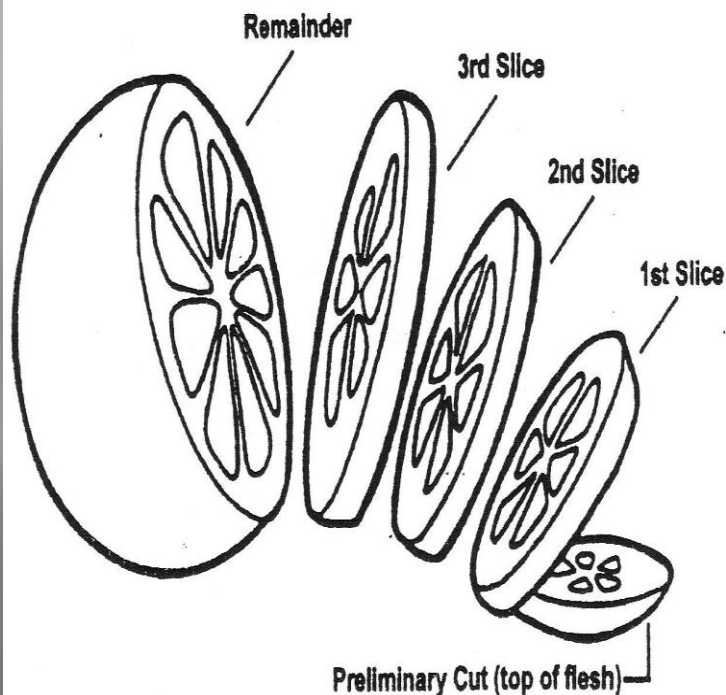
No giggling or joking
around

Be fair and firm on
your decisions

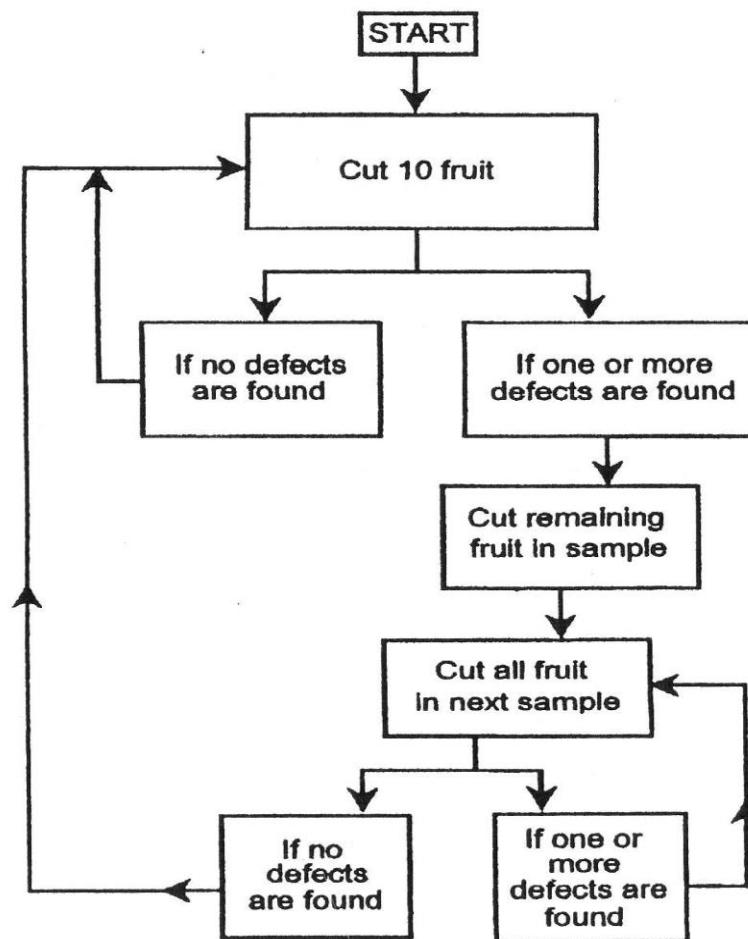


Federal/State Shipping Point inspections for US Fancy, US # 1 @ 5% lot tolerance

Cutting Instructions and Scoring Guide
for Dryness-Mushy Condition



PLAN A

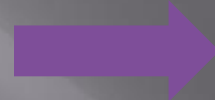


Freeze Damage

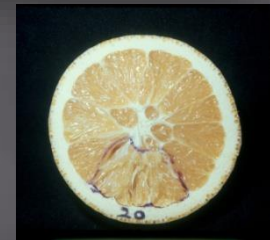
CDFA California Code of Regulations Section 1430.Citrus

3 different types of cuts used when
determining freeze damage to citrus

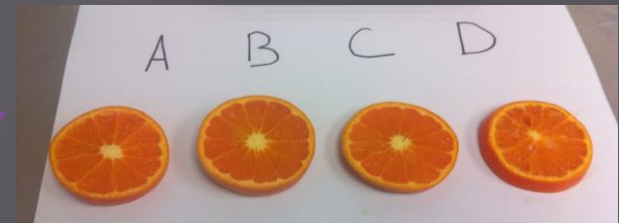
SEGMENT CUT



TRANSVERSE CUT



VOLUME CUT



Freeze Damage

Oranges

Segment Cut only until Date "A" is Declared

Date "A" Declaration

Utilization of Segment or Transverse Cut

Date "B" Declaration

Transverse Cut only

Maximum time allowed between
Date A and B: 3-Weeks

SEGMENT CUT FOR FREEZE DAMAGE

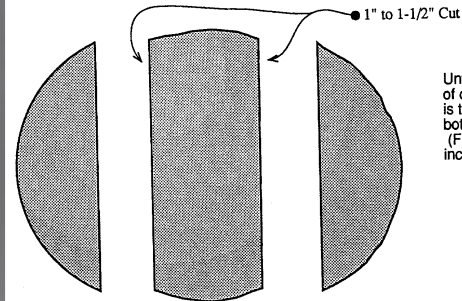


Figure A

Until the establishment of a date A, the only method of cutting an orange for freezing damage inspection is the segment cut. This cut is to be made by removing both ends of the orange leaving the center segment (Fig. A). This center segment to be not less than 1 inch or more than 1-1/2 inches in width.

