

COFFEE PLANTATIONS IN THE CENTRAL AMAZON RAIN FOREST OF PERU - CHANCHAMAYO VALLEY

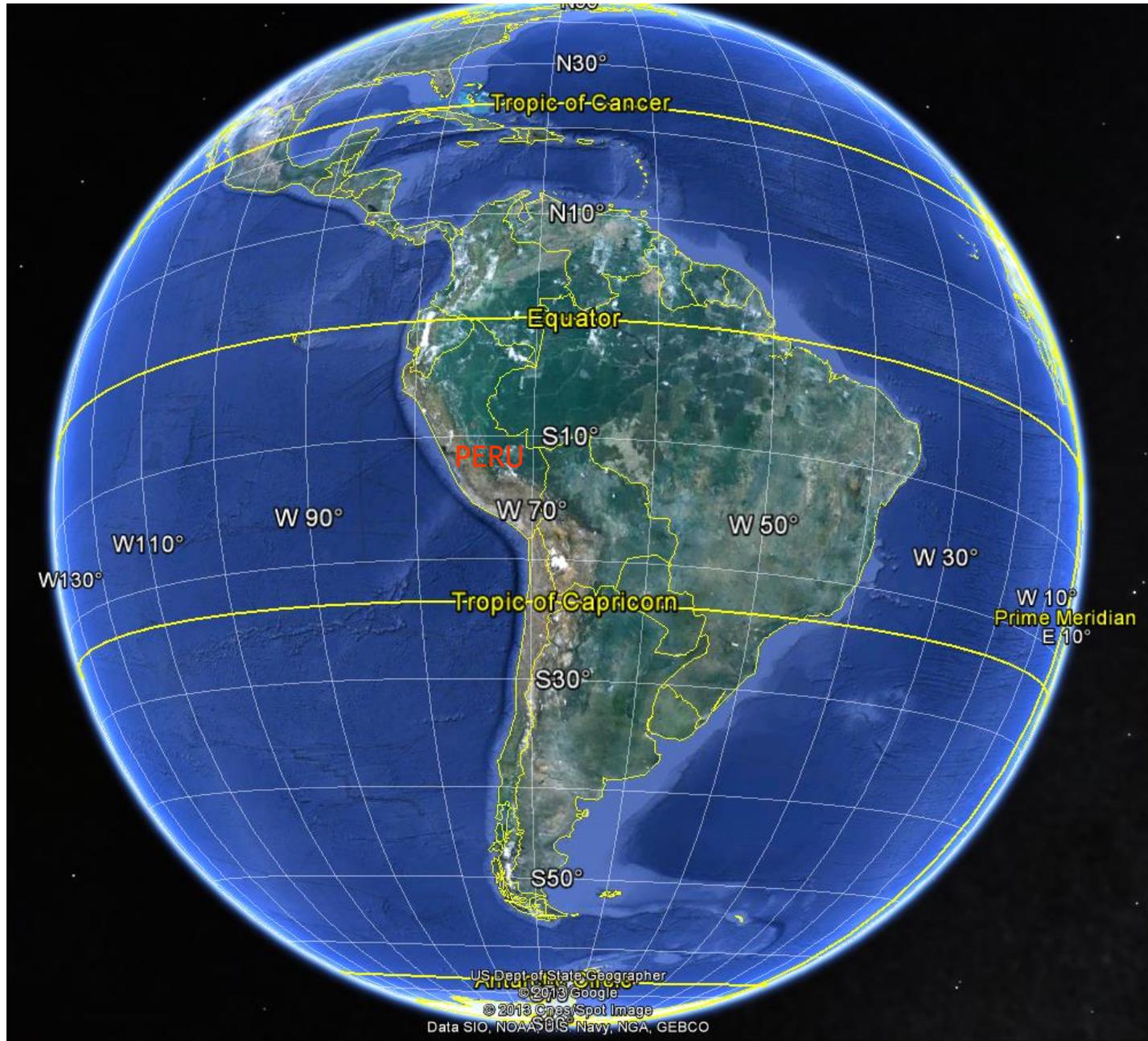


By David Aquino

Where is located Peru?

