



Characterization of the AFS main-crop quality for potential value addition to the farmers' incomes

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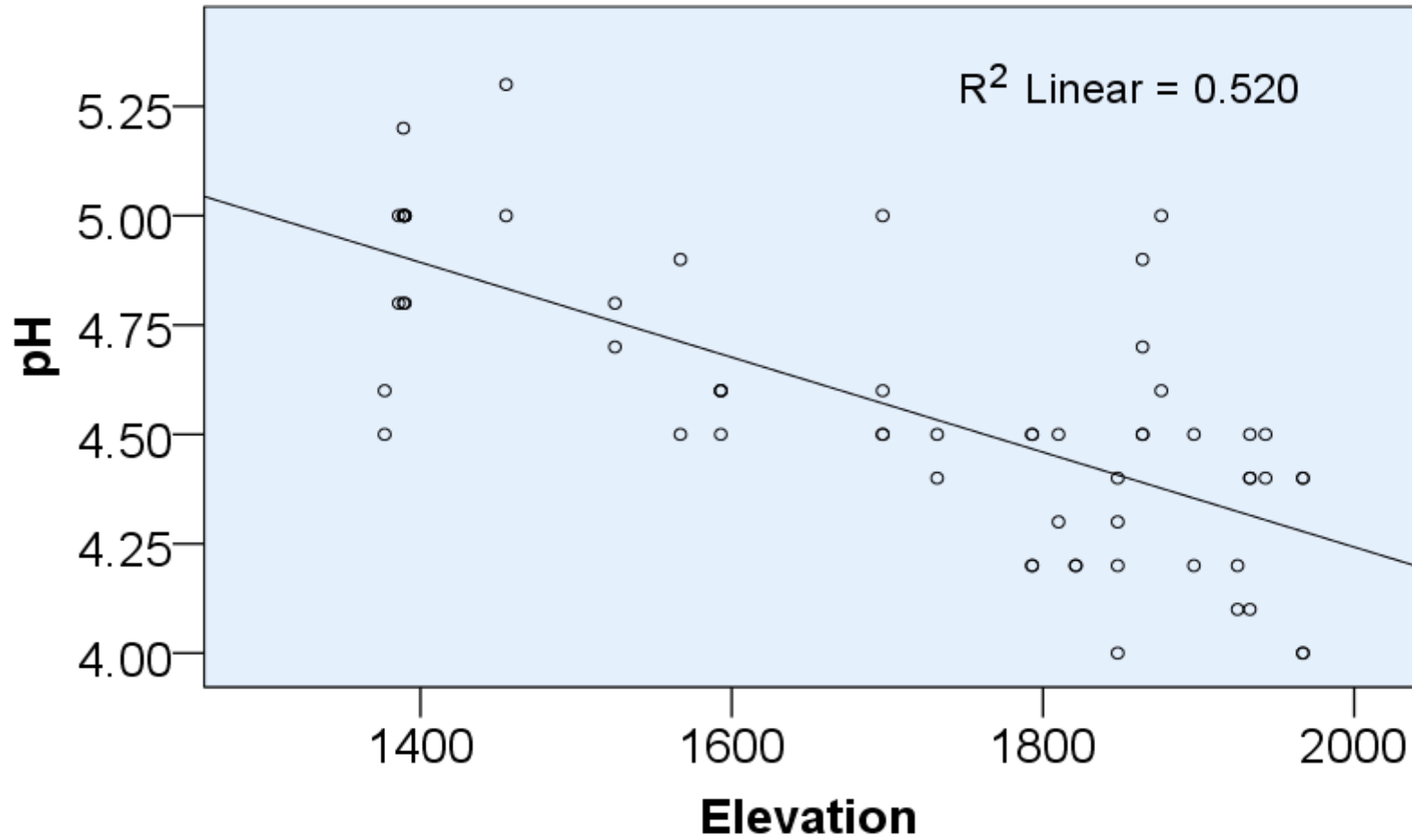
Site identification and selection of sampling sites

- 33 sites visited in Muranga County
- 32 Soil samples taken
- 64 soil samples analyzed and reported

