

Grading 101

Hawaii Coffee Association Conference

Lihue, Kauai

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Robert Coffey

Hawaii Department of Agriculture

Commodities Branch - Maui

Learning Objectives:

- Familiarity with Grading & Certification
- Understanding Hawaii Coffee Standards
- Basic I.D. of defects; causes & remedies
- Using best practices to improve cup quality

The background of the slide is a solid, warm brown color. Overlaid on this background are several faint, stylized outlines of autumn leaves in various shades of brown and tan. The leaves are scattered across the frame, with some showing prominent veins. The overall aesthetic is clean and seasonal.

What is grading?

What is grading?

Grading:

A device for controlling the quality of an agricultural commodity so that the buyer & seller can do business without personally examining every lot sold.

Kenneth Davids

Examples of graded products

Beef: USDA Prime, USDA Choice, etc.

Eggs: USDA AA, USDA A, USDA B

FFV: U.S. XF, U.S. Fancy, U.S. No.1, etc.

Coffee:

Kenya AA

Colombia Supremo, Excelso

Hawaii Extra Fancy HI No. 3

SCAA Specialty Grade, Premium Grade

Hawaii Coffee Grades

- Grade statement is based on Hawaii coffee standards which are based on:
 - Size (High grades)
 - Moisture (9.0 to 12.2%)
 - Defects
 - Roast/Cup (for defects only, not character)

Hawaii Coffee Standards

TABLE 1
Summary of Chapter 4-143 (effective October 8, 2001)
Hawaii Administrative Rules - STANDARDS for COFFEE
(for the complete standards, visit the Dept's website at: <http://www.hawaiiag.org/hdoa/adminrules.htm>)

CHARACTERISTIC	HAWAII EXTRA FANCY KAUAI EXTRA FANCY KONA EXTRA FANCY MAUI EXTRA FANCY MOLOKAI EXTRA FANCY	HAWAII FANCY KAUAI FANCY KONA FANCY MAUI FANCY MOLOKAI FANCY	HAWAII NO. 1 KAUAI NO. 1 KONA NO. 1 MAUI NO. 1 MOLOKAI NO. 1	HAWAII SELECT KAUAI SELECT KONA SELECT MAUI SELECT MOLOKAI SELECT	HAWAII PRIME KAUAI PRIME KONA PRIME MAUI PRIME MOLOKAI PRIME	HAWAII NO. 3 ⁽²⁾
CLEANLINESS	Clean	Clean	Clean	Clean	Clean	Clean
COLOR	Uniformly good green	Uniformly good green	Uniformly good green	- - - -	- - - -	- - - -
ROASTING QUALITY	Good	Good	Good	- - - -	- - - -	- - - -
AROMA AND FLAVOR WHEN BREWED	Good	Good	Good	No undesirable aroma or flavor when brewed.	No undesirable aroma or flavor when brewed.	No undesirable aroma or flavor when brewed.
ALLOWANCE FOR DEFECTS ⁽³⁾	8 (full imperfections per 300 grams)	12 (full imperfections per 300 grams)	18 (full imperfections per 300 grams)	5 % (defective beans incl. not > 2% full sour, stinker, black, or moldy)	15 % (defective beans incl. not > 5% full sour, stinker, black, or moldy)	35 % (defective beans incl. not > 5% full sour, stinker, black, or moldy)
	Based on count			Based on weight		
SIZE MINIMUM (tolerance for undersize - 10% by wt.)	Type I - Size 19 Type II - Size 13	Type I - Size 18 Type II - Size 12	Type I - Size 16 Type II - Size 10	Optional (May be specified)	Optional (May be specified)	- - - -
MOISTURE (by wt.) (+ or - 0.3%age points)	9 to 12.2 %	9 to 12.2 %	9 to 12.2%	9 to 12.2%	9 to 12.2 %	9 to 12.2 %
TYPE/OTHER TYPE BEANS PERMITTED (by wt.)	One type; not > 3% other type beans	One type; not > 3% other type beans	One type; not > 3% other type beans	- - - - (If sz. specified, not > 3%)	- - - - (If sz. specified, not > 3%)	- - - -
<p>OFFGRADE = quality lower than Hawaii No. 3. Use of the term "Hawaii" in conjunction with the term Offgrade is prohibited.</p> <p>⁽²⁾ Use of the term "Hamakua", "Kau", "Kauai", "Kona", "Maui", "Molokai", or "Oahu" in conjunction with the term "No. 3" or "Off Grade" is prohibited.</p> <p>⁽³⁾ Defects are scored as either full imperfections or less than full imperfections. Less than full imperfections are scored as one-fifth of a full imperfection.</p> <p>Minimum export requirement: Off grade green bean coffee may be exported provided that all containers are printed in bold letters of not less than one and one-half inches in height "OFF GRADE COFFEE". All invoices for this product must also be marked in large bold capital letters "OFF GRADE COFFEE".</p>						

