



COSMIC CRISP®



QUALITY MANUAL

For Cosmic Crisp® WA 38 cv. produced in the territory United States of America.

Cosmic Crisp®

The Apple of Big Dreams™

Cosmic Crisp® is not a club variety, however it is a managed variety. After more than 20 years of research and testing, the WA 38 cultivar became one of the first releases of the Pome Fruit Breeding Program at Washington State University.

The origins of the breeding program took root from the desire of growers in Washington State to develop new apple varieties specifically bred to suit the climate and conditions of our region. The development of WA 38 cv. under the Cosmic Crisp® brand is a true collaboration with the growers, shippers and marketers of the Washington Apple Industry. In acknowledgement of their support, the WA 38 cv. has been offered to the growers of Washington State under an exclusive agreement covering all of North America for at least 10 years, beginning in 2017.

The industry has been provided with a product of great possibilities, characterized by amazing flavor, attractive appearance and excellent storage potential. To realize the dream, and make the Cosmic Crisp® brand the best it can be, each segment of the industry must take ownership in the project and put forth their best efforts to make this new apple a symbol of our industry we can all be proud of.



PVM'S ROLE IN THE COSMIC CRISP® LAUNCH

To manage the introduction of the enormously popular WA 38 cultivar, Washington State University contracted Proprietary Variety Management to oversee the commercialization of the apple and its brand, Cosmic Crisp®. PVM is charged with administering the intellectual property, quality standards, and the consumer marketing activities on behalf of the variety owner.

PVM receives feedback and support from three advisory committees, made from members of the industry.

The **Industry Advisory Committee** focuses on marketing activities.

The **Quality Standards Committee** provides input on grade and pack.

The **Horticulture and Technology Committee** looks at challenges faced by the grower base and provides input to the research teams.

Proprietary Variety Management

Office: 1330 North 16th Avenue Suite A , Yakima, WA 98902

Phone: 509-248-4315

Doug Carey

Title: Manager of Quality Control

Phone: 509-731-6280

Email: Doug@provarmanagement.com

Kathryn Grandy

Title: Chief Marketing Officer

Phone: 509-263-1227

Email: Kathryn@provarmanagement.com

Jill Burbery

Title: Idyia™ Administrator, Communications

Phone: 509-630-1882

Email: Jill@provarmanagement.com

Intellectual Property Infringement Investigations

Anonymous Tip Line: 509-422-1227

Email: IPprotection@provarmanagement.com

Kevin Brandt

Title: PVM Chief Operating Officer

Phone: 509-961-5820

Email: Kevin@provarmanagement.com

Tyler Brandt

Title: PVM VP, Tree Nursery & Grower Relations

Phone: 509-728-0143

Email: Tyler@provarmanagement.com

Why Managing Maturity in the Orchard is Key

Assessing maturity in the orchard and starting harvest at the appropriate time are 2 key factors in managing WA 38 cv. Cosmic Crisp® Brand Apples. Over-ripe fruit negatively impacts the production process and leads to increased cullage and shrink on the pack out. Marketing efforts will only be successful if the product offered for sale meets the expectations of the consumer. Assuring uniform quality, appearance and flavor across the industry will lead to customer satisfaction and place the apple in the premium category.

Problems related to harvesting overly mature fruit:

- Low Pressures
- Unattractive Background Color
- Greasy Skin
- Yellow Flesh
- Cracking in the Stem Bowl or Calyx
- Increased Bird Damage
- Less Likely to Store or Hold Well

Research has shown that fruit harvested above 3.5 starch clearance is more likely to exhibit some or all of the issues above. Over mature apples, especially those harvested from young trees (2 or 3rd leaf) have been observed to develop a heavy natural wax that we have yet to find an effective solution for on the packing lines. Greasy fruit is difficult to clean and commercial waxes do not adhere well, resulting in a patchy or dull appearance. Feedback from consumers indicates they are noticing unpleasant odors and flavors from heavily waxed fruit that does not bode well for repeat purchases. Although WSU, WTFRC, Packing Facilities, Wax Providers and PVM are collaborating to determine the best methods for dealing with natural wax, the best course of action is to make sure it never develops in the first place.

What to expect

Although fruit from 2nd leaf trees is allowed, juvenile and highly vigorous trees may produce inconsistent and poor-quality fruit. Consideration should be given to delaying commercial harvest until 3rd leaf.

Experience has shown us that cropping WA 38 cv. trees that have not adequately filled the space on the trellis can stunt tree growth and set tree development back up to a full year. It is recommended that growers do not fruit juvenile WA 38 cv. trees until the space is sufficiently filled by tree structure. A grower can expect harvest to take place 165-175 days after full bloom. The orchardist must consider factors such as crop load, tree age, location and juvenility when making harvest decisions.

Starch levels

The recommendation of the quality standards committee is to begin harvest when the starch clearance for the block reaches a minimum of 2.0 using the Cosmic Crisp® WA 38 cv. Starch scale.

Starches will continue to convert in the warehouse at a rate of approximately 1/2 point per week in regular atmosphere. Flavor development has reached a satisfactory level when the fruit reaches 5.0 starch clearance (10% dark stain remaining under the skin) on the Cosmic Crisp® WA 38 cv. starch scale, and the brix and acid levels have balanced. Warehouses are required to starch test every lot prior to packing to verify that 90% of the fruit in the lot has reached 5.0 starch clearance. This requirement is in effect until January 1 of the crop year. A grower lot found on the packing line or in the box that does not meet the starch clearance standard will be red-tagged and held until the standard is met.

Color Splits

WA 38 tends to color easily. To qualify as Washington Extra Fancy, fruit must display 50% to full good red color characteristic of the variety. Good red color is red with deep tones ranging from a bright red to a dark maroon. Lighter shades of red to orange color is considered compensating color and can be in addition to, but not in place of, good red color.