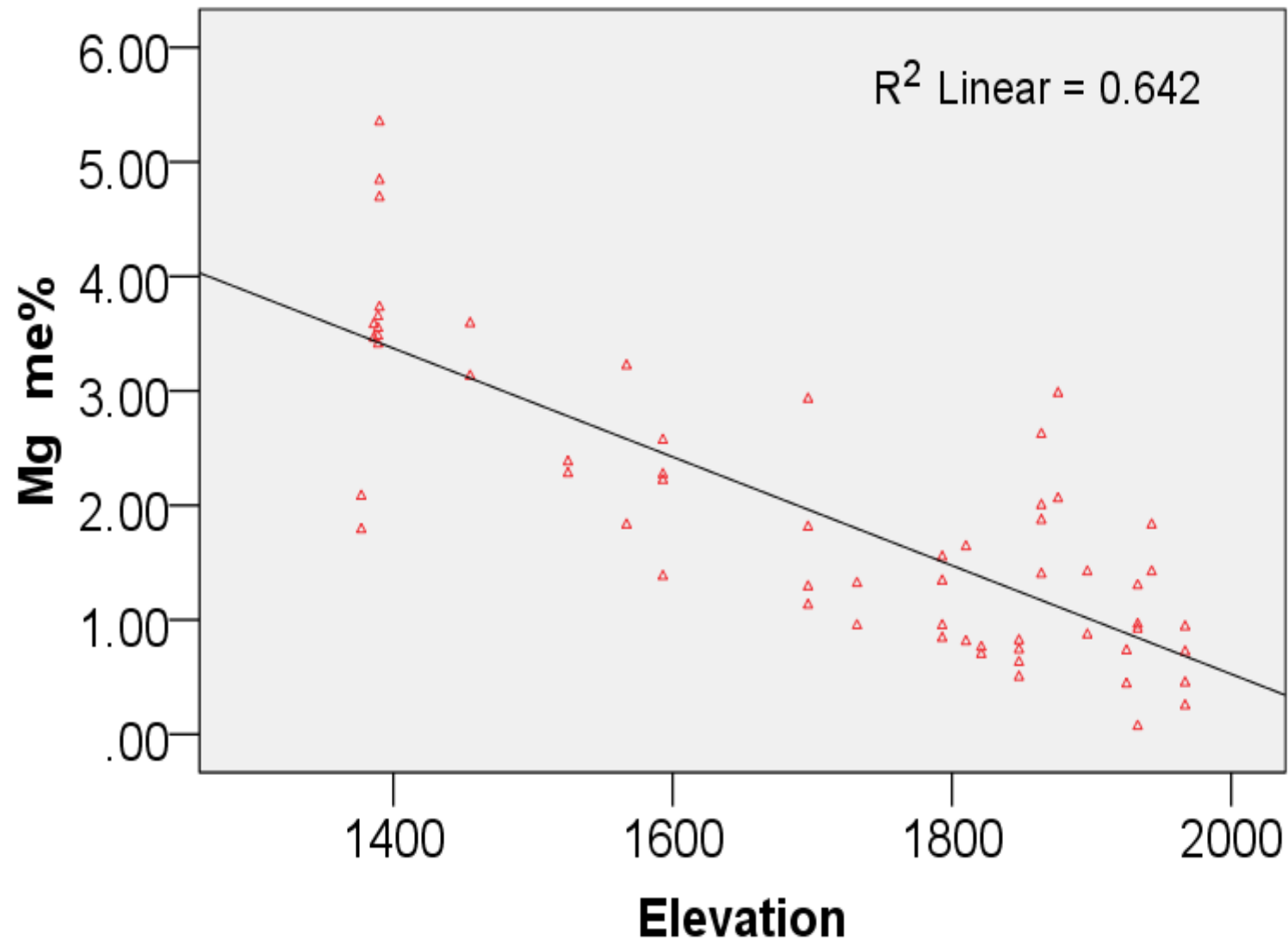
SUMMARY OF SOIL ANALYSIS DATA

- ❑ pH to decrease with elevation
- ❑ pH and magnesium levels were found to decrease with elevation
- ❑ To some extent higher levels of phosphorous were found at higher elevations
- ❑ 30% of the samples had adequate levels of phosphorous,
- ❑ Manganese was deficient in all the soil samples except two.
- ❑ 11% of the soil samples had adequate levels of sodium
- ❑ 47% had adequate levels of potassium
- ❑ 27% had adequate levels of calcium.

