The Agronomy of Kenyan Coffee

Presented By

by

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THE COFFEE MANAGEMENT EXPERTS

- Popuplation-40.5million(580,370sq.km)
- GDP per Capita 852 USD.
- Export Share of GDP:28%
- Coffee Share of exports:2%
- Fourth after Horticulture, Tea and Tourism
- Employment in Agriculture:30%
- Coffee Production 2011/2012:0.802mio bags
- Coffee area 2011/12:140,000 ha-70% small scale.
- Approx. 600,000 small scale farmers
- Approx. 2000 small/medium estates

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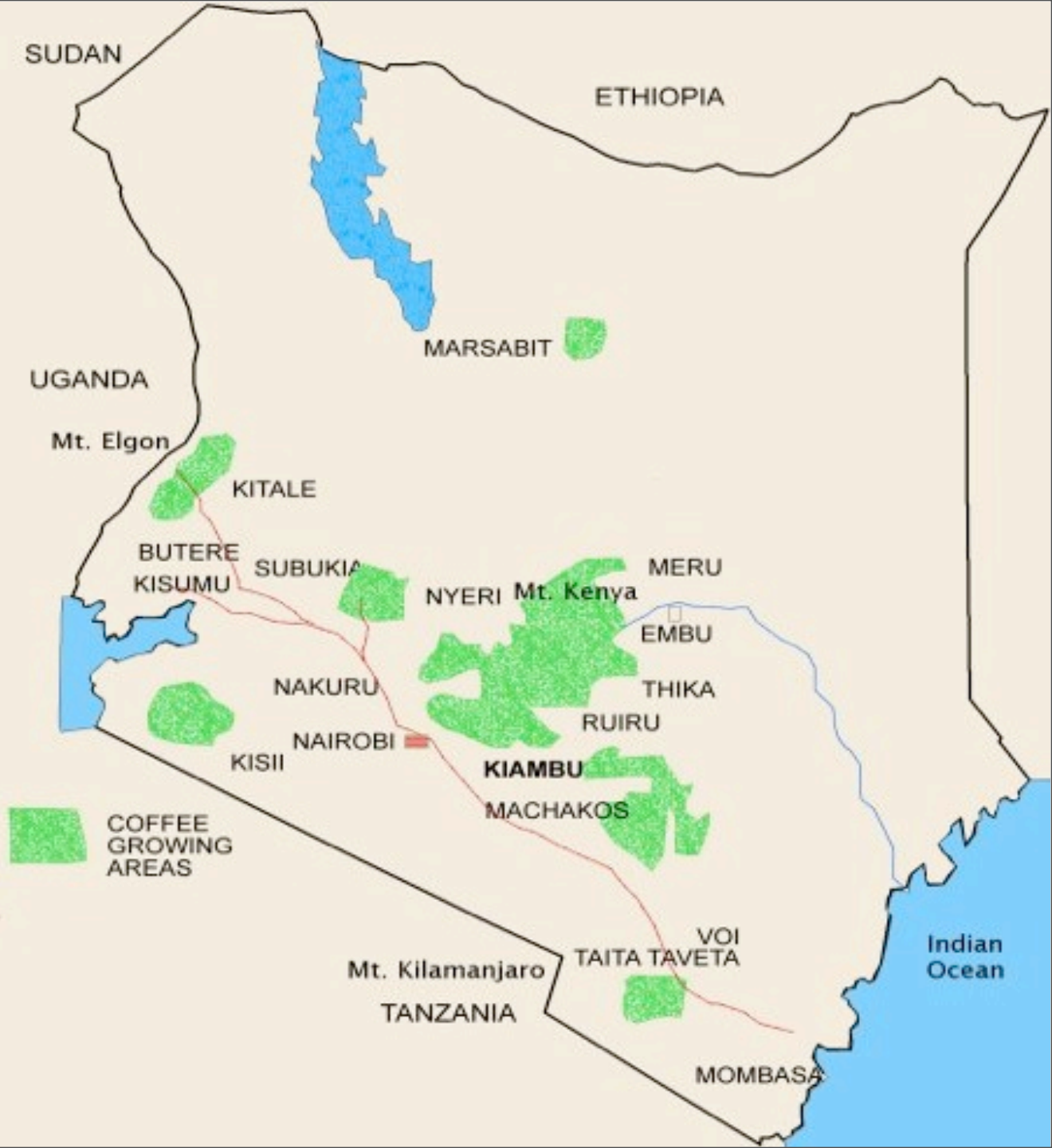
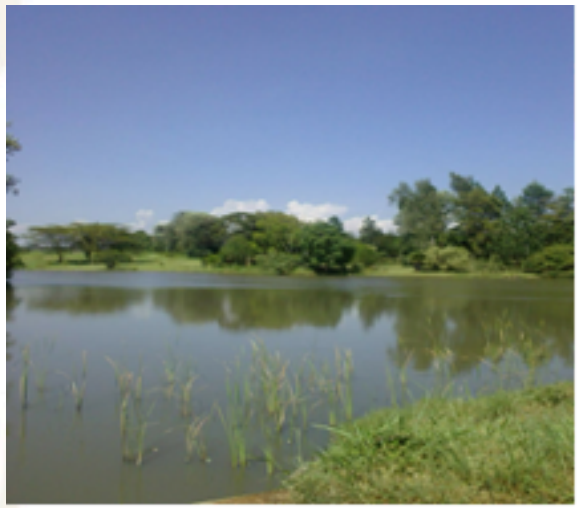
Coffee Growing Areas