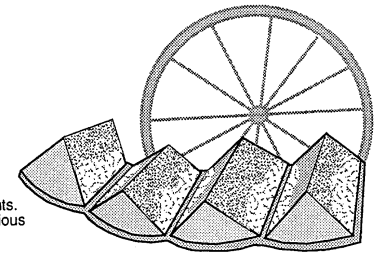


Figure B

Each orange must show damage to the entire length (not necessarily the entire areas) of both sides of two segments. Damage is a water-soaked appearance, evidence of previous water-soaking or the presence of crystals (Fig. B). The tolerance for this defect is 15%.

TRANSVERSE CUT

Cut the fruit in halves, between blossom and distal ends.

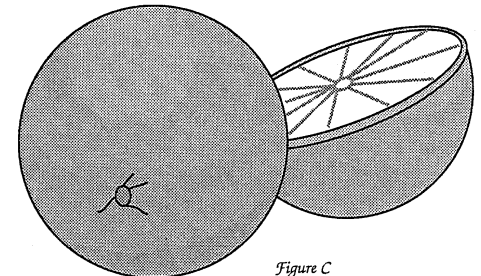


Figure C

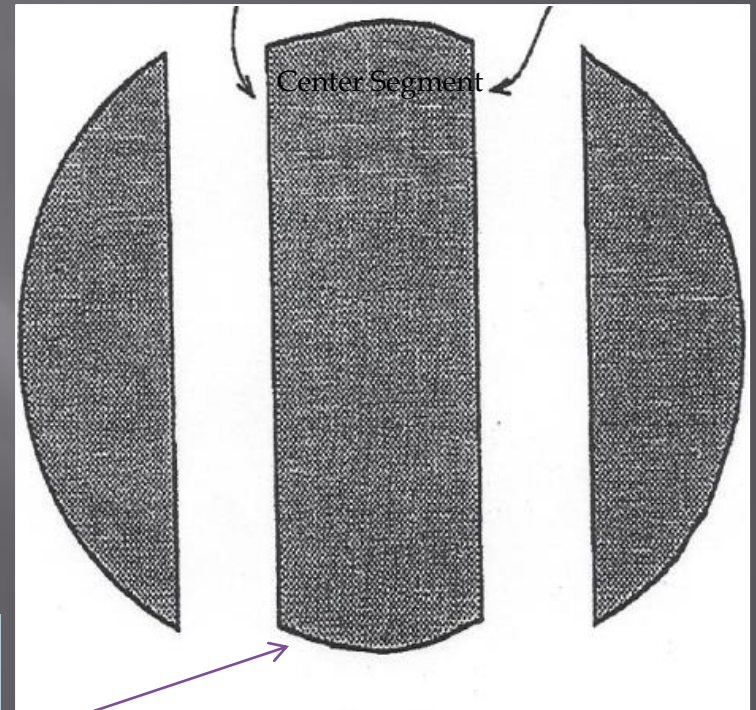
Freeze Damage

Oranges

Segment Cut

This cut is to be made by removing both ends of the orange leaving the center segment.

Center segment not
Less than 1" or more
than 1 1/2" in width



Freeze Damage

Oranges – Segment Cut

CCR 1430.39

(a) Segment wall damage includes a water soaked appearance, evidence of previous water soaking or the presence of crystals or crystalline deposits on 2 surface membranes of each of 2 or more segments, on the entire length but not necessary on the entire area of the membranes.

Lot tolerance is 15% by count



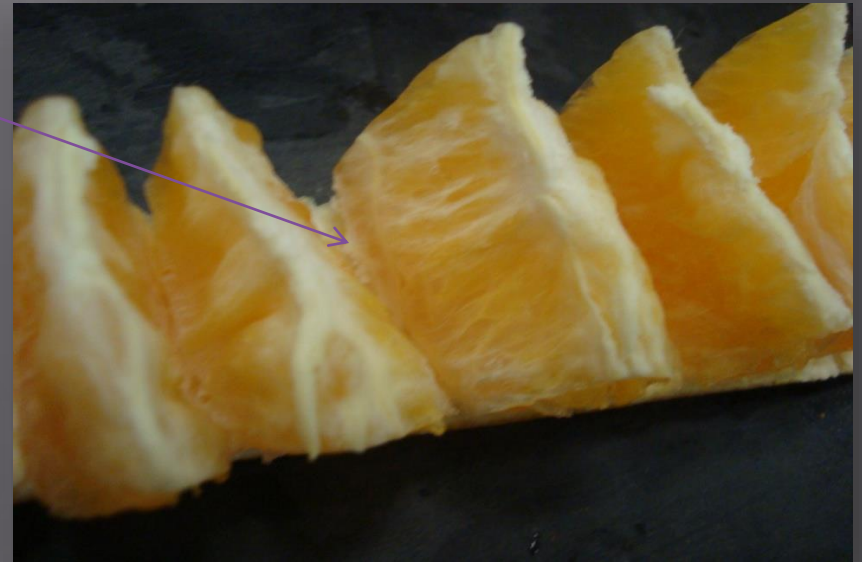
Freeze Damage

Oranges

Segment Cut

Must show damage to the entire length of both sides of two segments.