- ▶ Peru is located on the continent of South America.
- ▶ Peru is bordered by the South Pacific Ocean to its west, Ecuador and Colombia to its north, Brazil to its east and Chile to its south.
- ▶ Peru's total area is 1,285,220 sq km.

SOUTH AMERICA



MAP OF PERU



HISTORY OF PERU

- ▶ Peru is best known as the heart of the Inca Empire.
- ▶ Cuzco was the capital of the Inca Empire.
- ▶ Francisco Pizarro and his band of Spanish conquerors arrived to Peru in 1532.
- ▶ Peru was a Spanish colony from 1542 to July, 1821.
- ▶ Lima is the capital of Peru and it was founded in January 18, 1535.



Ambition Unbound
After centuries as a growing local power, the Inca dreamed of a greater realm. They went on to conquer 300,000 square miles in a few generations.

1 ca 1400
Having subdued their neighbors, Inca kings launch their first conquests beyond the Cusco region.

2 ca 1470
Pushing to the coast, the Inca defeat the Chimú Empire and carry off many Chimú artisans.

3 ca 1500
Turning south, the Inca capture a vast territory, extending their reach to the edge of Patagonia.

4 ca 1532
In a final thrust along the eastern slope of the Andes, the Inca expand farther into the Amazon Basin.

Click to view Sacred Valley detail

THE INCA EMPIRE

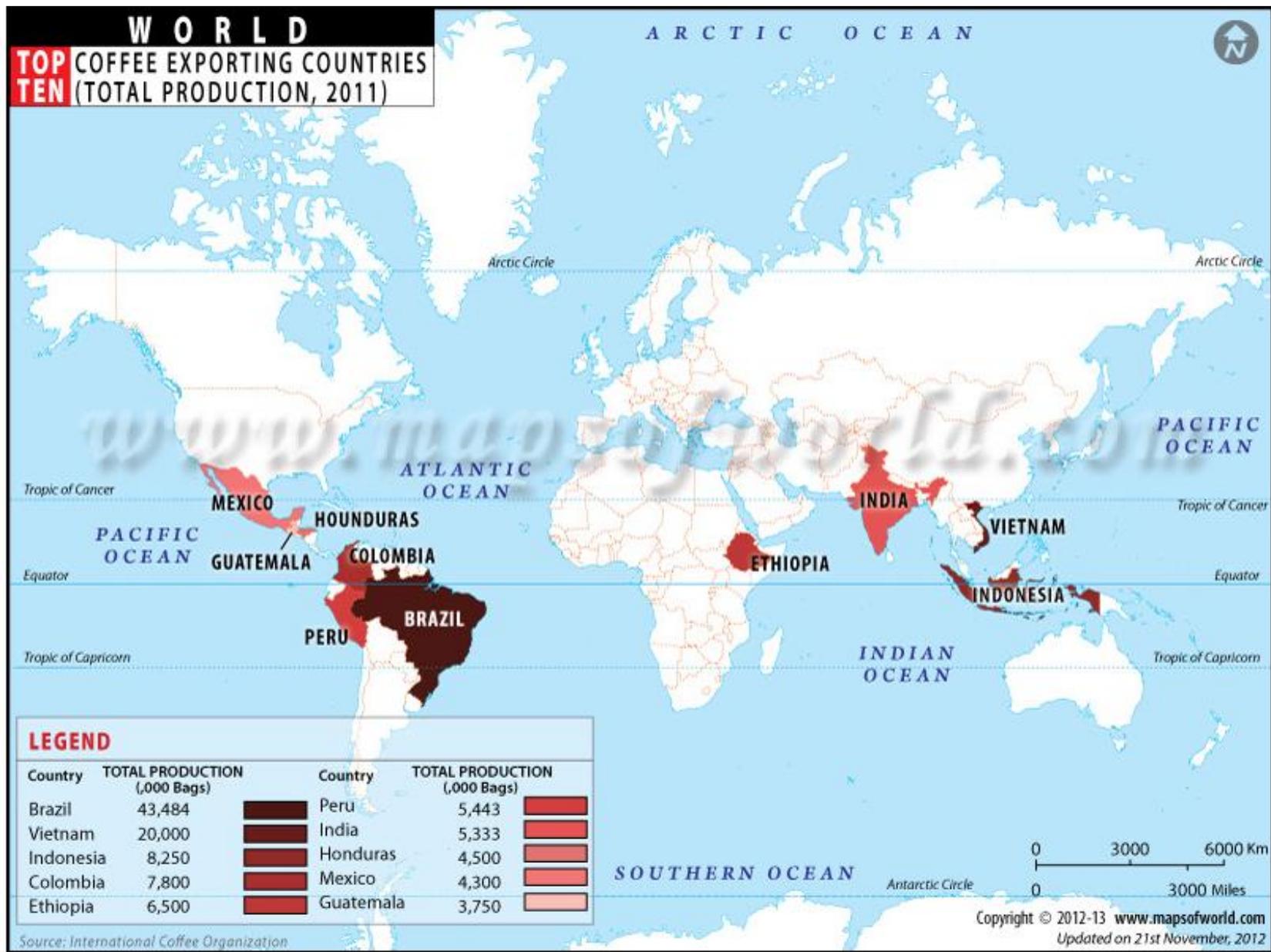
Employing a shrewd combination of diplomacy, intermarriage, and military coercion, the Inca conquered a vast realm extending 2,500 miles along the mountainous spine of South America. At their height, they ruled as many as 12 million people, who spoke at least 20 languages. This fractious conglomeration quickly fell apart after the Spanish conquest in 1532.