Type I vs. Type II

- Type I is flat bean
- Type II is Peaberry
- Peaberry IS NOT A GRADE

PEABERRY (Not a defect)

- Occurs when one of the ovules does not develop; the other one occupies the whole berry, forming a round bean
- Not more than 3% by weight allowed in higher grades
- Classified as a type of bean (Type II)
- No.1 is most common grade (PB size 10)

Green bean is a combination of:

- Fats
- Proteins
- Fiber
- Miscellaneous chemicals

Coffee Essence, Coffee Oil, Coffeol

- Makes up only 1/200th of bean weight
 - Dissolves in water
 - Evaporates easily
 - Readily absorbs other (less desirable) flavors
 - Is as fragile as it is tasty
-
- Without it, there is no coffee.... Only sour brown water and caffeine

GREEN DEFECTS AND HOW TO PREVENT THEM

Virginia Easton Smith

Cooperative Extension Service

University of Hawaii at Manoa

Richard Dinker

Hawaii Department of Agriculture

FACTORS AFFECTING QUALITY

- **Site-rainfall, soil, elevation, shade/sun**
- **Variety**
- **Nutrition**
- **Pests and Disease**
- **Harvest**
- **Processing**

SITE

- **Rainfall**-ideal in Hawaii is 60-85” a year, well distributed as relates to growth phase: vegetative, flower, fruit
- **Soil**-good drainage, fertile
- **Elevation**-as relates to temperature
- **Shade/sun**-temperature, production higher in sun but more stress on tree

VARIETY

Guatemalan or Kona typica is best for
Kona conditions



NUTRITION

- UH CTAHR recommends 1,600-2,000 lb/year of fertilizer such as 15-5-25 based on research done in Kona
- Soil and leaf analysis should be done to make recommendations specific to individual farms

PESTS AND DISEASE



Green
Scale

PESTS AND DISEASE



Coffee Twig Borer



PESTS AND DISEASE

Kona Coffee Rootknot Nematode



Infected roots

Healthy roots

A healthy root system has many fine, white feeder roots.



PESTS AND DISEASE



HARVEST

- Harvest only ripe cherries, not under- or over-ripe



PROCESSING

- Pulp within 24 hours of picking
- Make sure equipment is adjusted properly
- Ferment correctly
- Dry parchment properly



BASIC CATEGORIES OF DEFECTS

- **Botanical/Environmental**
- **Harvesting/Processing**

BOTANICAL/ENVIRONMENTAL

- **Quaker**
- **Mother**
- **Shell**
- **Insect**

QUAKER/FLOATER - underdeveloped



PREVENTING QUAKERS/ FLOATERS

- Provide adequate water and nutrition
 - Water is critical in the 6 to 16 weeks after flowering when bean size is determined
 - Adequate nutrition and water are critical in bean density especially during 20-30 weeks following flowering

MOTHER/ELEPHANT - two beans develop in one ovule (botanic deviation)



SHELL-one half of a mother bean



INSECT-holes and mines



Insect- CBB damage



PREVENTING INSECT DAMAGE

- Insects are more attracted to stressed trees
- Keep trees as healthy as possible by providing adequate water and nutrients
- Follow best management practices for CBB
- Store parchment or green in a protected area