Tolerance: 15% by count



Freeze Damage

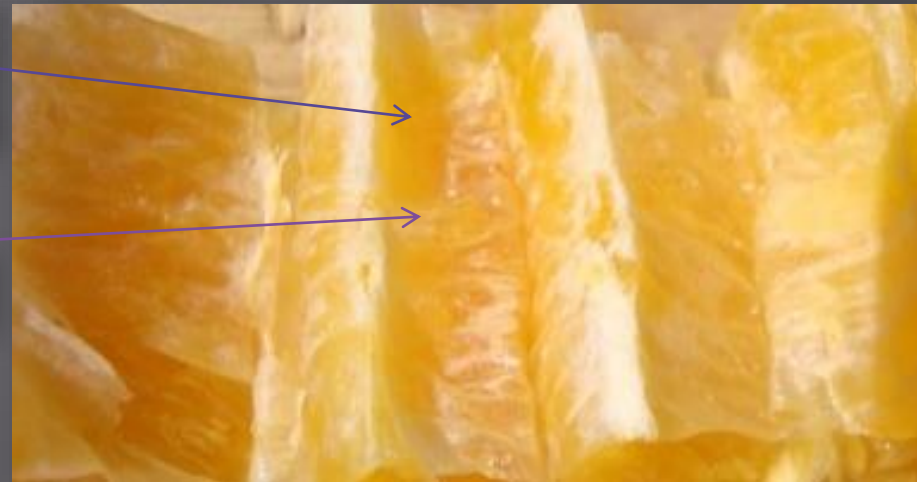
Oranges

Segment Cut

Ruptured Juice Sacs

Damage may appear water soaked.

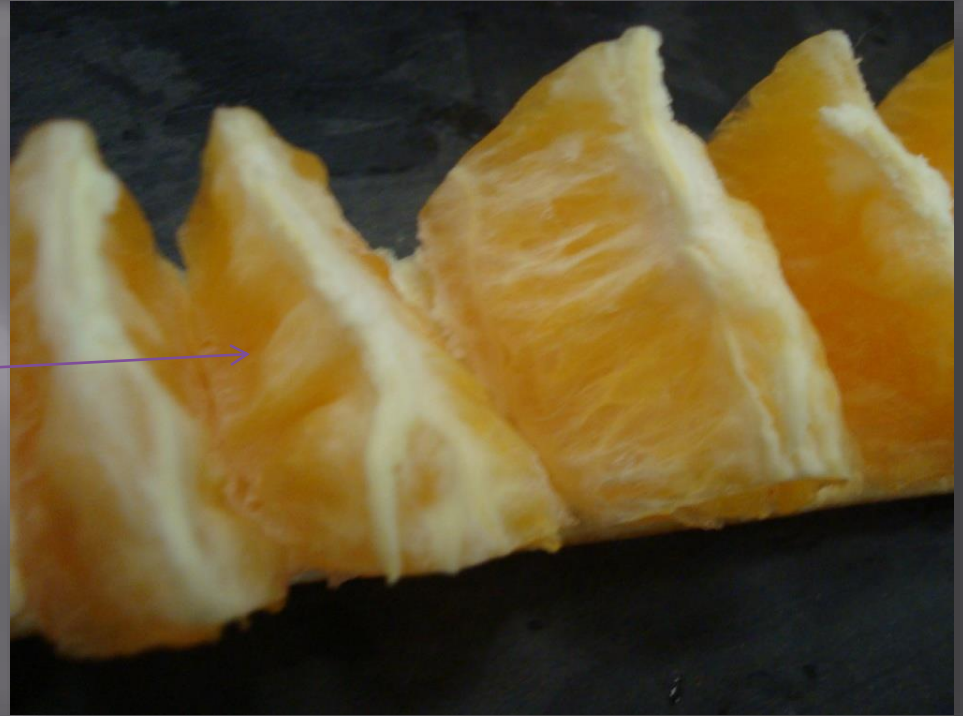
May have crystals present.



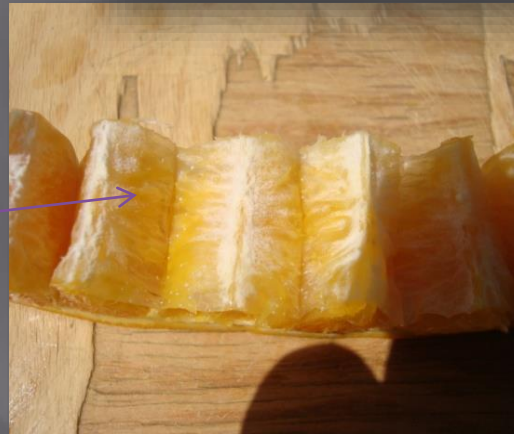
Freeze Damage

Segment Cut

Several days after:
buckling & separation of
partition walls appear
evident



Drying with possible
existing crystals



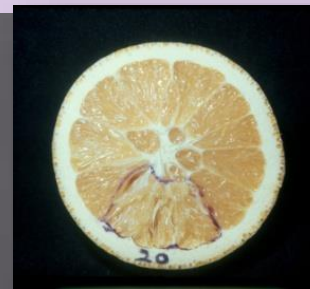
Freeze Damage

Oranges – Transverse Cut

CCR 1430.39 (b) Freezing if 20% or more of the pulp or edible portion as shown on a transverse cut through the center shows evidence of staining, drying, desiccation or a mushy condition