WILLIAM E. McNULTY, LAWSON PARKER, AND LISA R. RITTER, NGM STAFF. LANDSAT IMAGE (INSET): GLOBAL LAND COVER FACILITY

SOURCES: BRIAN S. BAUER, UNIVERSITY OF ILLINOIS AT CHICAGO; R. ALAN COVEY, SOUTHERN METHODIST UNIVERSITY; TERENCE N. D'ALTROY, COLUMBIA UNIVERSITY

Coffee Industry of Peru

- ▶ Coffee has been grown in Peru since the 18th century.
- ▶ Coffee is Peru's main crop, with 400,000 hectare under cultivation.
- ▶ Peru is one of the top ten coffee-producing countries, and remains the world's leading exporter of organic coffee, with 90,000 certified organic hectares.
- ▶ There are over 110,000 farmers growing Peruvian coffee, and the beans are the country's top agricultural export.
- ▶ Coffee exports make up around 2 percent of the Peruvian national economy.
- ▶ The majority of Peruvian coffee is grown using high quality Arabica seeds grown in shaded conditions at high altitudes, between 1,000 and 2,000 meters.
- ▶ A deadly fungus disease, known as **Coffee rust** ('roya amarilla' in spanish), has destroyed a huge amount of Arabica coffee production in 2013/14.
- ▶ The USDA is forecasting a 4 percent over 2014/15 year, and a 30 percent increase over 2013/14.
- ▶ Peru exports coffee to 46 countries, but the bulk - 60 per cent - goes to Europe (Germany, Belgium, Holland, and Sweden). Approximately 30 per cent goes to USA.
- ▶ Germany is Peru's largest single coffee customer.



Description : This map shows the top ten coffee exporting countries by production of the world, for the 2011 crop year. One bag weights 60 kilograms.

WORLD

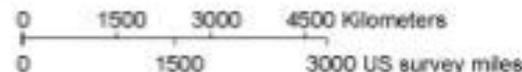
TOP TEN Coffee Importing Countries



LEGEND

Country	Imports in US\$' 000 (2008)	Country	Imports in US\$' 000 (2008)
U.S.A.	4,121,228	Belgium	1,204,122
Germany	3,344,098	Canada	789,431
Italy	1,382,895	Spain	752,415
France	1,381,309	U.K.	631,785
Japan	1,272,614	Austria	454,791