- 1400-2100m ASL-East of the Rift valley
- 1500-1900m ASL-West of the Rift Valley
- Max. day temp-32°c
- Min. night temp- 7°c
- Max. temp range-19°c (hot and cold)
- Free draining volcanic soils min 1.5m depth
- Soil pH range 4.4-5.4
- 1000mm of well distributed precipitation



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- Started operations in February 2006
- Started Marketing Agency Feb 2007
- Managing 16 large Estate-1600ha
- Provides quality affordable agro-inputs.
- Certification compliance and sustainable prod
- Milling and Marketing services
- Feasibility studies
- Project Management and Consultancy
- Serving over 200,000 smallholder farmers
- Serving over 383 small & medium estates
- Marketing over 33% of Kenya coffee.
- Direct work force of 300 employees

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Kenya Coffee History

- Arabica → in Ethiopia.
- Robusta → Equatorial forests of Central Africa.
- 600 years ago Coffee → Yemen → Globe.
- Original varieties ⇄ Selection ⇄ Commercial varieties.
- Late 1800 and early 1900 re-introduced in Africa
- 1897 → Kibwezi Kenya as French Mission variety-a derivative of Typica and Bourbon-grown by French in the island of Bourbon now Reunion.
- Bourbon-more upright growth, higher yield and better cup quality than Typica.

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SL.28

- Selected 1931 from a drought resistant variety in northern Tanzania.
- Medium to High altitudes.
- Green shoots-occasionally bronze tips.
- Conical
- Primaries are semi-erect and well rooted.
- Good Yields
- Excellent cup quality
- Susceptible to Coffee Berry Disease and Coffee Leaf rust.
- Recommended spacing 2.74mX2.74m-1330/ha

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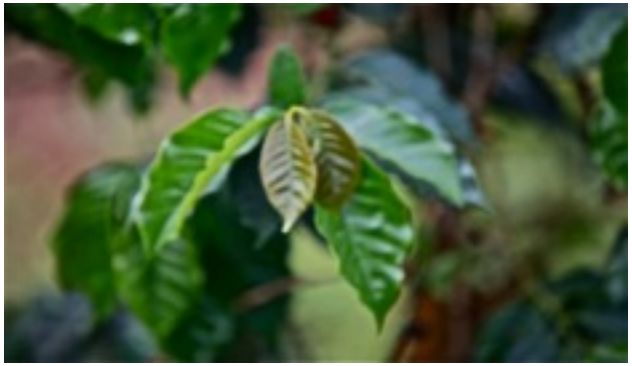
SL.34

- Selected from the French mission cultivars
- High altitudes areas with high rainfall..
- Dark bronze tips with occasionally light green tips.
- Dome shaped
- Primaries are semi-erect and well rooted.
- High yields/good quality.
- Excellent cup quality
- Susceptible to Coffee Berry Disease and Coffee Leaf rust Bacterial Berry Blight.