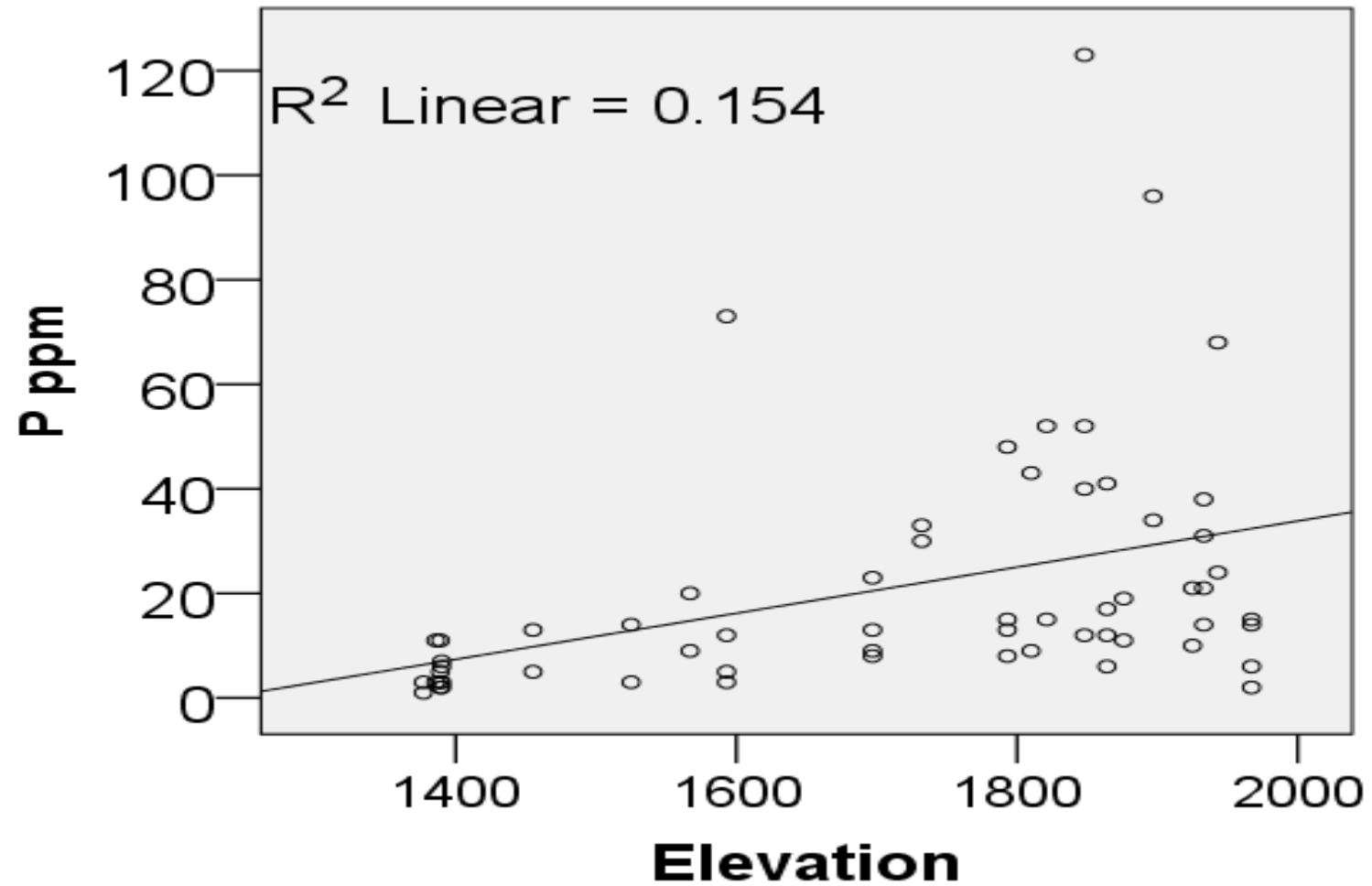
PH and elevation



Magnesium levels and elevation

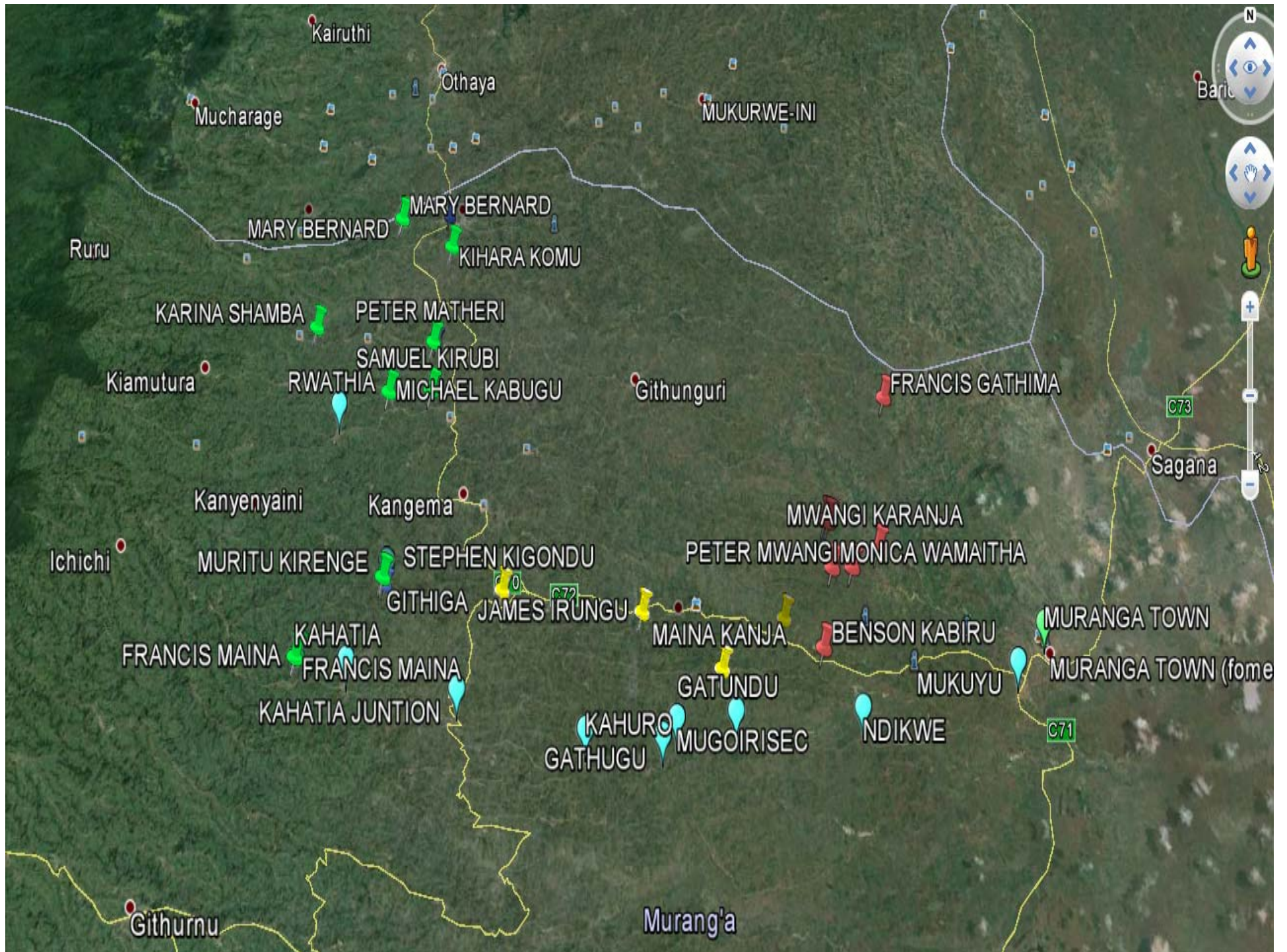


Phosphorous levels and and elevation



Factors considered in selecting sites for collecting cherry samples for quality analysis