US Extra Fancy grade apples must display 30% to full good red color, or compensating color at a rate of 2:1. (example: 15% Good Red+ 30% compensating or -0- good red+ 60% compensating)

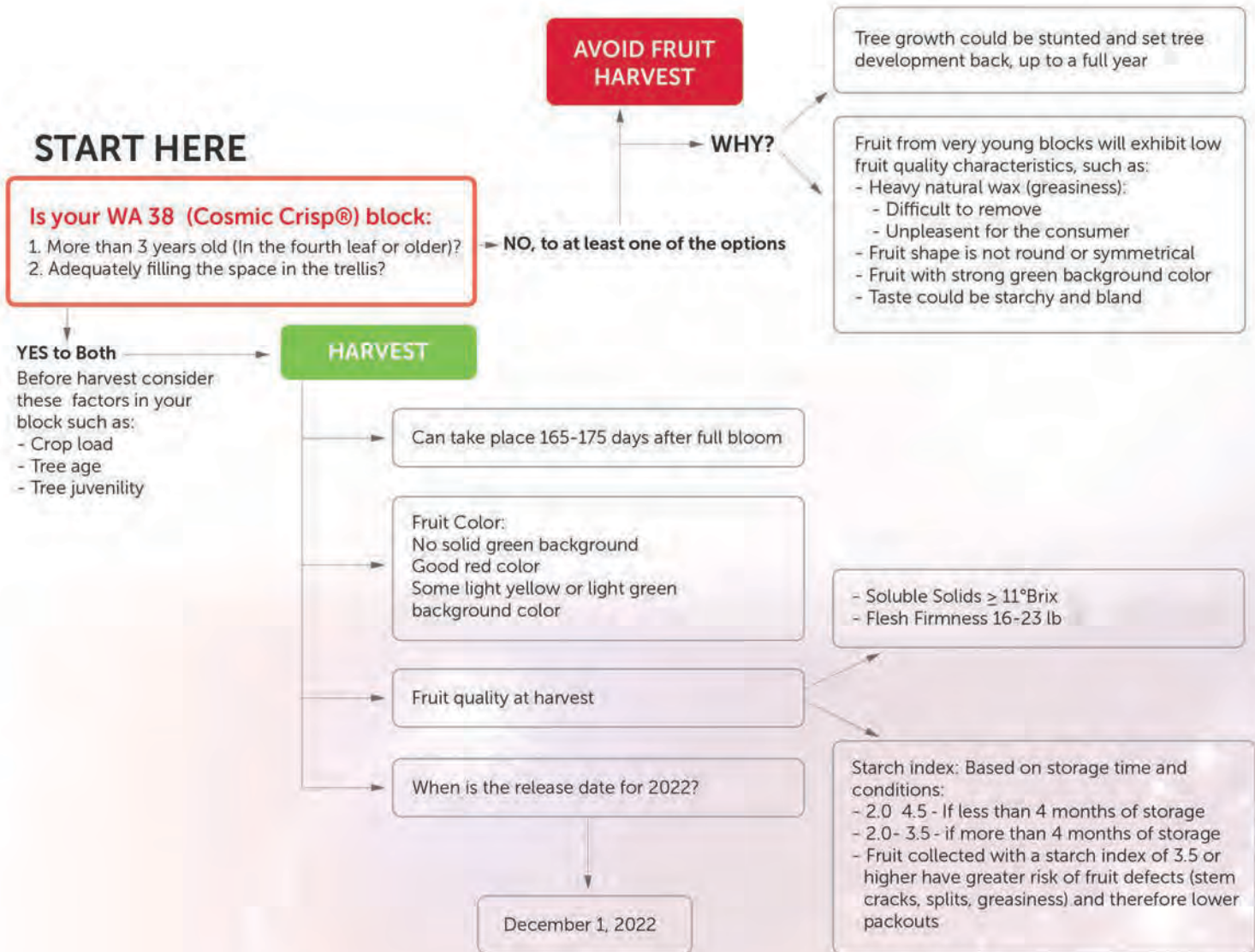
The background color must be breaking green to light yellow.

- Distinct yellow background at harvest indicates the fruit is over ripe.
- Fruit with hard green background color is not allowed in any commercial package.

Stem Clipping

Growers are strongly advised to clip stems at harvest. Stem clipping in the field significantly reduces cuts and punctures on the apple's surface and substantially diminishes decay and cullage in storage, and on the packing line, thereby extending the ability to hold and store the fruit in the warehouse as well as reducing shrink at retail.

Flow Chart



THINGS TO CONSIDER WHEN HARVESTING WA 38 FRUIT

Before Harvesting

Consider the following:

- Crop load
- Tree age
- Tree juvenility



When to Harvest

Can take place 165-175 days after full bloom

While Harvesting

- Harvest ONLY fruit that have developed red color, and/or have light yellow background color
- AVOID fruit with dark green background color
- CLIP STEMS. Clipping stems at harvest will reduce both stem punctures and future decay, allowing you to get higher packouts and returns.

Fruit Quality at Harvest

Fruit Color:

- NO SOLID GREEN background
- Good red color
- Light yellow or light green background color

Starch Index (SI):

- Harvest based on storage projection:
 - 2.0 - 4.5 - If less than 4 months of storage
 - 2.0- 3.5 - If more than 4 months of storage

- Fruit harvested with SI greater than 3.5 is likely to develop greasiness and is also susceptible to fruit disorders such as stem cracks, splits and bird pecks

Other

- Soluble Solids > 11°Brix
- Flesh Firmness 16-23 lb

Important Dates

2022 Crop Year

The release date for the 2022 Crop Year is:

Thursday, December 1, 2022

No shipments of commercially packed fruit may occur before this date.

In coordination with the release date, all lots are subject to mandatory starch testing and may not be packed unless 90% meet stage 5 maturity on the Cosmic Crisp® starch scale. This will be enforced until:

January 1, 2023

These specifications have been developed to ensure consistency of flavor, texture and appearance of Cosmic Crisp® WA 38 cv. apples across all production facilities in Washington State.

The primary focus should be on eating quality (starch, brix, firmness) and color to deliver upon the brand promises made to the consumer.

Recommended Harvest Criteria For Commercial WA38 Storage in 2022

Fruit destined for fruit stand sales: refer to PVM for the Farmgate Standards.