Source: FAO Statistical Yearbook, 2010



GEOGRAPHY

REGIONS OF PERU AND RIVERS

- ▶ Peru has three major Regions (see next map):
 - ▶ Costa: a narrow western costal plain.
 - ▶ The costa is dry desert area.
 - ▶ This region is dry for three reasons: (1) the Andes block rain-bearing winds from the Amazon Basin; (2) air masses moving toward the coast out of the South Pacific high-pressure system produce little rainfall; and (3) northward-flowing cold water off the coast (the Peru current, also known as the Humboldt Current) contributes little moisture to surface air masses.
 - ▶ Sierra: the high and rugged Andes mountains in the center. With temperate to frigid temperatures.
 - ▶ Selva: Hot and humid tropical Amazon rainforest (Ceja de Selva, Selva Alta, and Selva Baja)
- ▶ Amazon River and tributaries can be see on page 4 map and on the next map.
- ▶ **Where is coffee grown in Peru?**
 - ▶ Selva Alta region. The area is characterized by deep forest-covered valleys and widely plunging rivers.
 - ▶ The three prominent coffee growing areas, located in the eastern slopes of the Andes, are **Chanchamayo**, the Amazonas and San Martin Regions.

MAP OF REGIONS OF PERU



REGION		SUPERFICIE	
DENOMINACION	COLOR	ha.	%
COSTA		15' 087. 282	11,74
SIERRA		35' 906. 248	27,94
SELVA		77' 528. 030	60,32
			
			
SUPERFICIE TOTAL		128' 521. 560	100,00

FUENTE: INRENA - PERÚ

100 0 100 Km

COSTA (Piura)



SIERRA (Ticlio)

PERUVIAN CENTRAL ROAD CLIMBING THE ANDES IN ROUTE TO CHANCHAMAYO



SIERRA (Jauja)



SELVA ALTA (Chanchamayo)