CCR 1430.44 (b) Damage by freezing is very serious if 40% or more of the exposed pulp shows evidence of drying, desiccation or mushy condition on a transverse cut through the center

Lot Tolerance: 15% by count showing 20% damage including not more than 5% lot tolerance showing 40% damage

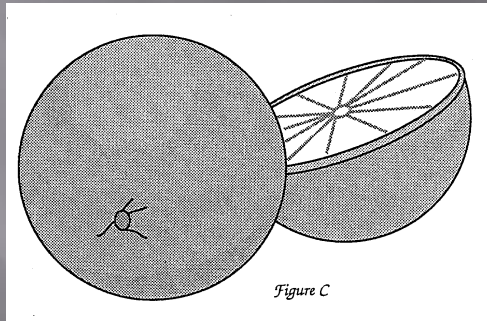


Freeze Damage

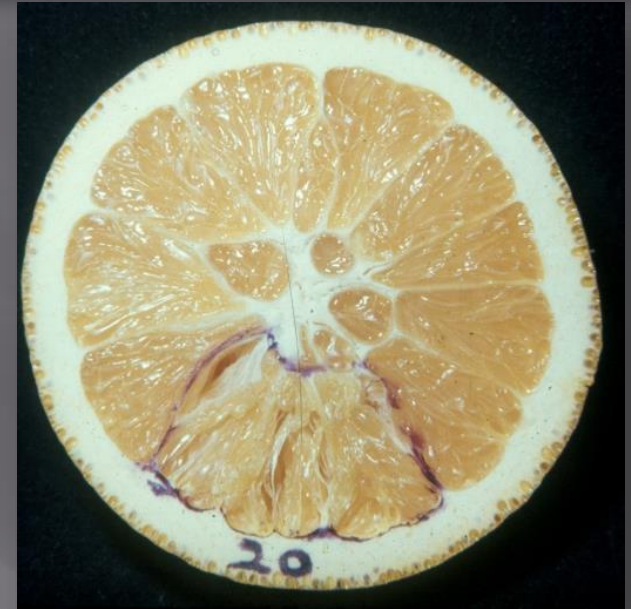
Oranges

Transverse Cut

Cut fruit in halves between blossom and distal ends.



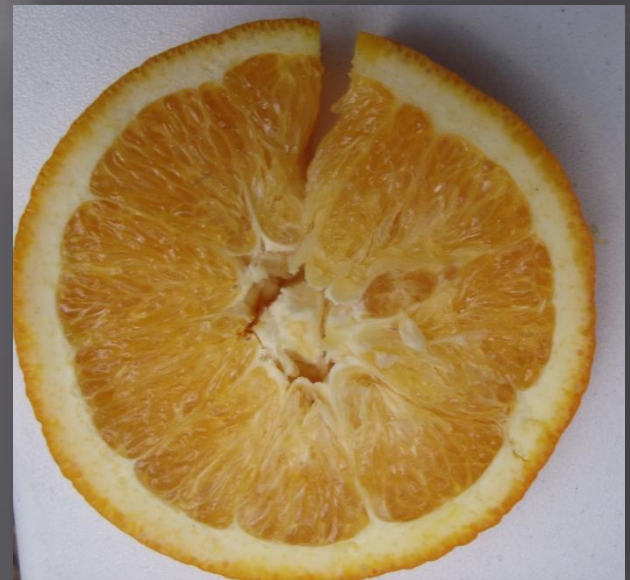
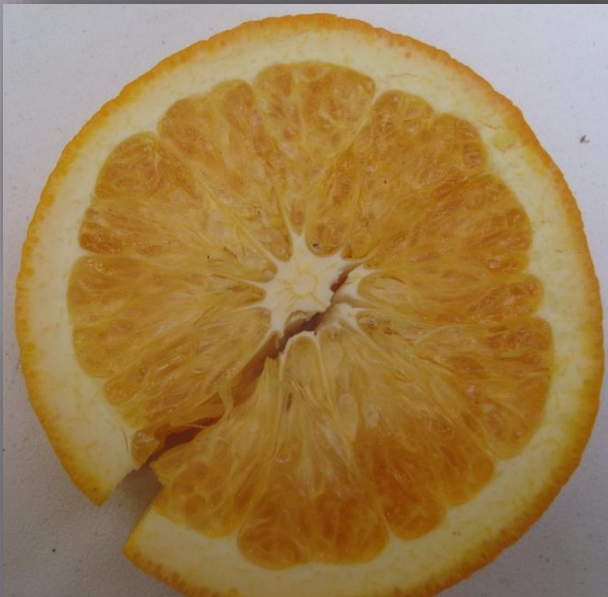
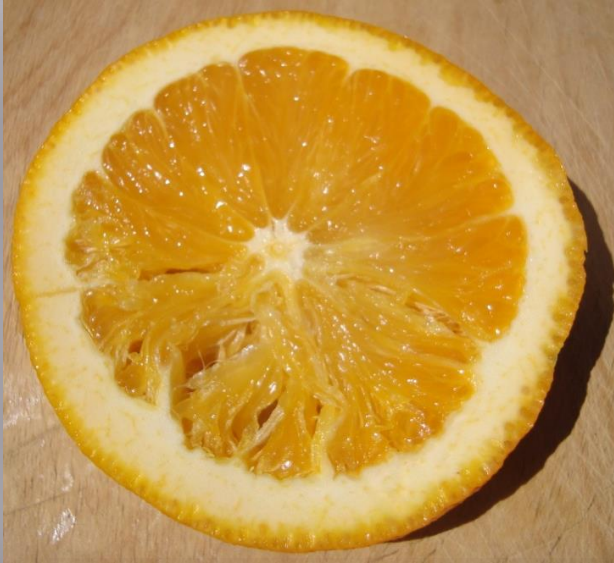
15% by count showing 20% damage including;
not more than 5% showing 40% damage.