General harvest criteria & procedures for all fruit:

- Starch Index (1-6 scale) minimum of 2.0
 - To qualify for packing, 90% of fruit in a lot must have reached a starch clearance of 5.0. Fruit picked at 2.0 starch clearance will take an average of six weeks in RA storage to reach the required clearance. (example: Oct, 20 pick date + 6 weeks storage = Dec. 1)
 - Fruit harvested below 2.0 starch clearing will not develop good flavor.
 - Fruit harvested at or above starch clearance of 3.5 may result in lower yields and/or packouts due to increased stem bowl cracking, bird damage, and development of fruit greasiness in the orchard and/or in storage.
- Breaking background color
- Decay management: Stem clipping recommended, pre- or postharvest fungicide, bin & room sanitation
- Soluble solids concentration (*Brix) equal or higher than 11
- Firmness (in lbs.) of 23 or below
- Days after full bloom between 165 – 175
- Ethylene action or synthesis inhibitors preharvest (ReTain, Harvista, Etherol etc.): not recommended.
- DPA: not necessary (no superficial scald risk), but drench mixes with fungicide & DPA have not shown to cause phytotoxicity to date.

Young orchards (2 and 3- year old trees)

- Fruit maturity development will be more uneven.
- Excessive greasiness may appear on the fruit preharvest or in storage and is not controlled with 1-MCP.
- Heavy cropping of 2-year old trees may stunt tree growth and/or may induce biannual

Mature orchards (4 year old trees and older)

- Fruit maturity spread within trees should allow for one pick.

Storage and Packing

- Tasting fruit before packing and shipping is recommended to detect off flavors.
- Bitter taste is rare, and dissipates when fruit is held in RA after several weeks.

	Storage Duration	Starch Index	1-MCP recommended	Background Color	Additional Recommendations
RA	4 months	2 – 4.5	No	breaking	Refrigerated Air (RA): 32-34°F, >90% relative humidity (RH)
Short CA	4 months	2 – 4.5	No	breaking	Controlled Atmosphere (CA): 33°F, 1%CO ₂ , 2%O ₂
Mid CA	4- 6 months	2 – 3.5	No	breaking	
Long CA	6-12 months	2 – 3.5	yes	breaking	Mature orchards only: 1-MCP application may reduce greasiness for fruit harvested at advanced maturity (3.5-4.5)

The Starch Testing Requirement

Cosmic Crisp® develops its distinctive sweet-tart flavor after a brief rest period in storage. During this time, starches clear and sweetness becomes more intense as the soluble solids content (brix) increases and acidity decreases. (Hanrahan, 2019)

To help assure only those apples which have sufficiently developed the characteristic sweet-tart flavor of Cosmic Crisp® are offered for sale, a mandatory starch testing requirement is in place for all lots until January 1 of the crop year.

WA 38 cv. apples may not be packed for the fresh market unless 90% of the apples in a lot meet stage 5 of maturity as indicated by the Cosmic Crisp® WA 38 cv. Starch Scale.

Method

Prior to packing, the production facility must randomly select a minimum of 20 pieces of fruit from each lot and test for maturity using a starch-iodine solution. (Specific instructions on the following page) The Packer must record the results utilizing PVM's standardized form. These records must be retained, and made available to PVM representatives for review.

Should inspectors find fruit on the packing line or in a package that is out of compliance with the stage 5 starch-clearance standard, the entire lot will be red tagged and must be held until it is cleared for shipment by PVM. Re-tests may be submitted in 1-week increments.

Research indicates the rate of starch clearance post-harvest is approximately ½ point per week in regular atmosphere, therefore the starch testing requirement is waived after January 1.

Using the WA 38 Starch Scale Instructions



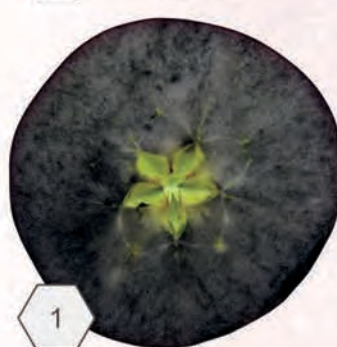
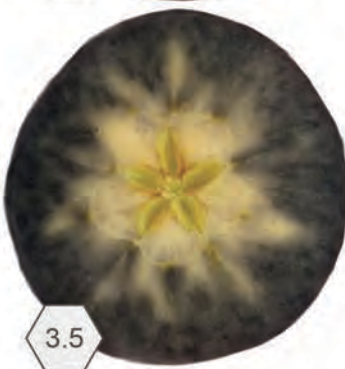
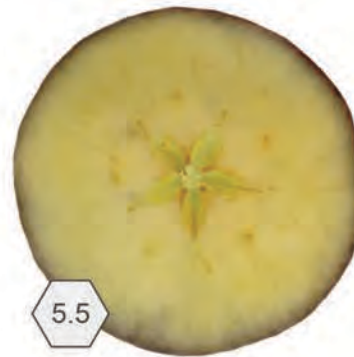
1. Stain apples as soon as possible after samples have been collected.
2. Cut apples in half through the equator.
3. Immediately dip, spray, or roll the cut apple surface completely with iodine solution.
4. Allow starch patterns to fully develop. It may take up to one hour to have the pattern fully developed, but starch readings are possible in less than 5 minutes.
5. Arrange the apples from most to least stained.
6. Compare each cut surface with the scale, every apple is assigned a whole or half number.
 - On this scale, 1 indicates immature fruit and 6 indicates fully ripe fruit.
 - An apple with no starch clearing in the core and cortex is assigned number 1.
 - If the core is half clear and the cortex is dark, the apple is assigned number 2.
 - When the core and the vascular bundles are free of staining, the apple will be assigned with number 3.
 - Apples with 50% cleared cortex are assigned with number 4.
 - **10% stain remaining under the skin means the apple will be assigned with number 5, which is the threshold for release to the Fresh Market.**
 - When the core and the cortex stay clear, the apple is assigned with number 6.
 - Samples with starch clearing between any whole or half number will be assigned with the closest higher number.
 - Two predominant starch patterns may appear: the Flower Pattern or the Radial Pattern.