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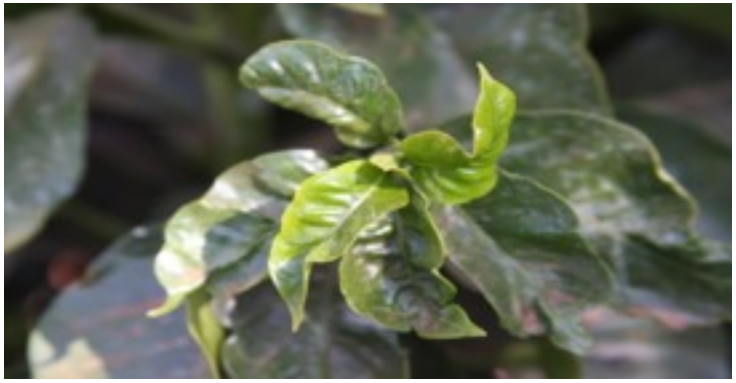
Ruiru 11

- Released in 1985
- A derivative of catimor and Typica.
- Named after the Ruiru Coffee Research Station
- Shallow developed roots
- 2mX2m to 2mX1.5m
- 2500-3300/ha vs. 1330/ha for SL varieties.
- Cup compares well with SL varieties.



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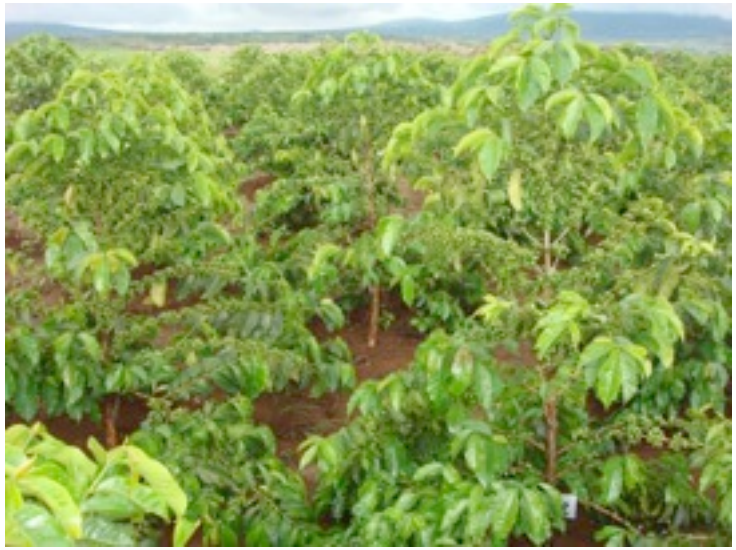
Batian

- Released in 2010
- A pure breed-not Hybrid
- Tall stature like SL 28 and SL 34
- Resistant to CBD and CLR
- High Yields and quality crop
- Requires high nutritional regime.

Other varieties

K7, Blue Mountain and original French Mission- Very minimal.



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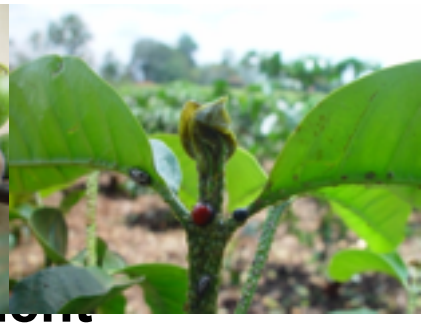
MORPHOLOGICAL DISSIMILARITY

BATIAN

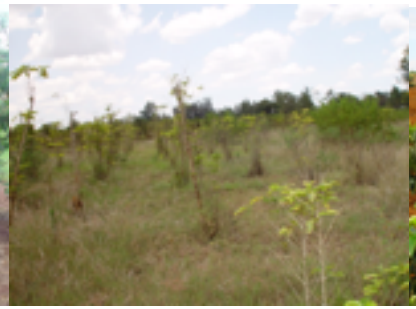
RUIRU 11

SL28

- 6 macro-nutrients-N,P,K, Ca, Mg, S
- 10 micro-nutrients- Zn, Cu, Bo, Fe, Mn, Mo etc.
- N.P.K-mainly ground app 6months before Flowering
- Micro-nutrients- Trace elements as foliar feeds.
- 6months before Flowering NPK fertilizers
- 20kg/year of organic manure.
- Pruning
- Weeding
- Pest and Disease control.
- Soil anslysis, erosion control and Shade management



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Nitrogen- Vegetative growth-shoots