Freeze Damage

Oranges

Transverse Cut



Freeze Damage

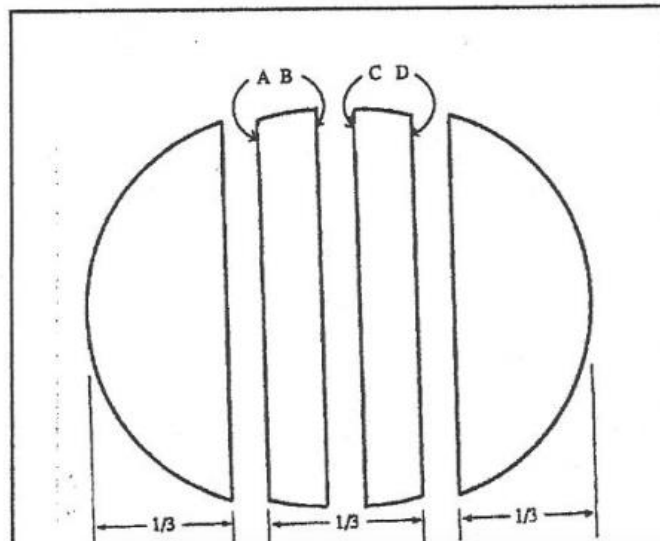
Volume Cut

Each fruit must show 20% or more damage, by volume, before rejecting it.

Cut the fruit in thirds crosswise with stem and blossom ends removing and discarding a third from each end. Save the center third from each end. Save the center third section and divide into equal cross cut halves.

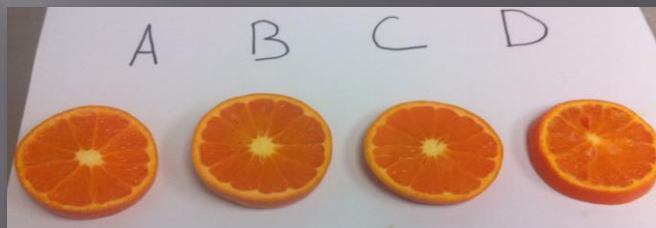
Each side of the four center cut surfaces represents 25% of the volume of the fruit. Add the area of damage on each of the four surfaces and divide by four to obtain the volume of the damage.

Example:
Damage



Side a	50%
Side b	10%
Side c	5%
Side d	+ 0%

$\div 4 =$ 16.25% Volume -
passable

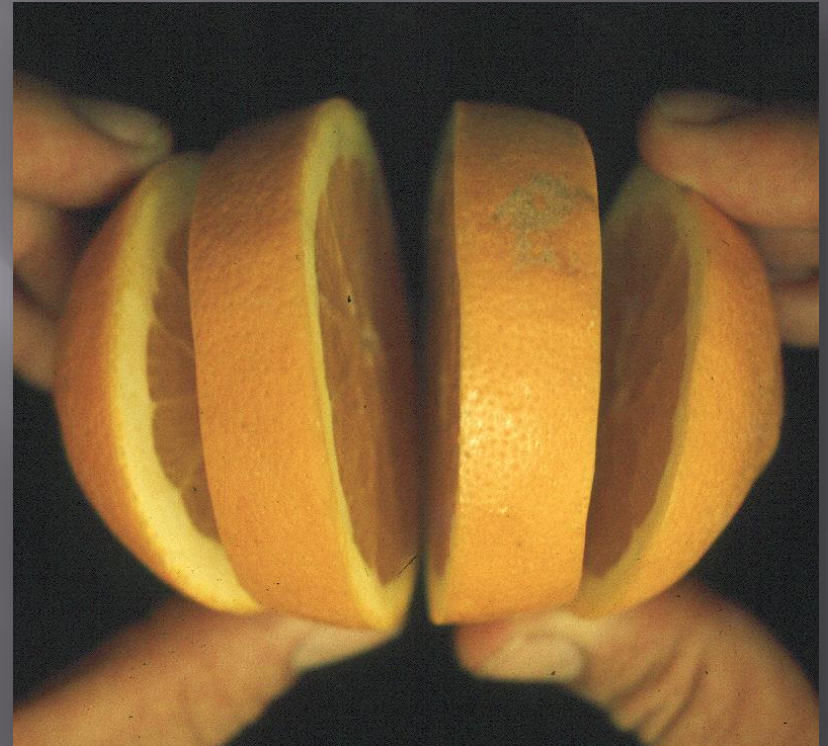


Freeze Damage

Volume Cut

Volume Cut to be used to
determine Freeze
Damage & Drying due
to other causes

Mandarins
Lemons
Grapefruit
Limes



Volume Cut to be used for **Oranges** only for
drying due to causes other than “Freezing”

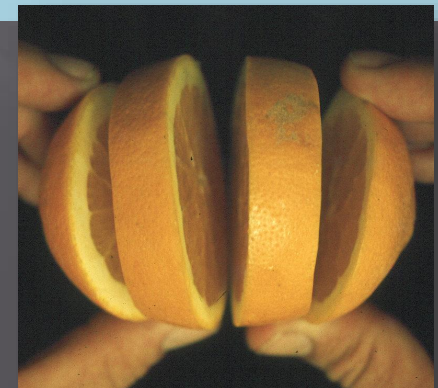
Freeze Damage

Mandarins – Volume Cut

CCR 1430.48

Such damage is serious if 20% or more of the pulp or edible portion of the fruit shows evidence of drying, desiccation or mushy condition.