Example of the cut line for WA 38

The reaction time for the iodine solution until fully dark is significantly longer for WA 38 than for other varieties

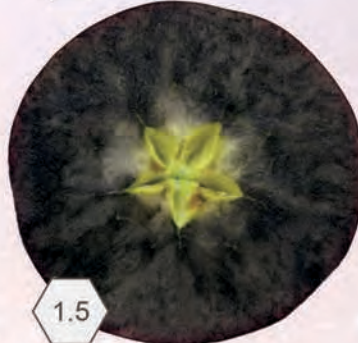
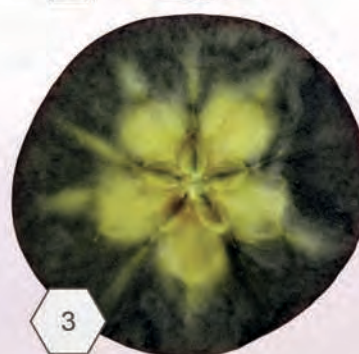
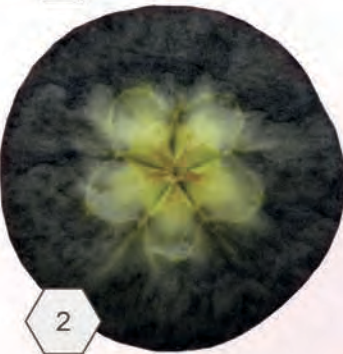
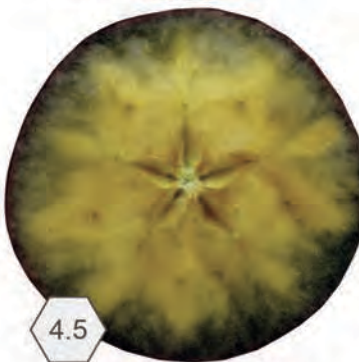
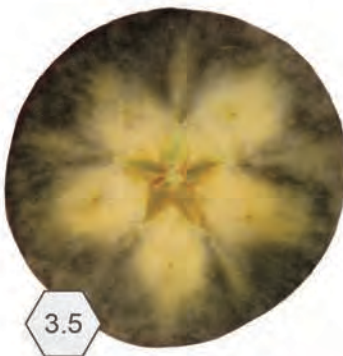
Radial Pattern



 RADIAL PATTERN

scs STORAGE CONTROL SYSTEMS
STORAGECONTROL.COM 800.487.7994 INFO@STORAGECONTROL.COM

Flower Pattern



 FLOWER PATTERN

 STORAGE CONTROL SYSTEMS
STORAGECONTROL.COM 800.487.7994 INFO@STORAGECONTROL.COM

Starch Testing Worksheet

Sample size: 20 apples

Starch/Iodine Requirement: 5.0 on the WA 38 Starch Scale
Tolerance: 10% under 5.0

APPLICANT:	Quality Control Inspector:
------------	----------------------------

Date:	
-------	--

Grower/Lot No.	
----------------	--

Size Range	
------------	--

Starch/Iodine Readings			
1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	

Lot Status:	Pass	Fail	Number of specimens less than 5.0:	Comments:
-------------	------	------	------------------------------------	-----------

These results must be made available to PVM for review

Grading Standards

For Cosmic Crisp® WA 38 cv.

Cosmic Crisp® WA 38 cv. will adhere to the defect standards set for apples marketed within the state of Washington per the Washington Administrative Code (WAC), for red, partial red, or blush apple varieties.

Section 16-403-145 General Standards

The apples must be mature but not overripe, clean, fairly well formed; free from decay, internal browning, internal breakdown, scald, scab, freezing injury, visible watercore, broken skins and bruises, except those which are slight and incidental to proper handling and packing. The apples are also free from injury caused by smooth net-like russeting, sunburn or spray-burn, limb rubs, hail drought spots, scars, disease, insects or other means; and free from damage by smooth solid, slightly rough or rough russeting, or stem or calyx cracks, Jonathan Spot (Green Spot), bitter pit and free from damage by invisible watercore after January 31st of the year following the year of production.

Section 16-403-044 Washington Extra Fancy Grade Standard

Apples must be free from injury and damage or combination of defects that detract from the appearance of the apple.

Two packed grades are allowed under the Cosmic Crisp® Brand:

- Washington Extra Fancy
- US Extra Fancy

Note: US Extra Fancy grade standards for defects and tolerances are the same as those standards for Washington Extra Fancy

Washington Extra Fancy

Qualifications

To qualify as Washington Extra Fancy, a minimum of 50% of the apple's surface must be covered with a good shade of solid red color characteristic of the variety. Good red color is described as red with depth to the tones ranging from bright to deep red, sometimes maroon.

Compensating color is defined as color that is a lighter shade of the good, solid red colors that are characteristic of this variety. Often, compensating color in the Cosmic Crisp® variety presents as "muddy", washed out, or orange rather than red.

Faded or pale stripes are not considered color.

Background color must be breaking green to light yellow.

No hard green background is allowed.

Compensating color may be in addition to, but not in place of, good red color characteristic of the variety in the Washington Extra Fancy Grade.

The fruit must be clean from scorable defects that detract from the overall appearance of the fruit. Individual production facilities may choose to segment the WA Extra Fancy grade as needed for uniformity of pack or to meet the needs of their customer base.

Packaging Options:

- Packer may choose high graphic or two-color packaging

Examples of Good Red Color



U.S. Extra Fancy

Qualifications

To qualify as U.S. Extra Fancy, a minimum of 30% of the apple's surface must be covered with a good shade of solid red color characteristic of the variety. Good red color is described as red with depth to the tones ranging from bright to deep red, sometimes maroon.

Compensating color is defined as color that is a lighter shade of the good, solid red colors that are characteristic of this variety. Often, compensating color in the Cosmic Crisp® variety presents as "muddy", washed out, or orange rather than red.

Faded or pale stripes are not considered color.
 Background color must be breaking green to light yellow.
 No hard green background is allowed.

Compensating color can be accepted as a substitute for 30% good red color in the U.S. Extra Fancy grade at a rate of 2:1. Example: 15% solid, good red color + 30% compensation color, or -0- solid, good red color and 60% compensating coverage).

U.S. Extra Fancy is not a "defect" grade or a "junk box". Fruit must be clean from scorable defects that detract from the overall appearance of the fruit. Note: defect tolerances for the U.S. Extra Fancy grade are the same as the tolerance for defects for the WA Extra Fancy grade category.

Packaging Options:

- Tray Pack or Euro bulk: Use two-color package designs
- Bag Packaging: Utilize high graphic pouch or poly bags with either a high graphic or two-color master carton.