HARVESTING/PROCESSING

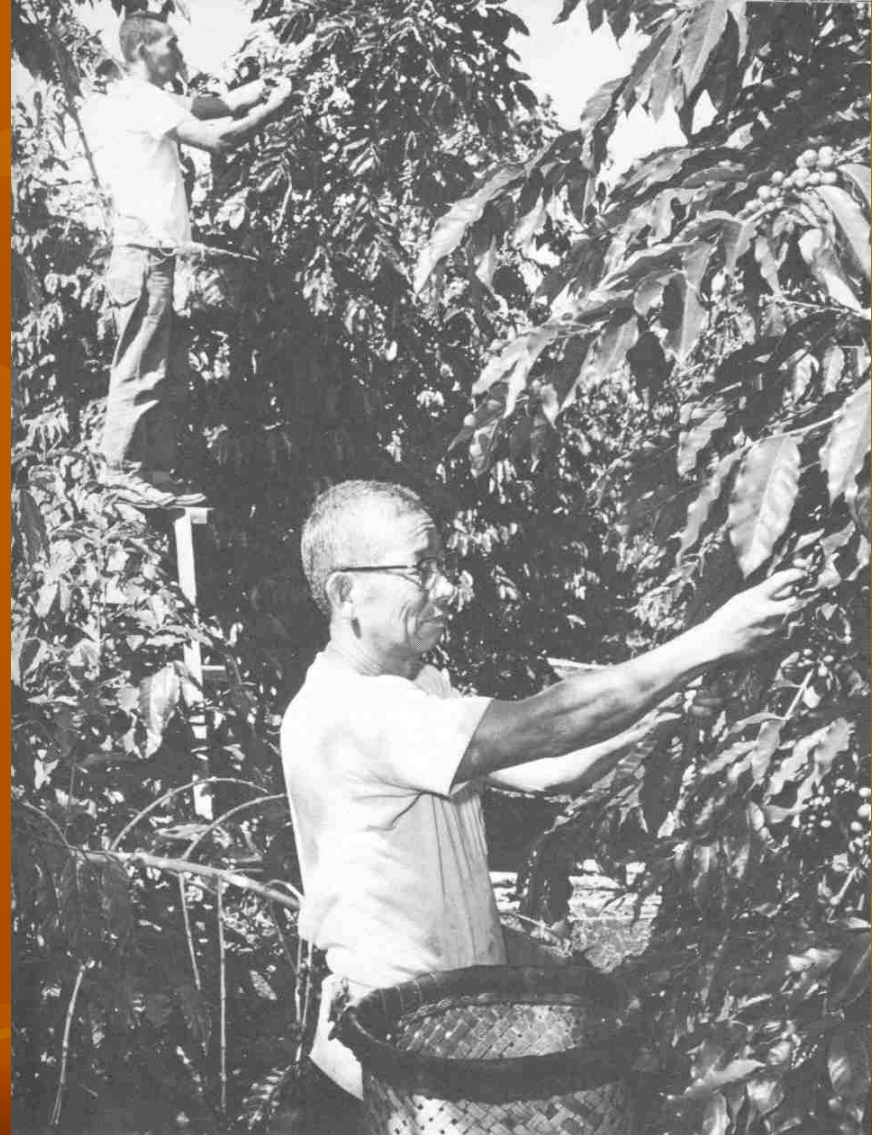
- **Black**
- **Mold**
- **Sour/Stinker**
- **Broken, Cut, Nicks, Chips**
- **Aged/Discolored**

BLACK



PREVENTING BLACK

- Do not process raisins
Do not pick raisins



MOLD



PREVENTING MOLD

- Dry parchment to 11.5-12.5% moisture, so the green is approximately 10-11%
- If sun drying use proper thickness and turn frequently during the day
- Moderate temperature and moisture storage environment
- Provide adequate ventilation

POSSIBLE CAUSE OF MOLD- *Cercospora* berry blotch



Control fungal diseases with cultural practices

SOUR/STINKER - fermented odor or flavor



PREVENTING SOUR/STINKER

- Don't pick over-ripe cherries
- Pulp within 24 hours of picking
- Don't over-ferment; ferment only until bean has lost slippery feeling
- Avoid storing near strong odors

BROKEN, CUT, NICKS, CHIPS



PREVENTING BROKEN, CUT, NICKS, CHIPS

- Have pulper properly adjusted
- Have huller properly adjusted
- Don't over-dry coffee (to prevent brittleness)

AGED/DISCOLORED



PREVENTING AGED/ DISCOLORED

- Moderate temperature and moisture storage environment
- Prevent uneven drying of coffee by turning frequently
- Store at proper percent moisture of coffee
- Store as parchment if possible
- Don't store for too long a period

KONA EXTRA FANCY



KONA FANCY



KONA NO. 1



KONA NO. 1 (PB)



KONA SELECT



KONA PRIME



HAWAII NO. 3



OFFGRADE



Certification:

- Confirmation that some fact or statement is true through the use of documentary evidence.