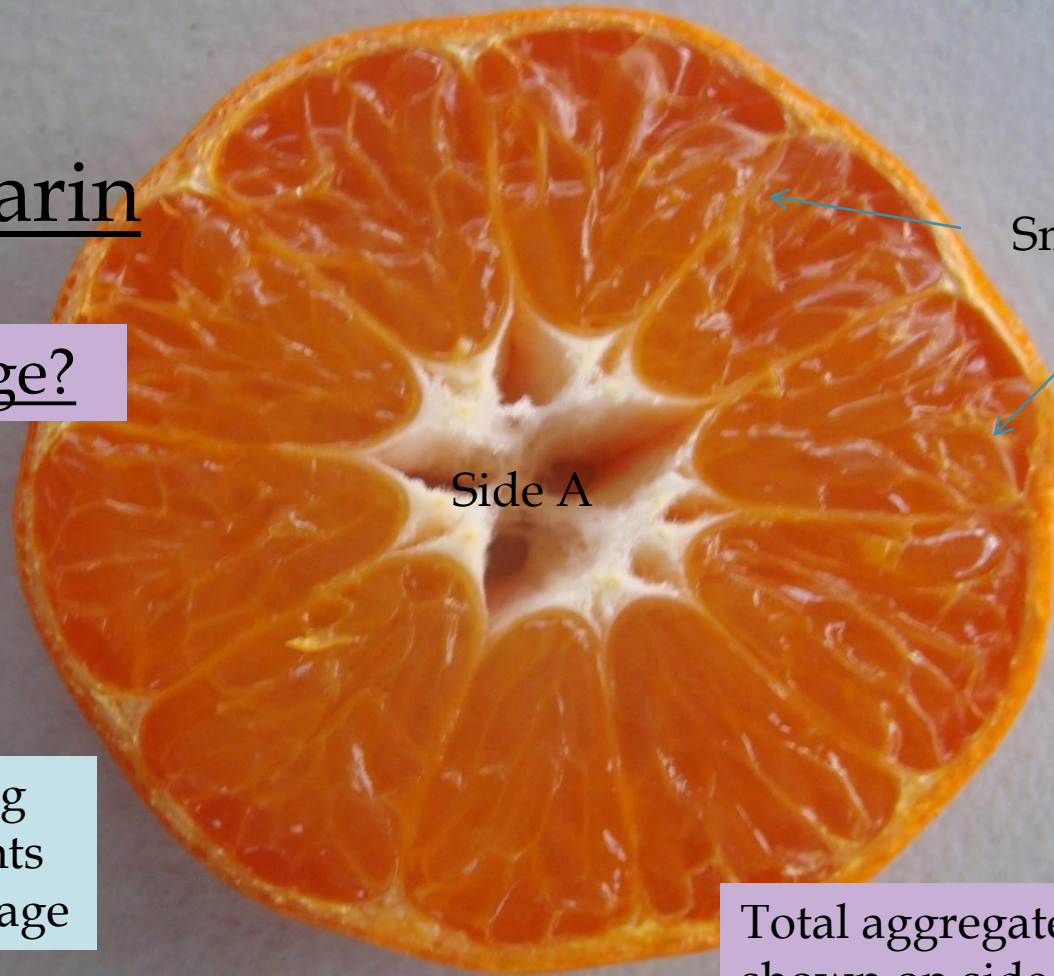
Lot Tolerance is 10%



Freeze Damage

Mandarin

Scorable Damage?