-protein synthesis-better % of AA,AB,PB

- ⇩Nitrogen-High % of C, T, Lights

may result to yellowing, die-bark,

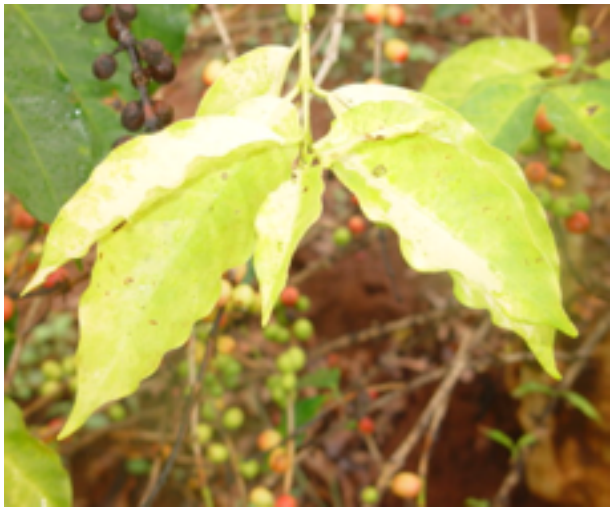
stunted growth.

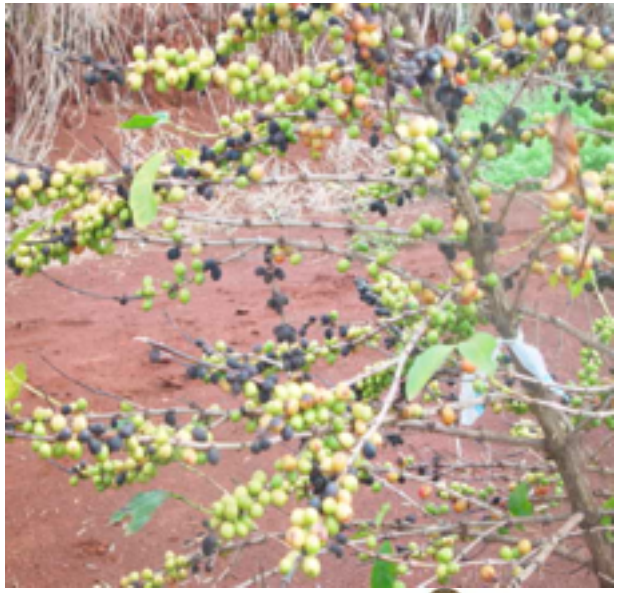
-Flowering and bearing capacity.

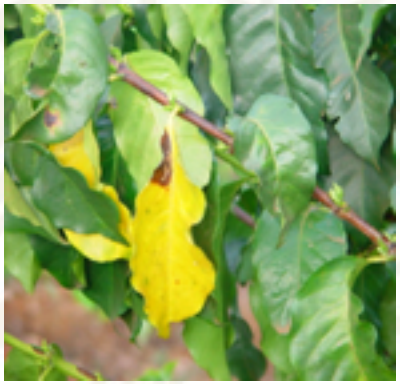
Phosphorous- root development, Wood formation, berry development and early maturity.

Potassium-Berry development, mucilage formation, promotes CO2 and Translocation of foods-

- ⇩ nipping-processing.







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Zinc- initiates flowering and apical growth. 2months
-influences leaf size
- Plant hormone

Boron- promotes shoot growth, optimal flowering,
-fruit setting.2 months before.
- Deficiency leads to abortion incidence

Magnesium-Food formation-chlorophyll,
-Bean colour-Blue/green colour

Iron -Chlorophyll formation, bean colour.
amber beans.

Sulphur - responsible for aroma of the roast.

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Coffee Berry Disease (CBD)-*Colletotrichum kahawae*

-high attitude, wet humid/cool condition.

-black sunken spots in green rapid expanding berries, ripe berries and flowers

-can cause 80% of crop loss

-affects quality in mature beans-BB.

Leaf Rust- *Hemileia vastatrix-(fungi)*

-yellow sunken spots underside of leaves.

-Warm humid condition ⇒ leaf fall and die back.

Bacterial Berry Blight(BBC)-*Pseudomonas Syringae*

Rift and West of Rift. Black dark leaves and buds.

- About 350 diseases affects coffee globally.
- 800 pests known to attack coffee globally.
- 35 known pests affects coffee in Kenya.
- Root feeders
- Stem/branch borers.
- Leaf feeders
- Sap feeders and
- Berry/Flower feeders
- Control mainly approved Pesticides, IPM and cultural practises.