**Examples of
Compensating Color**



**Examples of Not Red & Not
Compensating Color**



Defect and Tolerance Limits Summary

Based on Washington and U.S. Standards For Grades of Apples

	DEFECT	WASHINGTON EXTRA FANCY	U.S. EXTRA FANCY	Score against 5% Serious Damage Tolerance
	Percent of Color Required	50% to full good, red color No hard green background	30% minimum good red color OR compensating color at 2:1 No hard green background	-----
	Shape	Fairly well formed, typically round and symmetrical	Fairly well formed, typically round and symmetrical	Seriously deformed
	Limb Rubs/not russet type	1/4 - inch	1/4 - inch	1/2" diameter
	Sunburn and Sprayburn	Skin is blistered or cracked. Discoloration does not blend	Skin is blistered or cracked. Discoloration does not blend	Seriously detracting
Russeting outside the stem and calyx basins and limb rubs and sprayburns of the russet type	Smooth, Net-Like	10% of the surface If exceeded, score as injury	10% of the surface If exceeded, score as injury	15% of the surface
	Smooth, Solid	5% of the surface if exceeded, score as damage	5% of the surface if exceeded, score as damage	Over 50%
	Slightly Rough	1/2" If exceeded, score as damage	1/2" If exceeded, score as damage	if detracting
	Rough	1/4" If exceeded, score as damage	1/4" If exceeded, score as damage	Over 3/4" aggregate
Hail Marks, Drought Spots, Scars and Depressions	Skin not broken	1/2" If exceeded, score as injury 1/8" Each, 1/16" Deep	1/2" If exceeded, score as injury 1/8" Each, 1/16" Deep	Over 10%
	Skin broken/HEALED	NONE	NONE	Over 1/2"
	Healed Cracks: Stem, Calyx, Growth	1/4" If exceeded, score as damage	1/4" If exceeded, score as damage	Over 1/2"
	Thrip (aka Pansy Spot)	5/8" is considered injury 7/8" is considered damage	5/8" is considered injury 7/8" is considered damage	1-1/4" diameter
	Wandering Sepal	If materially detracting	If materially detracting	If seriously mis-shapen
	Scab Spots	NONE	NONE	Over 3/4"
	Healed Stings Includes hard encircling ring	1/8" If exceed score as injury	1/8" If exceed score as injury	Worm holes are serious damage
GREEN SPOT	Superficial	5% Aggregate	5% Aggregate	Materially detracts from appearance
	Severe (1 or more spots affecting the surface)	NONE	NONE	-----
	Bruises	1/8" depth, 5/8" diameter	1/8" depth, 5/8" diameter	3/8" depth, 1-1/8" diameter

Green Spot

Taken from Preliminary Observations on "Green Spot" symptoms in WA 38
Written by Bernardita Sallato, WSU Extension and Garrett Bishop, GS Long (2018)

and Rootstock and Nutrient Imbalance Leads to "Green Spot" Development in WA 38 Apples
Written by Bernardita Sallato, Matt Whiting and Juan Munguia (Dec 2021)

Description

Green Spot is a physiological defect identified in the fruit of the WA 38 cultivar. It is named for a green discoloration that can appear on the surface of the apple. Generally, it is located near the shoulder of the fruit. Visible symptoms typically appear late in the growing season, two to four weeks before harvest, in varying degrees.

Green Spot may appear as a superficial green russet or flecking that affects only the apple's peel. In severe cases, it can develop into distinct, green halos and necrotic tissue that affects the underlying flesh. At the far end of the spectrum, Green Spot causes the fruit to split and crack. Minor, or superficial cases of Green Spot discolorations may fade or color over as the fruit matures and more red color develops.

Causes and Management Strategies

Similar to Bitter Pit, Green Spot correlates with a Calcium deficiency. However, this deficiency should be considered a result rather than a cause.

The occurrence of Green Spot will vary by rootstock and year. It appears the influence of rootstock on Green Spot is highly related to vigor and fruit-to-shoot relationships. In the most recent trial, trees with a higher crop load exhibited a lower incidence of Green Spot.

Green Spot incidence, and its relationship with nutrient balance and rootstocks should be further investigated under different growing conditions, especially those conducive to excessive vigor.

Defect Tolerance

The defect allowance for Superficial Green Spot is an aggregate of 5% or less on the apple's surface. Aggregates of Superficial Green Spot larger than 5% are scorable and subject to tolerance rules. Severe Green Spot that affects the flesh as well as the skin is a no - tolerance item.



Superficial Green Spot scorable
and subject to tolerances



Superficial Green Spot
not scorable



Severe Green
Spot example

Pansy Spot

Pansy Spot is a white or light skinned scar caused by damage from the Thrips insect.

The surface markings left by Thrips are scored as follows:

- Scars up to 5/8" - Scored as injury
- Scars 5/8" to 7/8" – Scored as damage
- Aggregates larger than 1 1/4 inch are considered serious damage

Examples of Pansy Spot



Requirements of Trademark Use For Cosmic Crisp®

As a licensed Packer, you are authorized to use the Trademark only in connection with Licensed Apples that are harvested from duly and properly licensed or certified trees that have been grown in the state of Washington.

The fruit must otherwise meet required quality standards for the brand. Fruit that fails to meet the grade and quality standards may only be used, consumed, or sold for processing.

A licensed Packer must always positively support and promote Cosmic Crisp® as a trademark and not as a varietal name.

To indicate that the brand is a trademarked item, the words Cosmic Crisp® must always be referenced using the "registered symbol" any time the brand name is mentioned in advertising materials, signage, and on all packaging.

The requirement extends to the information your facility ink-jets onto the end panels of your boxes.



As Seen Here

Helpful Hint: You can edit the variety code in your equipment's software to include the symbol ® using the keystroke ALT + 1074, or by typing the left parenthesis, capital R, right parenthesis on a keyboard that does not have a 10-key.

Always Use Branded Packaging

The use of branded packaging is required for the sale and distribution of Cosmic Crisp® brand apples, both conventional and organic. Packaging has been designed with consumer appeal and acceptance in mind and coordinates with the elements of the over-arching consumer marketing program.

A variety of high graphic and two-color packaging designs are available in print-ready art files for you to apply to your own die lines in coordination with your licensed package manufacturer. Please send any edits, or additional packaging formats to the PVM Marketing department for review and approval.