- Elevation - 1377 to 1967
- Varieties - Traditional and Improved (disease resistant)
- Coffee under full sun or under some shade (shadow)



Big tree providing shade to coffee below



Trees along the hedge casting shade on coffee



UNIFORM PROCESSING PROCEDURES

- ⊕ **Harvesting**
- ⊕ **Pulping**
- ⊕ **Fermentation**
- ⊕ **Soaking and final washing**
- ⊕ **Parchment drying**
- ⊕ **Hulling**
- ⊕ **Grading**



Fermentation



SUN DRYING



Grade	General description	Screen aperture as per KS 174 or ISO 415-1980*
E	Elephant – (Retained on 21) Two beans joined together, it is a genetic defect. And includes very large (bold) AA	size diameter 8.3 mm
AA	Flat beans (through screen 21 retained on 18)	size diameter 7.2 mm
AB	Flat beans-(through screen 18 retained on 17)	Size diameter 6.35 mm
PB	Pea berries-(Retained on screen 12).One ovule develops instead of the usual two	Size diameter 4.76 mm
C	Smaller beans-(Retained on screen 10)	Size diameter 3.96 mm
TT	Light beans, from AA, AB and E grades	
T	Smallest, consists of broken and small C	Size diameter 2.9 mm

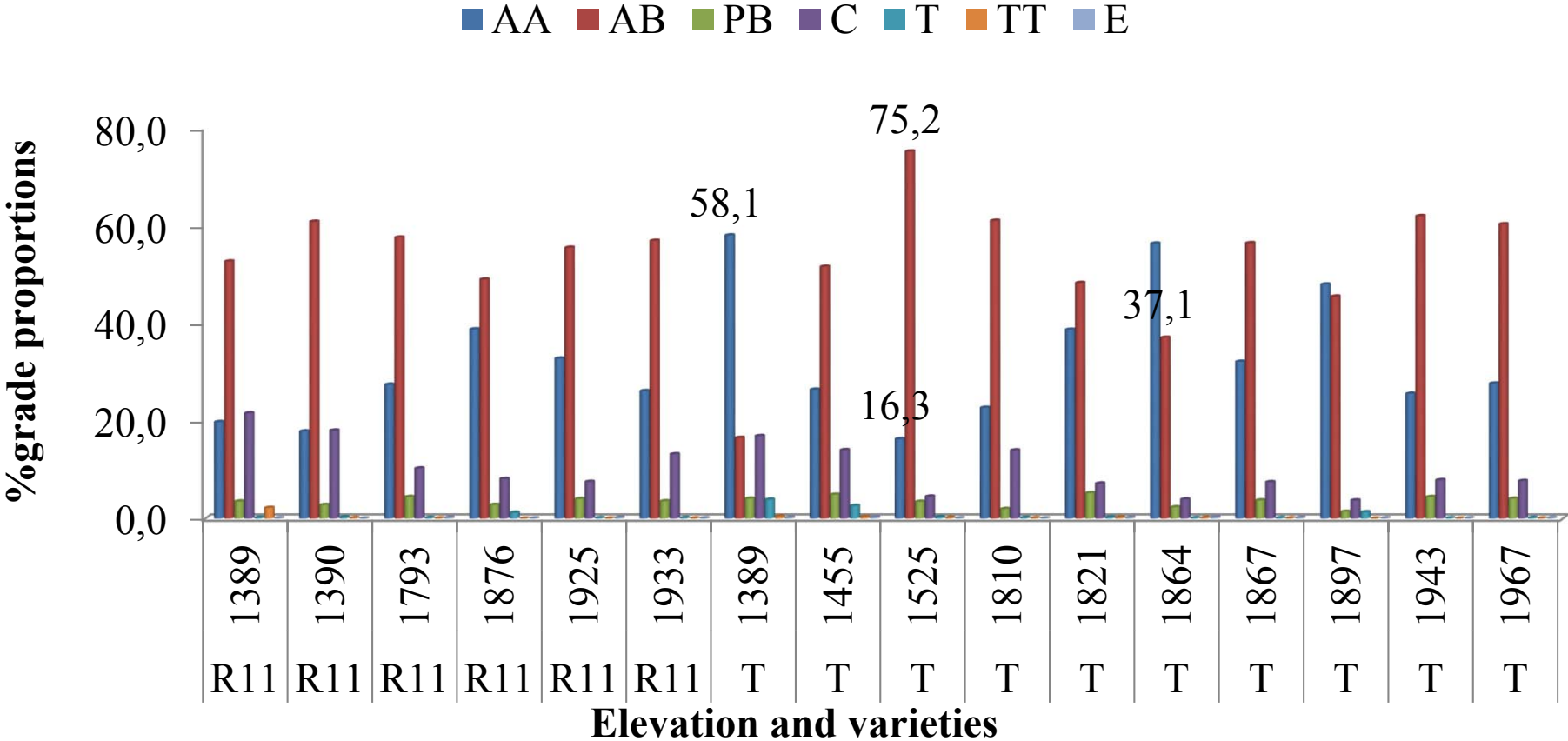
Sensory evaluation methodology

- ❑ Green coffee AB grade roasted to medium roast, weighed out as whole beans (five cups of each sample)
- ❑ Beans ground immediately prior to cupping,
- ❑ Clean and odor free water was used for coffee beverage preparation
- ❑ Gouund coffee allowed to steep undisturbed for 3-4 minutes before evaluation.
- ❑ Ten sensory attributes assessed for each coffee on a ten point scale: Fragrance/Aroma, Flavour, Aftertaste, Acidity, Body, Balance, Uniformity, Clean Cup, Sweetness and Overall perception.
- ❑ A panel of six judges used in this study was selected from a pool trained and certified by Coffee Board of Kenya and Coffee Quality Institute of America