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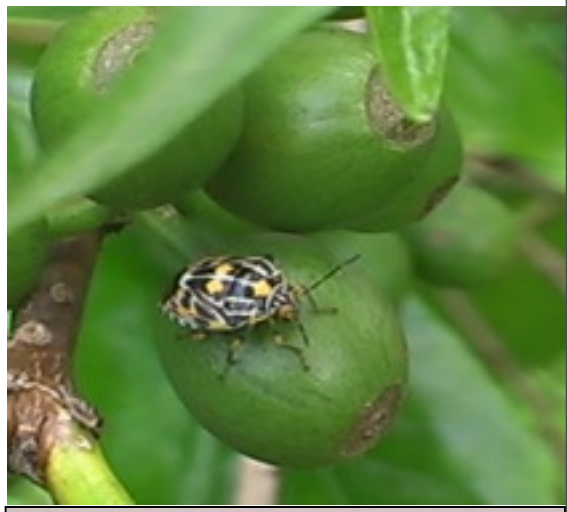
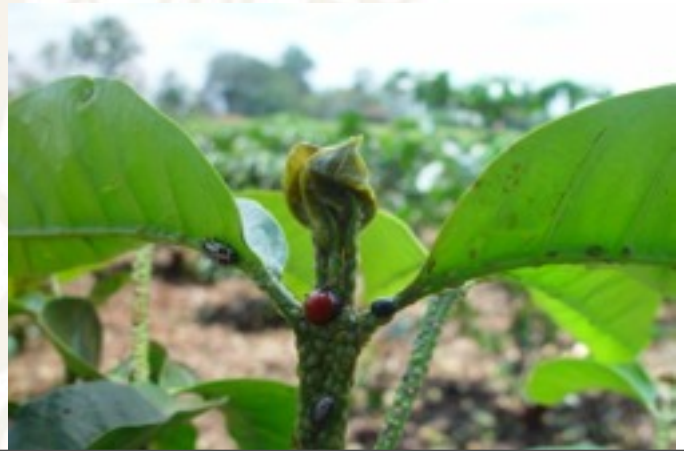
Antestia Berry feeder. Feeds on mature green berries. Causes Zebra lines on parchment and bitter cup.
-Pruning to open tree and IPM-use of parasitoids



Scale Pests-Sucks sap from young shoots and suckers
Can cause weak trees with shriveled beans.
IPM –use of Bio-control predators –Lady birds

Thrips- Sucks saps from leaves. Mainly dry weather,
-grey silver patches on the underside of leaves,
-no photosynthetic activity, drops off.
-coffee bush takes long to recover- Biennial cropping
-and die back



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- Kenya's selective hand picking
- 90% wet washing and rest 10% dry processed
- Picking mainly 10-14 days
- Only red ripe cherries
- Sorting under-ripe, diseased, over-ripe a must
- Same day de-pulping.
- Fermentation to remove mucilaginous sugary compound normally 10-16 hours- though weather dependent.
- Washing and Density grading leads to P1,P2, P3 & PL
- 100% sun drying.- reduces 55%MC to 10.5% M.C
- Regular turning and covering to avoid fast drying.

DEFFECT	CAUSE
Ragged beans	Lack of nitrogen, weeds, Poor pruning
Foxy beans	Delayed harvesting/pulping
Diseased beans	Brown Blight(late CBD attack)
Insect damage	Berry borer attack, etc
Antestia damage	Antestia attack
Pulper damage	Poor setting of pulper discs
Over-fermented beans	Prolonged fermentation
Stinkers	Severe overfermentation
Green-water damge	Rewetting
Black beans	Severe Rewetting
Woody beans	Prolonged storage

GRADE	Description of the Grade
E 8.3mm	(Elephant). Two beans joined together. Mainly as a result of well nourished coffee bushes. May also result from genetic “defect”.
AA 8.2-7.2mm	Flat bold beans from well nourished coffee. Each fruit produces two beans. Forms uniform roast.
AB- 7.1-6.4mm	Flat beans, similar to AA but smaller in size. Forms good roast.
PB 6.6-4.7mm	(Pea Berry). One ovule develops instead of the usual two. The bean is oval in shape like peas.
C- 6.3-4.0mm	Smaller Flat beans. Are an indicator of dry growing conditions.
TT 8.3-6.4mm	AA and AB grades which are of lower density and quality(Light). Are an indicator of poor soils.
T 3.4mm	Smallest of the flat beans and consists of big fragments. Mainly an indicator of poor soils and poor precipitation.
Mbuni	Not Grade as such. Dry processed beans. They are not graded according to shape or size but by density. Very inferior in quality