See the full line of packaging options at <https://cosmiccrisp.com/resources>

PLU Stickers

Cosmic Crisp® utilizes a mushroom-shaped sticker format. The PLU artwork must be pre-printed. The bar code data must include the unique GTIN number your organization assigns to Cosmic Crisp®. Each sticker is additionally marked with an identifying micro-letter for each Sales/Marketing entity, to assist with identification and traceability. This number is assigned by the sticker manufacturer in conjunction with PVM.

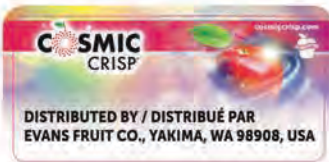


Example of the conventional and organic PLU sticker design for Cosmic Crisp®

Frequently Asked Packaging Questions

Our facility has run out of pouch bags and we need to pack....What do we do?

In the event of an emergency packaging shortage, you may utilize another facility's pouch bags. A branded Cosmic Crisp® label has been created which allows packers to cover the pre-printed information of another packer with their own "Distributed by" statements. The template for this label can be found under Packaging Resources > Conventional Packaging on the cosmiccrisp.com website. White labels or other non-branded labels are not allowed. As a reminder, the industry committees have chosen to maintain their own UPC codes which do not allow for non-printed bags.



Example of Pouch Bag Emergency Sticker

Download the zip file on the Packaging Resources Page or visit <https://cosmiccrisp.com/resources>

Can I use this sticker on Poly Bags?

No. This sticker is only for use with Pouch Bags. Packers must pre-print all legal requirements on the poly bag and/or place it on the KwikLoc. Warehouse labels of any kind are not allowed on Poly Bags.

Can I pack Cosmic Crisp® in our house label? Or my customer's private label?

No. Cosmic Crisp® is a brand, and our focus is to build recognition of the brand with consumers. Packers may not use house labels, private labels, clear or blank packaging.

Can I add my logo to packaging?

Yes! A packer may add a 1 x 1 inch company logo to the end panel of Euro or Tray Pack boxes in the "Distributed by" section of the lid. Please consult the Packaging and Brand Guide or the marketing department at PVM for more information.

Can I pack in RPCs?

In general, No. The exception is for bags and bulk shipped to WalMart, as they are moving to a fully automated receiving system. The marketing team is in discussions with the buyer about a branded crate tag.

We will be shipping product to Mexico. What do I need to know?

The work plan for products shipped to Mexico requires that all "Distributed by" information is preprinted on the end panels of the boxes. Boxes with ink-jetted statements are not accepted according to the work plan. You are advised to arrange with your packaging supplier to preprint all "Distributed by" information on the box end panels to assure you are in compliance.

Generic Cosmic Crisp® Waxing Protocol



Disclaimer: This is a living document meant to give general guidance. It will be adjusted as the industry gains more experience with packing this variety.

The current protocol was developed by an industry advisory group in consultation with packing line personnel, WSU, suppliers, the WA Tree Fruit Research Commission and PVM. This document is intended to provide general suggestions and will be updated when new information becomes available.

General Comments

For a good wax coating cleaning and preparing the apple is essential. For best results, don't rush the line. Apply a consistent speed and avoid stoppage. The key is to have dry and clean fruit as it hits the wax brushes. Cosmic Crisp® fruit, especially from young trees, can be greasy. As an industry, all efforts should be made to provide a consistent and enjoyable product to consumers. It is recommended to taste fruit before shipping.

Preparation of fruit before packing:

- Fruit can be packed straight out of cold storage.
- If no heat in dump tank/short brush bed: consider storing fruit at 50°F for up to 1 week or keep fruit at room temperature overnight.
- Run the line at a manageable speed, no "stop-go". Pushing fruit through the line too fast will also cause poor wax.
- Taste fruit: some lots are known to have off-flavor in the first 1-3 months of storage. If you encounter this situation, do not pack the fruit until the off-flavor dissipates (after approx. 3 months of storage).
- Decay: remove all decay before fruit hits the line.
- Starch clearing: if you plan to pack fruit before January 1, 2023, make sure it conforms to starch clearance protocols, see 2022 Marketing and Quality Standards: <https://quality.cosmiccrisp.com/> Note: this is a secure site, you must create a user ID.
- General thoughts: as a starting point, treat fruit like Red Delicious.

Dump Tank:

- Temperature: no optimum temperature established yet
 - Scenario 1, non-greasy fruit: 60-70°F
 - Scenario 2, greasy fruit: 90-100°F

Soap/Rinse:

- The general idea is to use the maximum amount possible to create "snowball suds". This will enable the wax to be emulsified (dissolved) within the soap suds and rinsed off that way. Otherwise, it is possible to have the wax brushes clog up. Give fruit time in the soap section, do not rush the process. Use a heavy blanket to hold down the fruit if your food safety plan allows for this.
- Before you use a new soap: check for sensitivity of fruit to lenticel breakdown (apply soap, leave fruit at room temperature, and observe for 2 weeks)
- Soap brushes: odd-even speeds (every other brush goes at the same speed, brushes next to each other run at different speeds, this creates a scrubbing action)
 - Ideal speed - Apples tumbling from one "pocket" pushing to the next. Look for rotation of fruit in "pocket" between brushes with NO bouncing over each other down the line. Slowest speeds should be used if lenticel breakdown is a concern.
 - When grease is extremely severe, try slowest speeds first. Increase brush speeds if skin temps are cold and grease is firm (not soft to touch).
 - If only cold water is used during all stages of prep, fast speeds might help to "chip" away heavy grease (Red Delicious protocol).
 - A neutral dump tank, heavy soap and rinse and a slower speed on wax brushes can improve fruit finish.

Generic Cosmic Crisp® Waxing Protocol (Continued)

- Type of soap: most soaps (alkaline, neutral, slightly acid) can be effective. Real Clean, Acidex Duo (in a neutral dump tank if calcium residues are an issue), and Cosmic Clean work well. You need to experiment what works for your conditions. Apply all soap at maximum pump speed (1 gal./hr. pump).
 - Examples: alkaline soap applied at a pH 9-12; dual application: slightly acid (pH 5.0) or neutral soap; acid soap alone can work also.
- Number of soap applications: Any single soap or dual application is better than none.
- Rinse: Make certain to rinse apples completely to fully remove any soap residue. A heated rinse water can help to remove the soap (90-100°F).
- Rinse brushes: constant speed to rotate the fruit and enable the soap to completely rinse off.