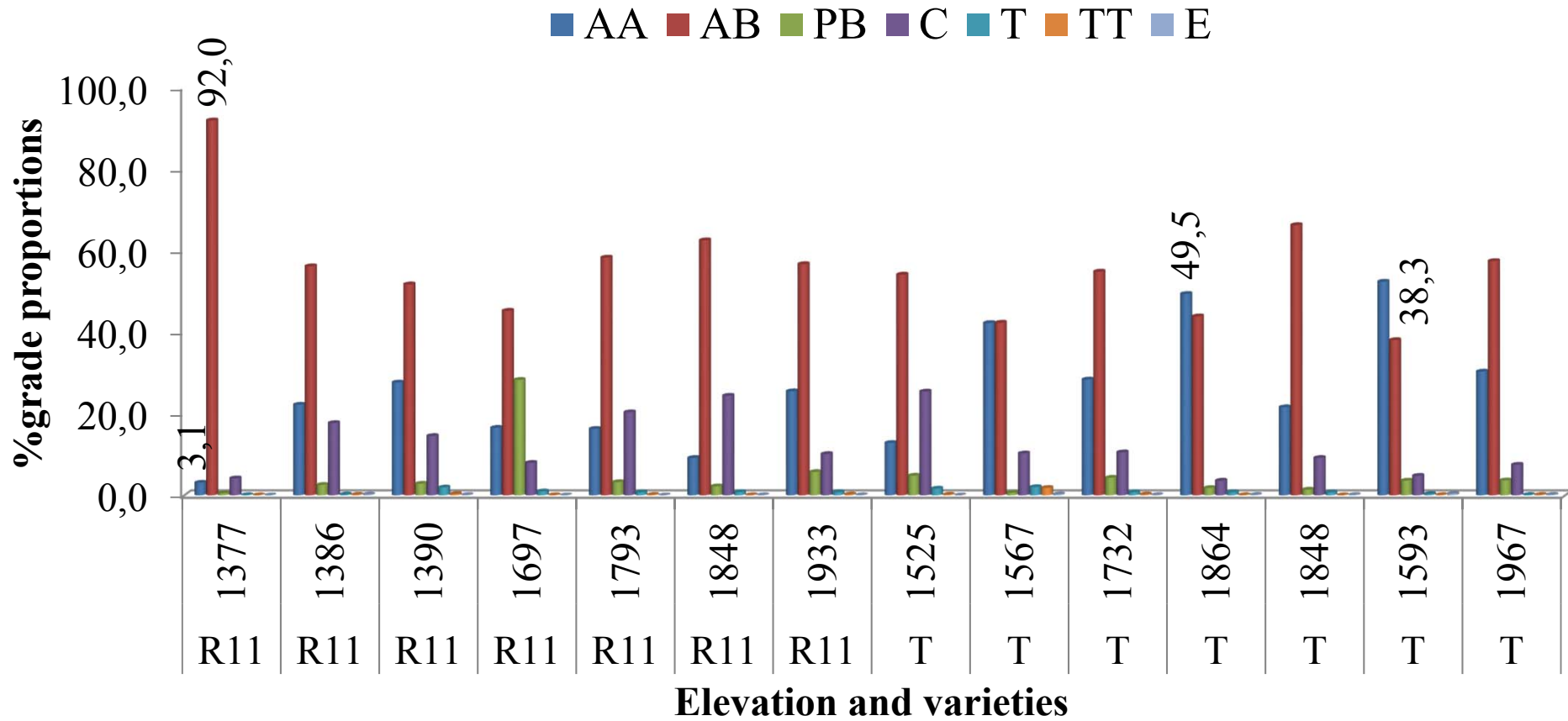
RESULTS

Grade categories	Proportions	
	Lowest	Highest
AA	3.14	58.05
AB	16.55	91.99
PB	0.53	28.62
C	3.65	25.77
T	0.07	3.89
TT	0.01	2.2
E	0.01	0.38