Estimate by counting
segments- 10 segments
1 segment = 10% damage

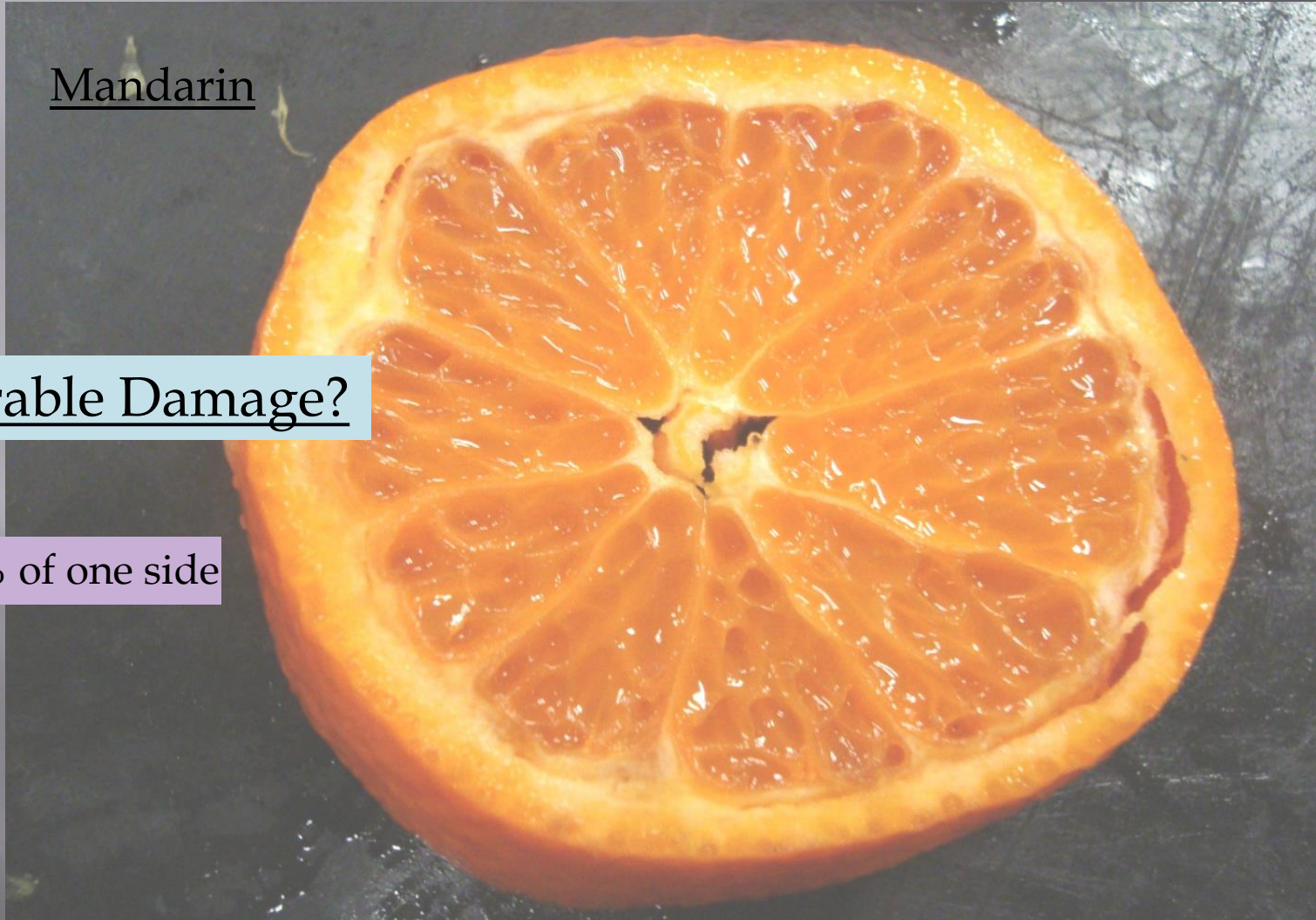
Total aggregate damage
shown on side A = 15%

Freeze Damage

Mandarin

Scorable Damage?

100% of one side

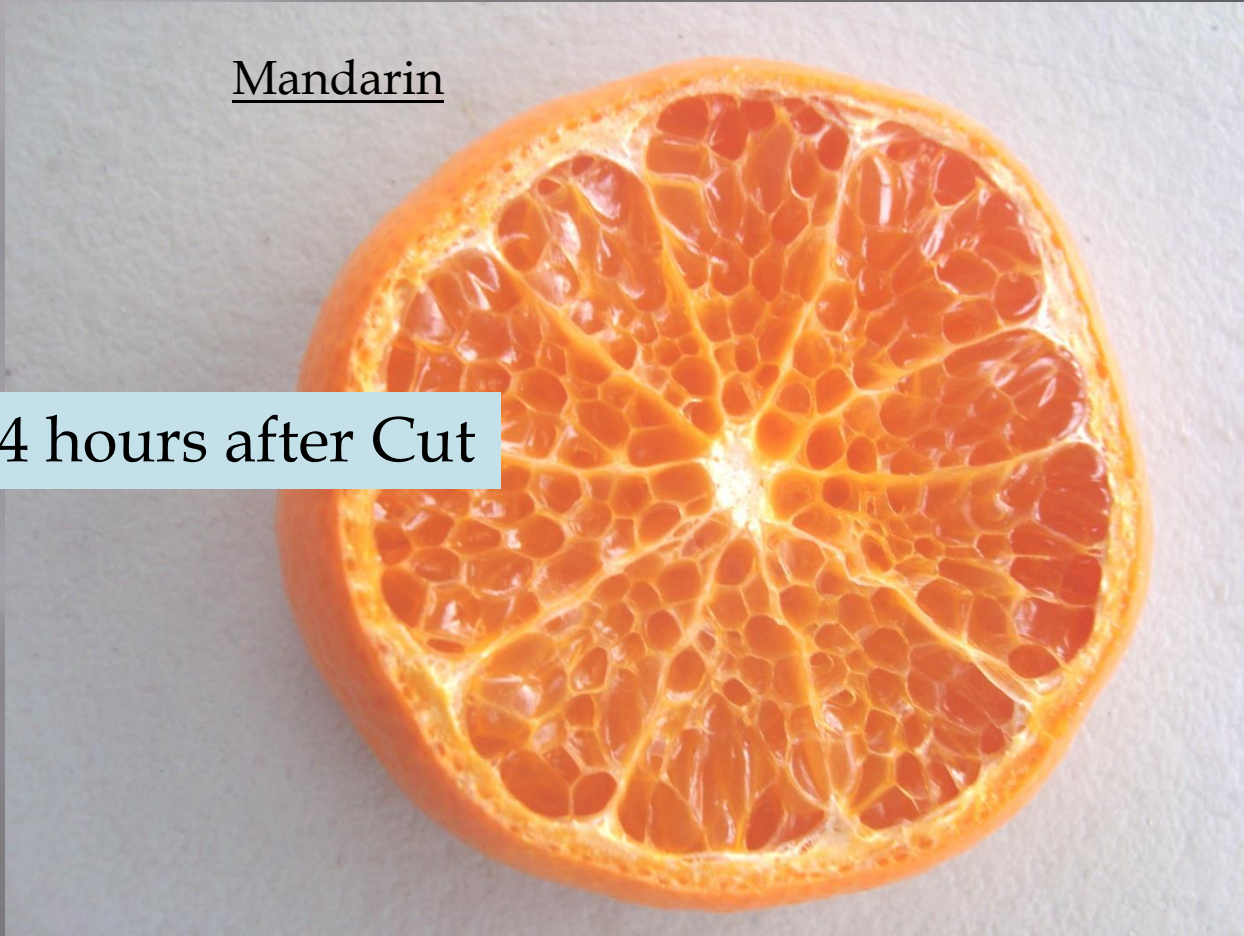


Juice Sacs Ruptured

Freeze Damage

Mandarin

Within 24 hours after Cut



Freeze Damage



A TYPICAL CUTTING STATION

Two lots were rejected.