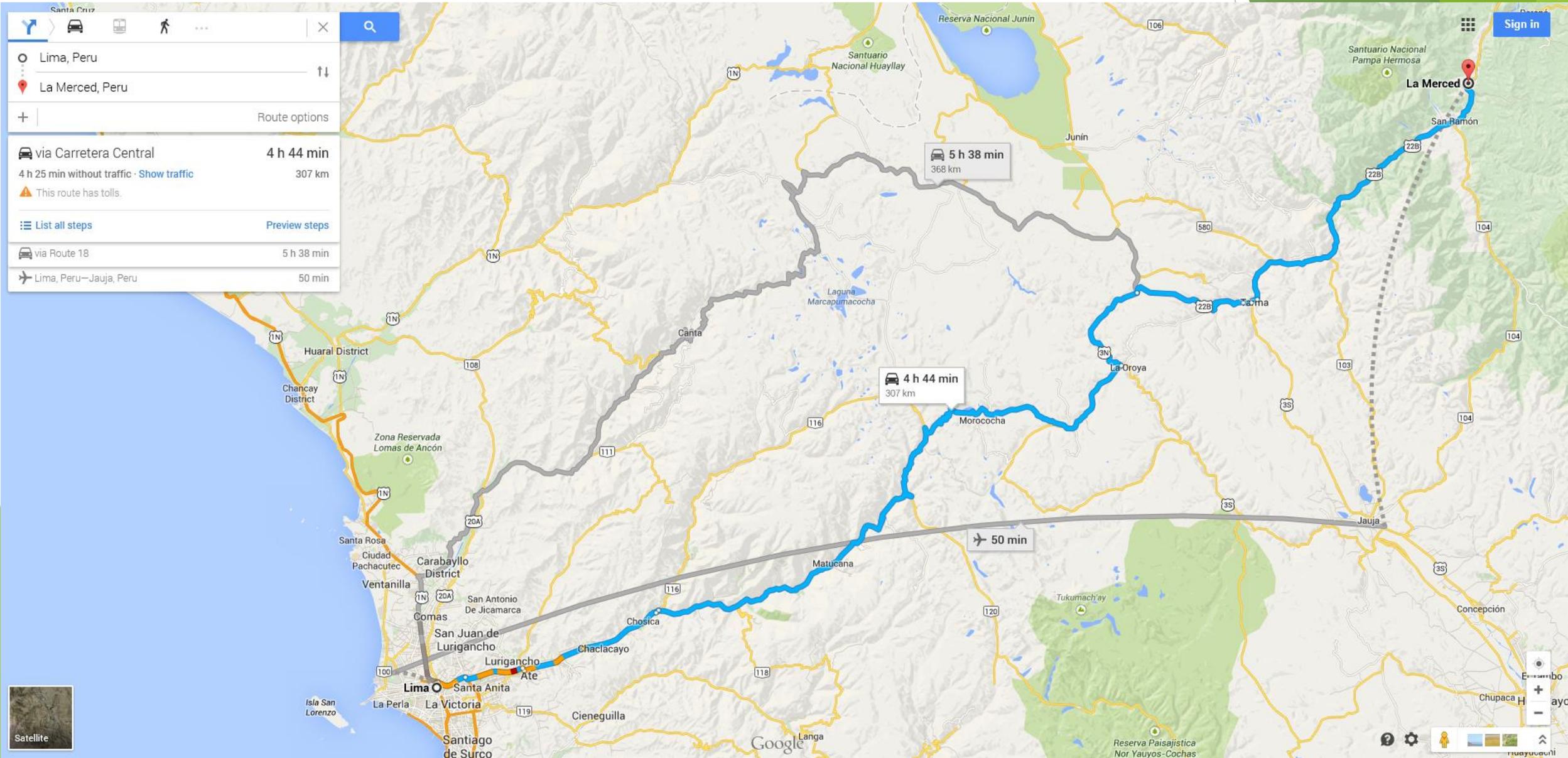
CHANCHAMAYO VALLEY, JUNIN, PERU



MAP OF JUNIN
PROVINCE OF CHANCHAMAYO



ROAD NETWORK FROM LIMA TO LA MERCED - CHANCHAMAYO



CHANCHAMAYO VALLEY



LA MERCED - CHANCHAMAYO



COFFEE PLANTATIONS IN CHANCHAMAYO - CENTRAL JUNGLE OF PERU

- ▶ Chanchamayo valley was land of the asháninkas (natives).
- ▶ Spanish Franciscans missionaries started establishing settlements in this region from 1635-1742.
- ▶ Natives asháninkas rebelled in 1742 and reconquered their lands until 1847.
- ▶ San Ramon city was founded in 1850.
- ▶ La Merced City (capital of chanchamayo) was founded in September 24, 1869.
- ▶ European immigrants (Italians, Germans, and French) arrived in 1871, and started to settle in Chanchamayo.
- ▶ Coffee was introduced in Chanchamayo valley at around 1850.

COFFEE PLANTATIONS IN CHANCHAMAYO

- CENTRAL JUNGLE OF PERU

- ▶ Coffee plantations are located in the eastern foothills of the Peruvian Andes.
- ▶ The Central Jungle produces 25 percent of the coffee of Peru.
- ▶ Yields vary from 400 to 600 kg/ha.
- ▶ **Coffee is planted on all types of land, and little erosion or soil loss occurs because the coffee trees simulate natural forest conditions, providing shade and fixing nitrogen.**
- ▶ Shade-Grown coffee farms create a micro climate that helps to conserve the environment, flora, fauna and the aquifers.
- ▶ Diseases affecting coffee plantations, such as *broca* (*Hypothenemus hampei*) and **roya amarilla** (*Hemileia vastatrix*), can be caused by large extension or excessive density of the crop.
- ▶ The few alluvial terraces with the most fertile soils support large plantations of citrus fruits, avocados, papayas, pineapples, and other tree fruits that are often harvested on hillsides.
- ▶ Corn, beans, peanuts, and cassava, as well as bananas and other tree fruits, are also planted on small plots for subsistence purposes.

COFFEE (Coffea Arabica) PLANTATION REQUIREMENTS - CHANCHAMAYO VALLEY

► CLIMATE:

The coffee tree requires heat, humidity and abundant rainfall:

- Tropical and Sub-tropical regions with temperatures between 18°C and 25°C.
- Precipitation: annual precipitation between 1000 and 2500 mm.
- Altitude: 1000 to 2000 metres asl.
- Relative humidity (%): 70-95.