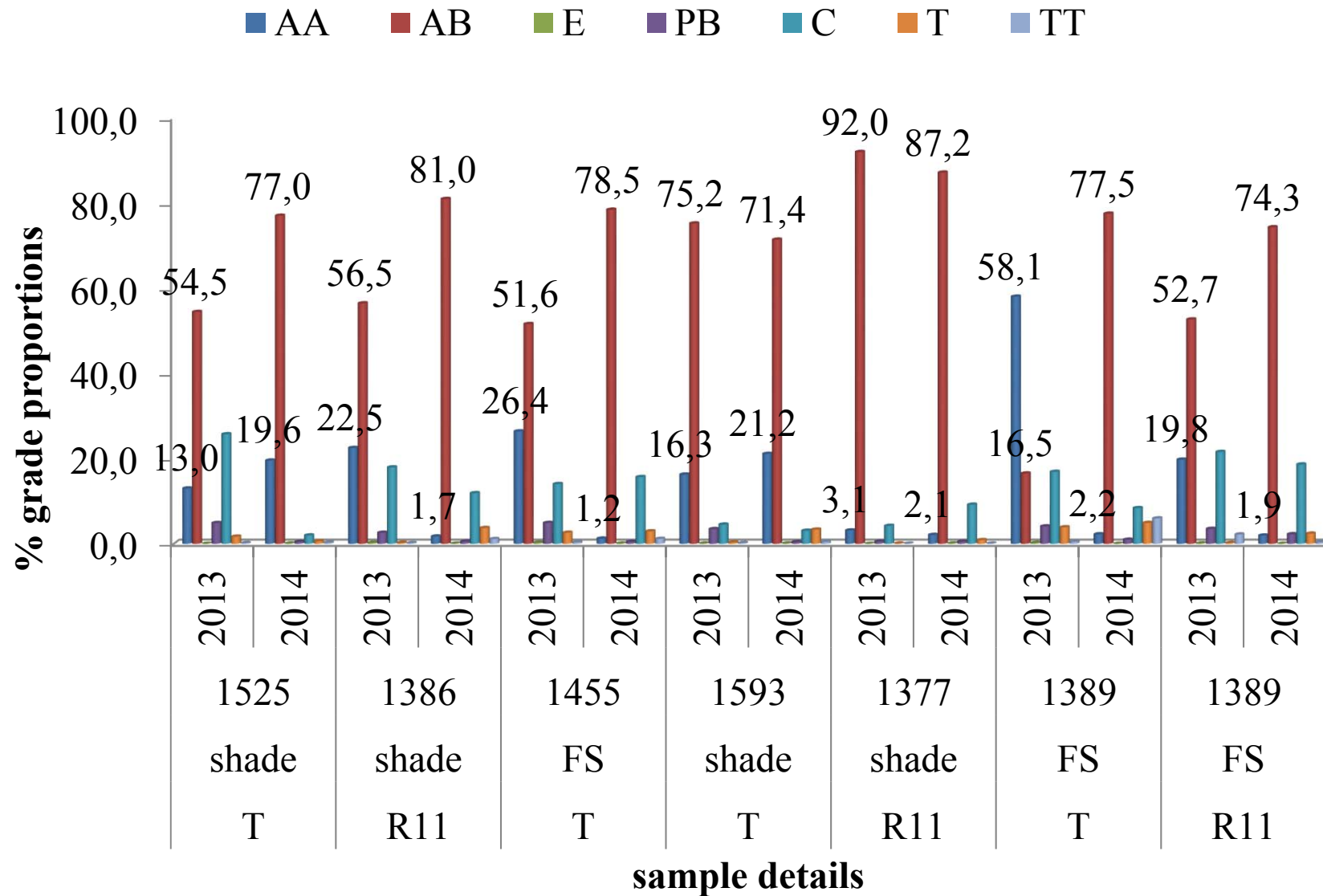
GRADE PROPORTIONS FROM COFFEE UNDER FULL SUN