Hawaii Dept. of Agriculture

- Will issue a certificate based on the actual grade determined by sampling and grading.
- For lots of 10 bags or less, 100% sampled
- For lots > 10 bags, 30% minimum sampled

Buying Certified Coffee

- Copy of certificate (from seller)
- Stamped bag tags
- Compare certificate with tag (Lot # and grade)

Hawaii Coffee Standards

- Created in the 1960' s
- Revised slightly in 1981 and 2001
- In 2001 added SELECT grade to fill gap between NO. 1 and PRIME

Coffee Grading Worksheet

Hawaii Dept. of Agriculture Quality Assurance Division Commodities Branch	CERTIFICATE OF SAMPLING AND GRADING WORKSHEET GREEN COFFEE BEANS	C-2b 1/0/01
Applicant:	_____sacks @ _____ lbs. ea.	Date: _____
Address:	_____	Lbl. Grade: _____
Sampled at:	Total Lot Size: _____ lbs.	Lot No.: _____
Principal Marks on Containers (sacks):		Receiver: _____
Principal Label Marks:		Address: _____
Remarks:		Time Spent: _____
		Mileage: _____
		<input type="checkbox"/> Cert. of Origin attached
<i>I certify pursuant to Chapter 147, Part I, Hawaii Revised Statutes and Chapter 143 of Title 4, Hawaii Administrative Rules, that I have this day drawn samples believed by me to be representative of the lot described above:</i>		

GRADING WORKSHEET			
Sample Size: _____ grams	OTHER TYPE BEANS:	Grams	%
GENERAL CHARACTERISTICS		DEFECTS	
CLEANNESS	ROASTING	DEFACTS (* = full imperfection)	COUNT
COLOR	AROMA AND FLAVOR (cupping)	WEIGHT (GRAMS)	%
MOISTURE		Black *	
		Partly Black	
		Moldy *	
		Partly Moldy	
		Sour *	
		Partly Sour	
		Stinker *	
		Partly Stinker	
		Pod Full / Partial	
		Husk Full / Partial	
		Hull Full / Partial	
		Stone (>4mm Full) / Partial	
		Stick (>4-10 Full) / Partial	
		Stick >10mm 2x Full	
		Quaker	
		Shell	
		Moth	
		Insect damage	
		Broken or cut	
		Other: Aged / Discolored	
		Other: _____	
		TOTAL	

BEAN SIZE					
TYPE ONE			TYPE TWO (peaberry)		
Size	Grams	%	Size	Grams	%
20+					
19+			14+		
18+			13+		
18-			12+		
17+			10+		
16+			10-		
16-					
TOTAL					
undersize					

Remarks: _____

Grade of Lot: _____

Certificate No.: _____ Date: _____

Grader: _____

On farm grading program

- Moisture meter
- Scale (grams)
- Table / desk with good lighting
- Tools: needle nose pliers, pocket knife
- Sizing screens
- Access to roasting and cupping

Benefits of grading your coffee:

- Clues to health of trees
- Identify bean quality issues and take corrective actions
- Improved cup quality
- Provide buyers with expectation of quality
- Increase sales???

Resources for graders

- SCAA Green Defect Handbook and posters
- SCAA web site has SOP' s and specs
- Trade publications and texts
- CTAHR Extension
- www.hawaii.gov/hdoa/qad/comm/comm
- HCA
- Local coffee associations
- HDOA branch offices (by appt.)

SCAA Defect Handbook

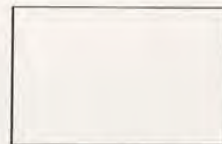
FULL BLACK/PARTIAL BLACK

Defect Name:	Full Black
Other Names:	Black or partial black
Spanish Name:	Grano Negro - parcial negro
SCAA Classification:	Full Black is a Primary defect: 1 predominantly black bean = 1 full defect Partial Black is a Secondary defect: Less than 1 black, 3 beans = 1 full defect
Effect on Cup Quality:	Varies. Ferment or stinker taste, dirty, moldy, sour, phenolic taste.
Other issues:	Ochratoxin risk
Cause(s):	Agricultural, Blackening, results from over fermented pigment associated with micro-organisms.
Remedies:	1) AGRICULTURAL. Black beans are prevented by picking only ripe fruit from the trees, and avoid over-fermentation conditions during farm processing. 2) PROCESSING. Black beans become apparent when the parchment (pergamino) is removed. They are usually slightly smaller and less dense and some of them can be removed by screening and by density sorting. The most effective way to remove them is manually (hand sorting) or mechanically using a color sorting machine.

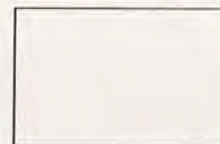
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FULL BLACK



YOUR SAMPLE
1 Bean = 1 Defect



YOUR SAMPLE
3 Beans = 1 Defect



PARTIAL BLACK

Physical Description: Black beans are distinguished by their opaque color.

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QUALITY



Once coffee is harvested nothing can be done to *improve* its quality, but many things can be done to *harm* the quality.