➤ SOILS AND TOPOGRAPHY:

- Inceptisol and Alfisol soils.
- Alluvial soils with good permeability and drainage, and avoid clay soils.
- Terrain with slopes up to 100%.

➤ SHADE TREES:

- *Inga* spp. (paca or guaba), *Juglans neotropica* (nogal), banana tree, *eucalyptus* spp, and *pinus* spp.

➤ LABOUR:

- Coffee cultivation requires a large number of labour forces because coffee is to be hand-picked.



COFFE PLANTATIONS WITH SHADE TREES IN VILLA RICA



Coffea Arabica varieties:

- ▶ coffee varieties typical of 55%, Caturra ripening yellow and red 35%, bourbon and pache 5%
- ▶ Typical
- ▶ Caturra
- ▶ Bourbon
- ▶ Pache

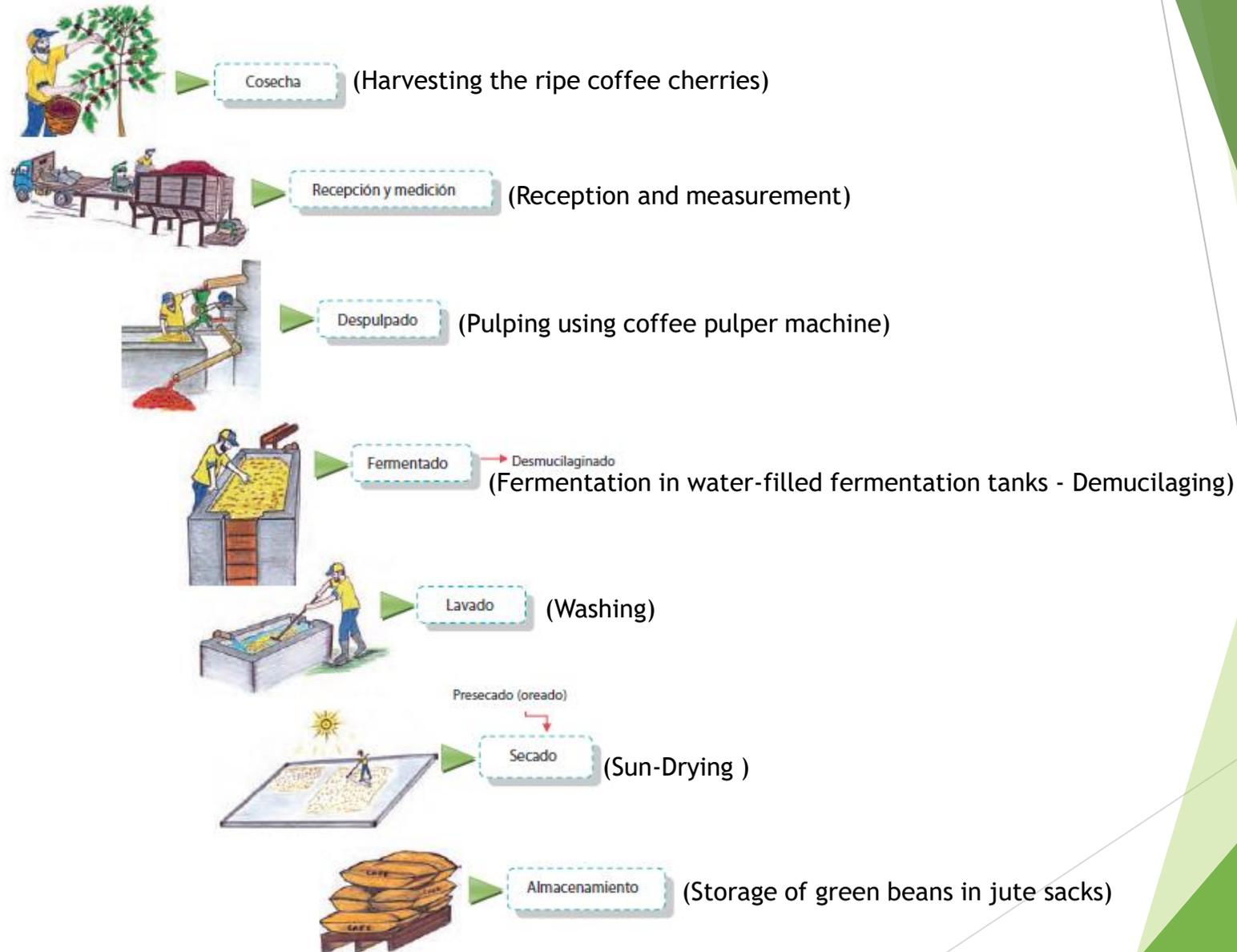
Physiology cycle of coffee crop

Mes	Set	Oct	Nov	Dic	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago
Etapa	Floración			Llenado de grano				Cosecha				Descanso



Source: DESCO Perú, Producción de cafés especiales, Manual Técnico, 2012.

COFFEE PROCESSING: FROM CHERRY TO BEAN



Source: DESCO Perú, Control de Calidad del Café, Manual Técnico, 2013.

COFFEE LEAF RUST DISEASE

- ▶ This fungus known as roya amarilla in Spanish, has destroyed a huge amount of coffee production in Peru in recent years.
- ▶ Coffee rust (*Hemileia vastatrix*) is a fungus, a leaf rust that first shows up as yellow spots on the leaves of coffee plants. Then it curls them up and causes the round coffee fruits to drop to the ground before they can mature.



Hemileia vastatrix, causing Coffee rust.



OTHER VERY IMPORTANT COFFEE ZONES IN THE CENTRAL AMAZON OF PERU: SATIPO, OXAPAMPA AND VILLA RICA

- ▶ Satipo
 - ▶ Satipo city was founded in 1940.
 - ▶ First Europeans arrived in this province in 1673.
- ▶ Oxapampa and Villa Rica