Size 24's at 18 percent

Size 36's at 19 percent

Record keeping is maintained on standardized CDFA forms that are used to verify county inspections for F&V contract reimbursement



Freeze Damage

Lemons – Volume Cut

CCR 1430.30 If 20% or more of the pulp or edible portion shows evidence of drying or a mushy condition.

- 10% lot tolerance -

Damage by freezing is very serious if 40% or more of the pulp or edible portion of the lemon shows evidence of a mushy condition.

- 5% lot tolerance -

Tolerance is:

10% Lot - 20% fruit damage

5% Lot - 40% fruit damage

5% is included in overall 10% tolerance.



A Rejected Lemon Lot



Notice the dried stems!
We determined the pickers were
picking freeze damaged fruit off the
ground to cause this lot rejection

NONCOMPLIANCE & DISPOSAL ORDER

Production
Non-compliances

Wholesale
Non-compliances

Retail
Non-compliances

Disposal Orders

PRODUCTION NONCOMPLIANCE

State of California
Department of Food and Agriculture
FRUIT AND VEGETABLE QUALITY CONTROL
FS-003 (Rev. 3/84)

☐ Production ☐ Wholesale ☐ Retail

County 1 No. **490000**

Date 2 Time 3 P.M. Date 4

1. TO 5
Person in Possession or Applicant

Address 6

2. 7
Other Financially Interested Party or Carrier

Address 8

You are hereby notified that the following described commodity fails to conform with the provisions of the Food and Agricultural Code.

Commodity 9 Amount 10

Identification marks 11

LOCATE A/LON 12
Address or License Number

SECTION VIOLATED 13

☐ NOTICE ON NONCOMPLIANCE

VIOLATION ☐ Having in Possession ☐ Offering for Sale ☐ Transporting

14

NOTICE: (1) The above described lot, including the containers thereon, is a public nuisance. It is unlawful to remove the lot from its present location except under the written permission of an authorized enforcing officer. Unless such lot held by the enforcing officer is reconditioned or

otherwise brought into compliance by no later than 15 o'clock (a.m.) (p.m.) Month

Year 16
or written consent to destroy or otherwise dispose of said lot shall have been given to the enforcing officer by the person named with notice of non-compliance, the commodity or commodities are subject to the order of any court or competent jurisdiction to destroy such lot or otherwise state the nuisance.

Enforcing Officer 17
Signature

Address or Phone Number 18
CODE

☐ DISPOSAL ORDER ☐ PERMIT SECTION

You are hereby notified that the above described lot shall be delivered only to the person and at the destination specified herein, and shall not be disposed of except to values and over at destination, until allowed in writing by an enforcing officer at destination. No other disposition is permitted unless first authorized in writing by an enforcing officer.

I hereby agree to: ☐ Bring into Compliance ☐ Transport Lot to

19

for 20

REPORT TO: 21

SIGNED 21

1. County name.
2. Current date.
3. Time Noncompliance was issued. Circle A.M. or P.M. whichever applies.
4. Does not apply.
5. Name of packer.
6. Street, city, state, and zip (if listed in the telephone directory - city, state, zip).
7. Name of other interested party such as grower, etc.
8. Name and address sufficient to locate the person.
9. Common name (not variety).
10. Amount. If bins, show amount in bins and approximate number of standard containers. Example: 3 bins, approximately 80 containers. If in containers other than bins, show the number and what type (carton, lug, wire bound, etc.).
11. Put as much information as is available.
12. Location: Shed floor, cooler, truck, trailer, etc.
13. Always check box and show, 42941.
14. Always check, "having in possession." The following statements should be used when they apply:

Quality: (commodity) "...exceeds tolerance for..." (Defect*).
Containers: (commodity) "...not in standard containers."
Container size: "x x"
Markings: (commodity) "...not marked with responsibility," etc.
Time must be filled out. Always allow at least 24 hours for reconditioning.
15. Name of person making rejection (must hold standardization certificate).
17. Always show phone number and include address, if necessary.
18. Always check, "bring into compliance." If dumped, show "dumped at owner's request."
19. Always give an indication of owner's intentions such as, "Recondition and hold for reinspection" or "Donate to charity," etc.
20. Report To: The phone number to contact for release and the name of agency or individual to contact.
21. Ask manager to sign. If he refuses, indicate, "refused to sign" and leave a copy.

*List the defect with the highest percentage first.

Fruit not passing inspections is rejected, held for disposition, either reconditioned until the lot passes or dumped to buy-products or cattle feed



Disposal Orders issued for rejected tangerines shipped to a processor for juice or reconditioning and re-inspection



Growers strip freeze damaged fruit off the trees to reduce tree stress and prepare for next year's crop



Customers are very judgmental when shopping for fruits and vegetables. They expect high quality and will turn to other options if they experience poor quality.



Why do we enforce regulations?

Consumers'
Protection

Preserve Industry
Values and Integrity



The End