GRADE PROPORTIONS FROM COFFEE UNDER SHADE



Comparison of grade proportions for two seasons



Sensory characteristics of coffee under full sun

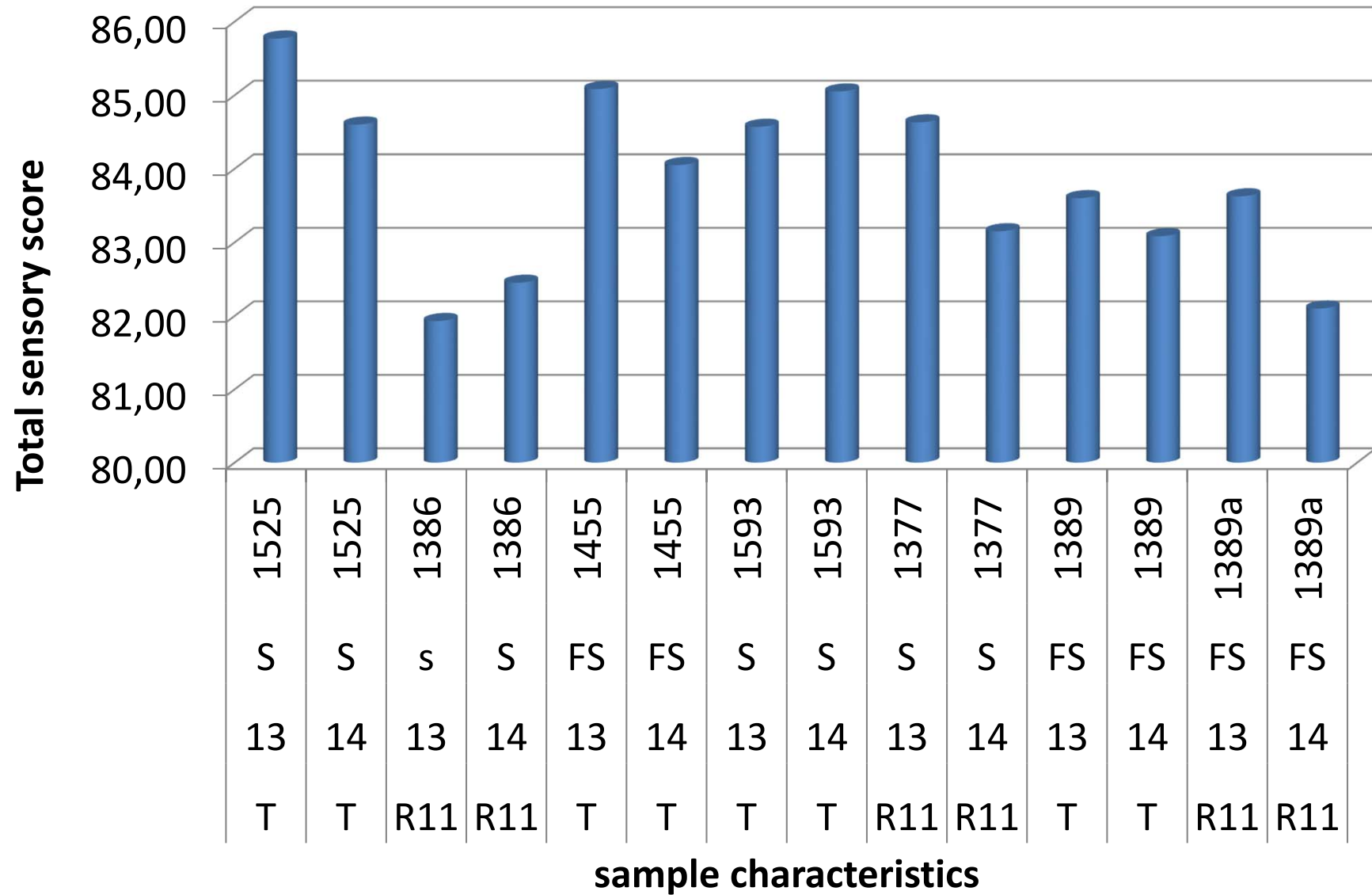
Variety	Altitude	Fragrance	Flavour	Aftertaste	Acidity	Body	Balance	Overall
T	1967	7.58ab	7.46ab	7.63a	7.54bc	7.58a	7.50abc	7.54bc
T	1943	7.71ab	7.54ab	7.71a	7.63abc	7.67a	7.67abc	7.71ab
T	1897	7.79a	7.71ab	7.79a	7.63abc	7.75a	7.75ab	7.79ab
T	1867	7.83a	7.67ab	7.71a	7.92abc	7.71a	7.71ab	7.83ab
T	1864	7.83a	7.71ab	7.92a	8.00ab	7.79a	7.83ab	7.92ab
T	1821	7.88a	7.79a	7.88a	8.04ab	7.75a	7.92a	7.88ab
T	1810	7.96a	7.88a	7.79a	7.96abc	7.71a	7.88a	8.08a
T	1525	7.75ab	7.83a	7.83a	7.96abc	7.71a	7.79ab	7.96ab
T	1455	7.96a	7.79a	7.88a	8.15a	7.71a	7.88a	7.83ab
T	1389	7.67ab	7.54ab	7.63a	7.58abc	7.54a	7.58abc	7.54bc
R11	1933	7.88a	7.88a	7.83a	8.00ab	7.75a	7.75ab	7.92ab
R11	1925	7.67ab	7.63ab	7.75a	7.75abc	7.67a	7.67abc	7.75ab
R11	1876	7.67ab	7.58ab	7.67a	7.83abc	7.63a	7.58abc	7.67ab
R11	1793	7.83a	7.83a	7.88a	8.04ab	7.83a	7.92a	7.88ab
R11	1390	7.38b	7.29b	7.25b	7.42c	7.42a	7.38c	7.29c
R11	1389	7.67ab	7.58ab	7.67a	7.71abc	7.71a	7.63abc	7.67ab

Means along a column not sharing a letter are significantly different

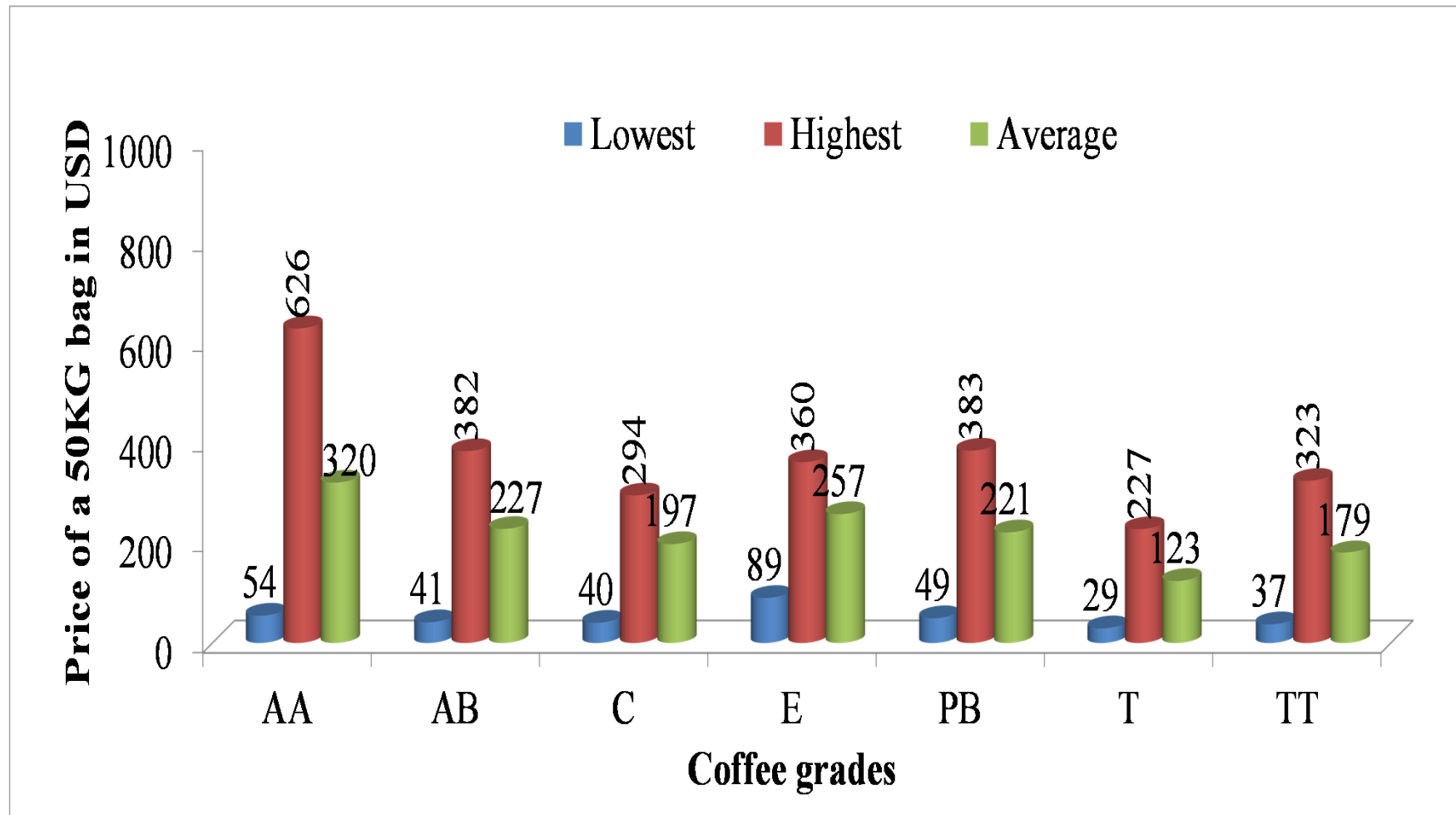
Sensory characteristics of coffee under shade