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Nyeri

- Bright Acidity, Medium Body and Floral Flavor

Kiambu/ Muranga

- Bright Acidity, Strong Body and Medium Flavor

Machakos

- Light Acidity, Medium Body and Medium Flavor

Kitale/ Kisii/ Bungoma

- Medium Acidity, Medium Body and Some Flavor.

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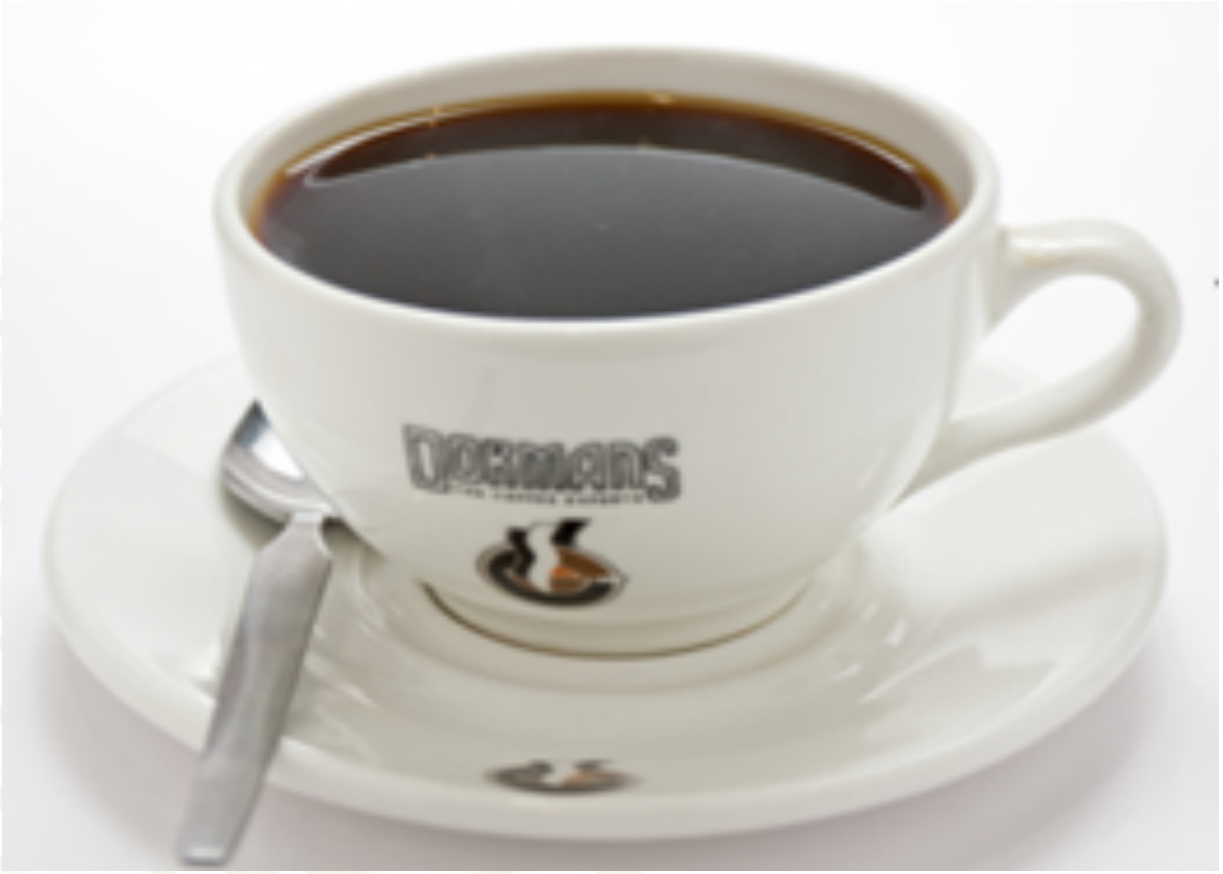

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