Drying section:

- Make sure no soap carry-over is happening, or fruit will not get dry before the wax.
- Use slowest speed possible after soap section.
- Drying brushes: odd-even speeds (every other brush goes at the same speed, brushes next to each other run at different speeds, this creates a buffing action and enables the fruit to tumble).
- If brushes are getting natural wax build up, the cleaning failed. Fruit was pushed through the soap section too fast. Beater bars: (angled iron bars underneath brush bed used to wick the moisture off the brushes). Move these bars 1/8 to max. ¼ inch into the brushes to wick the moisture off the brushes. Make sure the beater bars are engaged and working. Be aware, it wears those brushes out.

Waxing:

ATTENTION: when fruit reaches this point it needs to be completely dry. Check fruit for remaining moisture in the stem bowl or calyx. Run at normal speeds determined by fruit on the line.

Do not allow the brushes to dry, as this will lead to inferior waxing results (i.e., blotchiness, no wax, poor coverage). If the wax bed is drying out it may be hit with too much air from the dryers. Shield the section to slow down the warm air. Make sure wax brushes are not worn out, old brushes will not hold wax well. For best results during prolonged breaks (line break down, lunch), consider clearing the wax brushes. Apply wax before the line starts back up to get the brushes re-wetted.

Selection of wax: Each line is different. You need to test your waxes to determine which product gives you the best results in terms of shine, longevity, and taste of fruit. Work with your provider to select the best wax type to optimize the application results on your specific line. Ensure the fruit does not develop off flavor from the wax application. Carnauba based wax typically works well on fruit that is not greasy but may have a difficult time covering over excessive natural wax without pullback, and splotches. Shellac based coatings can cause whitening**, and off flavor, while preventing bleed-through from the natural wax coat. **Discuss the propensity to whiten in some markets before use.

Slice-Grade Quality Standards

Cosmic Crisp®

- Minimum pressure 15 lbs
- Not more than 10% pressuring below 15 lbs.
- Acceptable sizes 64 through 138



GRADE STANDARDS – US#1 grade or higher

HARVEST AGE - All Cosmic Crisp® for Crunch Pak slicing must be from 3rd leaf trees or older.

SIZE - Sizes are based on a 40 lb. box and can be grouped as follows:

64/72, 80/88, 100/113, 125/138. Any variance must be preapproved by Crunch Pak®.

COLOR - 20% minimum red color on bi-colored apples. Apples with no color and/or green background are unacceptable.

BRIX - 12.0 minimum

TEMPERATURES - Core temperature between 34-38 degrees Fahrenheit at receiving at Crunch Pak.

DEFECTS - Surface marks and defects such as limb rub, surface bruises, healed punctures, hail damage, insect damage (not codling moth), and scald, need to be able to be covered by two fingers placed longitudinally.

Sunburn is acceptable with two fingers, if it blends with surrounding color.

Stem splits are acceptable if confined to the stem bowl and less than 1/8th inch in width.

Stem bowl russet must be smooth and not visible if you place the apple stem-side down on a flat surface. Surface russet and fleck russet must be smooth and not more than 20% of the aggregate surface of the apple. Coarse or rough russet must be able to be covered by two fingers placed longitudinally.

SHAPE - Measured from either end of the apple, 20 degrees drop shoulder, 5% max, 10 degrees drop shoulder, 10% max.

MUST BE FREE OF- Stickers, injury bruising, bitter pit, lenticel breakdown, CO2 damage, internal browning, decay, open punctures, watercore, dehydration, codling moth, and worm damage.

RODENT DAMAGE/CONTAMINATION – All loads must be free of rodent damage/contamination and live worms. Loads showing signs of contamination will be rejected and hauled back right away. We can not put contaminated fruit in our storage.

BINS - Organic bins must be PLASTIC or dedicated/marked wooden bins. Wooden and/or plastic bins are acceptable for conventional fruit. All bins must be clean of debris and foreign material to include mold or any growth. All bins must have all runners, and must be in good, sturdy condition to safely allow high stacking in storage. Bins must be tagged with shipper name, variety, pack date and size.

CERTIFICATES - All suppliers must be in compliance with Crunch Pak's Approved Supplier Program. Certified scale-weight tickets are required for all deliveries.



Fruit Procurement and Grower Services
 Raw Fruit Specification Summary
 Comparison: Std 1, Std 2, and Juice Peeler

Category	Measurement	Standard 1 Peeler		Standard 2 Peeler		Juice Peeler		Testing requirements
		MIN	MAX	MIN	MAX	MIN	MAX	
Brix	Degrees	10	25	10	25	10	25	Use brix meter to test juice from 5 apples
Size	Inches	2.75	3.75	2.5	3.75	2.5	3.75	Use size cards for go/no-go
	Outside range	10%		10%		30%		Visual from top of bins (approx. 225 apples/bin)
Pressure	Minimum Low	11		10		9		2 punches on opposite sides of each apple tested: Minimum 15 apples/load
	Max % Below min.	10%		10%		10%		
Drop Shoulder	% > 15 degree	4%		16%		24%		Visual from top of bins (approx. 225 apples/bin)
Sticker	Max % allowable	1%		1%		10%		Visual from top of bins (approx. 225 apples/bin)
Decay	Max % < 1"	2%		3%		5%		Visual from top of bin (approx. 225 apples)
	Max % > 1"	1%		3%		5%		
Core Rot	Max % allowable	4%		4%		4%		Visual examination after slicing open 25 apples
Internal Browning	Max % Mild	4%		6%		12%		Visual examination after slicing open 25 apples*
	Max % Moderate	4%		4%		8%		
	Max % Severe	0%		0%		0%		
Watercore	Max % Mild	4%		100%		100%		Visual examination after slicing open 25 apples*
	Max % Moderate	0%		12%		12%		
	Max % Severe	0%		4%		4%		
Stem Bowl Cracks	% < 1/2" from center	12%		12%		12%		% - Visual from top of bin (approx. 250 apples), length - by measuring 25 affected apples*
	% > 1/2" from center	0%		4%		8%		
Bruising	Max > 1" area or 1/4" deep	6%		7%		9%		Area - visual from top of bin (approx. 250 apples), depth - by hand peeling 25 affected apples
Bitter Pit	% < 1/8" deep	0%		100%		100%		% - Visual from top of bin (approx. 250 apples), depth - by hand peeling 10 affected apples
	% > 1/8" deep	0%		20%		20%		
Hail Damage	% < 1/8" deep	0%		100%		100%		% - Visual from top of bin (approx. 250 apples), depth - by hand peeling 10 affected apples
	% > 1/8" deep	0%		20%		20%		