 - ▶ Both towns have been developed by Austrian and German immigrants. They are located on the eastern side of the Pasco region, in the central jungle of Peru.
 - ▶ Oxapampa was founded in 1891, and Villa Rica in 1925.

INSTITUTO REGIONAL DEL CAFÉ - SELVA CENTRAL

- ▶ <http://www.youtube.com/watch?v=xnRIWZNX14k> (Video - 8 minutes)
- ▶ This video Shows:
 - ▶ Junín Province
 - ▶ Climate
 - ▶ Biodiversity
 - ▶ Coffee plantations
 - ▶ Shade trees and how to manage shade (coffee needs 60% exposure to sunlight)
 - ▶ Pruning
 - ▶ Farmers handpicking ripe cherries.
 - ▶ Depulping and storing the beans in concrete fermentation tanks.
 - ▶ Washing the fermented coffee beans.
 - ▶ How to dry coffee beans in drying patios.

ADDITIONAL INFORMATION:



- ▶ COFFEE MOUNTAIN VILLA RICA (7 minutes video):
 - ▶ http://www.youtube.com/watch?v=K3kYPrHR9_g
- ▶ SENASA Perú: Conoce la Roya del Café - February 13, 2014 (5 minutes video)
 - ▶ <https://www.youtube.com/watch?v=3CQMoNLFTN4>
- ▶ INIEA Perú : LA PRODUCCION DE CAFÉ - Curso Taller 01- March 7, 2014 (12 minutes video)
 - ▶ <https://www.youtube.com/watch?v=CcKSQhmXhKw>
- ▶ DESCO Perú: Producción de cafés especiales, Manual Técnico, 2012.
 - ▶ http://www.desco.org.pe/sites/default/files/publicaciones/files/manual%20cafe_selva_VF.pdf
- ▶ DESCO Perú: Control de calidad del café, Manual Técnico, 2013.
 - ▶ http://www.desco.org.pe/sites/default/files/publicaciones/files/calidadcafe_VF.pdf
- ▶ Carbon stock in agroforestry coffee plantations with different shade trees in Villa Rica, Peru. Agroforestry System, Volume 90, June 2016, Issue 3, pp 433-445.
 - ▶ <http://link.springer.com/article/10.1007/s10457-015-9865-z>