Variety	Altitude	Fragrance	Flavour	Aftertaste	Acidity	Body	Balance	Overall
R11	1933	7.63a	7.79a	7.75ab	7.83a	7.67a	7.67ab	7.75a
R11	1793	7.67a	7.63a	7.71ab	7.71ab	7.63a	7.67ab	7.67ab
R11	1377	7.83a	7.83a	7.67b	7.96a	7.67a	7.71ab	7.96a
R11	1848	7.75a	7.75a	7.71ab	7.75ab	7.67a	7.71ab	7.63ab
R11	1390	7.54a	7.54ab	7.63ab	7.67ab	7.54a	7.54ab	7.58ab
R11	1386	7.58a	7.33b	7.38b	7.38b	7.50a	7.38b	7.38b
R11	1697	7.71a	7.71a	7.79ab	7.96a	7.71a	7.88a	7.83a
T	1864	7.75a	7.75a	7.79ab	7.92a	7.71a	7.71ab	7.83a
T	1732	7.75a	7.79a	7.83a	7.96a	7.75a	7.88a	7.92a
T	1525	8.04a	7.88a	7.96a	8.13a	7.88a	7.92a	7.96a
T	1567	7.79a	7.79a	7.88a	7.96a	7.75a	7.75ab	7.92a
T	1848	7.88a	7.71a	7.79ab	7.79a	7.71a	7.88a	7.83a
T	1593	7.83a	7.79a	7.83a	7.83a	7.71a	7.75ab	7.83a
T	1967	7.71a	7.83a	7.79ab	7.96a	7.67a	7.75ab	7.79a

Comparison of total sensory score for two seasons



Summary of the minimum, maximum and mean prices of a 50kg bag of different green coffee grades at the Nairobi Coffee Exchange between 1st Oct 2013 - 31st May 2014



DEFECTS

Altitude	Variety	Status	Berry borer		Altitude	Variety	Status	Berry borer
1389	R11		2		1377	R11		10
1389	SL28		114		1386	R11		111
1390	R11		60		1390	R11		75
1455	SL28		2		1525	SL28		1
1525	SL28		NO		1567	SL28		9
1793	R11		1		1593	SL28		NO
1810	SL28	Full Sun	NO		1697	R11	Shaded	1
1821	SL28		4		1732	SL28		12
1864	SL28		NO		1793	R11		2
1867	SL28		NO		1848	R11		2
1876	R11		NO		1848	SL28		2
1897	SL28		4		1864	SL28		2
1925	R11		1		1933	R11		3
1933	R11		NO		1967	SL28		NO
1943	SL28		NO					
1967	SL28		NO					

NO: Not observed

DEFECTS cont'

Variety	Status	Elevation	Year	Berry borer
T	shade	1525	2013	NO
			2014	2.0
R11	shade	1386	2013	111.0
			2014	239.0
T	FS	1455	2013	2.0
			2014	6.0
T	shade	1593	2013	NO
			2014	11.0
R11	shade	1377	2013	10.0
			2014	38.0
T	FS	1389	2013	114.0
			2014	51.0
R11	FS	1389	2013	2.0
			2014	13.0

NO: Not observed

CBB damaged coffee beans



General observations

Considering all the factors, no discernable trend was observed in the % grade proportions and sensory characteristics among the samples

For the samples evaluated for 2 seasons, the % AA grade proportion decreased during the early crop compared to the main crop while %AB grade increased.

At lower altitude there was more CBB attack irrespective of the variety or status (Whether under some shade or in full sun)

Going forward

- ❑ Cherry harvesting and processing during the main crop (target 26 samples) for sensory and biochemical
- ❑ Advice the farmers regarding the shade trees
- ❑ Design strategy for project exit

Asanteni
Thank you