*Total defect percentage cannot exceed maximum of least severity (ex. SP2, I.B. - 3% mild + 3% moderate = 6% total exceeding the max of 4% mild)

NOTE 1: When evaluating lots, for any defect nearing maximum allowance should result in additional sampling to confirm initial findings




NOTE 2: Lots that are at the maximum defect percentage for 3 or more categories must be discussed to determine blendability with existing inventory

Reporting Your Production Schedule

Quality Assurance site visits and spot checks for compliance with the Marketing and Quality Standards will be performed by PVM representatives throughout the packing season.

All facilities are required to keep the PVM Quality Standards team apprised of their Cosmic Crisp® production schedule via the Idyia™ database system.

How to report your production schedule:

- Go to the Idyia™ Database System: <https://db.provarmanagement.com/>
- Sign in using your User ID and password.
NOTE: If you need a user ID, contact Jill Burbery at PVM: jill@provarmanagement.com
- From the Packer Menu, select: Edit Packing Calendar
- To add a new packing schedule:
Click the green  next to the date of your pack run.
Proceed to enter the Variety, Packing Location, Crop Year, Date and Time of the pack run.
Click **SAVE**
- Existing schedules will appear inside the date box on the screen.
- To edit an existing schedule:
Click the Pencil Icon next to the entry. 
A window will open and changes can be made to the line, date, and time.
Click **SAVE**
- To delete an existing entry:
Click on the pencil icon next to the entry. 
A window will open displaying your run details.
Click **REMOVE**

Note: When you create names for your packing lines or locations, please be descriptive, so someone from outside of your organization can find it. Example: Baker Flat Facility/ A Line

The Production Team at your facility will be sent email reminders of upcoming packing sessions. You are asked to keep your schedule current and update them if your schedule changes.

Site Visits and Inspection Reports

All site visits made by the PVM Quality Team are documented in the Idyia™ system.

We collect data about the production run including:

- The Grower Lot (which is tied to a tree license or licenses)
- Harvest and storage information for the lot
(This is key! Please assist by making this information available to the inspector)
- The products and methods used to wash and wax the fruit
- Maturity data
- Grade and package information
- Comments
- Photos

Can I see these reports?

If you have a question, or notice an error on your report, please contact Doug Carey 509-731-6280. Production Facilities are encouraged to review the Inspection Reports in the module View Packing Inspections. Remove the date at the top of the page to see a list of all reports for your facility.

What does PVM do with this data?

The data we collect is shared with our partners at WSU Tree Fruit Research and Washington Tree Fruit Research Commission to broaden our knowledge and improve the handling practices for Cosmic Crisp®.

Quality Standards Non-compliance Policy

Step 1

PVM is made aware of information suggesting packed product does not meet the grade & quality standards established for use of the trademark. The information may be observed during a routine site visit or retail check, or it may be received in the form of a complaint from a retailer, consumer or another industry member.

If the information is the result of a complaint

PVM will initiate a dialogue with the packer and sales agency to fairly and fully investigate the allegation, and understand the full nature, scope and potential causes of the fruit condition.

- If the concern is found to be unsubstantiated, or appears to be an isolated incident with no risk of recurrence, we will simply document our findings, including the apparent reason the fruit identified was out of specification
- If the concern is determined to be valid, a site audit may be conducted to examine packed fruit in inventory and/or attend a production run of Cosmic Crisp® WA 38 cv. A report of the findings will be generated, detailing the results of the audit inspection and any solutions. The report will be shared with the packer and the associated Sales Company and will be placed on file at PVM.

If product fails to meet grade standards as a result of a PVM site visit or retail check:

- PVM personnel will work with staff at the production facility to help bring the operation into compliance with the standards established for use of the trademark, Cosmic Crisp®. This will be completed through illustration, education, and training, with a goal of mutually arriving at a product that conforms to the grade standard. PVM will make every effort to be supportive in reaching this goal.

Step 2

If continued evidence of non-compliance is found, or the production facility is uncooperative about making changes and improvements needed to meet the industry-accepted quality standards, PVM has the right to take disciplinary action. These actions can include the following steps, depending upon the severity of the situation:

- A. A written warning of non-compliance may be issued to the facility and placed on file at PVM.
- B. The Packing License or Sales Desk License may be suspended for a specified period of time. This suspension will be communicated with the trademark owner and the industry.

Quality Standards

Non-compliance Policy (continued)

Step 3

In the event of an obvious disregard or lack of genuine cooperation to follow the trademark specifications for the brand despite all efforts by PVM to educate, instruct and support the facility, the license(s) will be terminated for non-compliance of the terms of the agreement. This action will be shared with the stakeholders, including the trademark owner and industry.

In Conclusion

There is an expectation by the Industry, the Brand Owner (WSU) and PVM that all licensees will make a good faith effort to meet the brand goals. As the administrator of the Quality Standards Program, PVM staff will engage in methods of education and training, making every effort to bring any issue to a positive resolution for the success of the trademark and the industry. Although the cultivar and its accompanying brand, Cosmic Crisp®, is owned by Washington State University, the reputation and long-term success lies squarely in the hands of the Washington Apple Industry. The number one goal of the Quality Standards Program is to ensure that all packers are following the marketing and quality standards developed by the Quality Standards Committee and the grade standards for apples marketed within the State of Washington as placed into law by the legislature.



WITH APPRECIATION TO WASHINGTON STATE UNIVERSITY AND
THE WASHINGTON TREE FRUIT RESEARCH COMMISSION



WASHINGTON STATE
UNIVERSITY

