A bird's eye view

FINCA SANTA ELENA

TAPACHULA, CHIAPAS, MEXICO

Prepared for the CEC by
Julian Haber, International MBA
<jhaber@schulich.yorku.ca>
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Finca Santa Elena
Tapachula, Chiapas, Mexico

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Executive Summary

Issue
A growing number of consumers wish to purchase organically and sustainably produced goods like shade coffee. In fact, certified organic shade coffee is the next big thing for the socially conscientious consumer. This high-quality premium coffee costs the buyer, and ultimately the customer, more because more direct benefits are given back to the workers, and the ecosystem in which the coffee is grown. But environmentally savvy consumers are willing to spend more for the peace of mind they get from knowing that their cup of coffee was not made from beans grown to the detriment of the region's biodiversity, sprayed with pesticides and harvested by underpaid workers.

The premium prices buyers can charge consumers allow them to pay more to producers. This encourages producers to say that they sell shade-grown coffee. Unfortunately, in some cases these claims are false. Only with third-party verification, through a certification system, can consumers be certain that the coffee they buy has actually been grown in a sustainable manner.

The following report provides an overview of the actual operations of a Mexican shade coffee farm called Santa Elena. Santa Elena produces 100% organic shade coffee, which has received ECO-O.K.™ certification from the Rainforest Alliance. The 267-hectare farm is located in the lush hills of the Sierra Madre de Chiapas, close to the city of Tapachula in the state of Chiapas. In the crop year 2000 it exported 65 tons of green coffee, mainly to the United States. Santa Elena's mission is to run a profitable business while practicing conservation, protecting biodiversity, generating employment and maintaining positive, mutually beneficial relationships with local communities.

Purpose
The purpose of this report is to raise public awareness of shade coffee in general and Santa Elena in particular; to explain how shade-grown coffee is a form of sustainable agriculture; and to clarify and define the relationship of shade to coffee trees.

Scope
This paper encompasses the past and present of Santa Elena, providing background information on its history and conservationist culture, which led Everardo Bernstorff Pérez, the current owner and manager, to turn the farm into a completely organic operation in 1996. The farm obtained the social/environmental seal of approval in 1999 when it received ECO-O.K. certification from the Rainforest Alliance.

Santa Elena's commitment to conservation is reflected in the fact that is has received two internationally recognized certifications: one from the from Rainforest Alliance, as mentioned above, and the other from the Organic Crop Improvement Association (OCIA). The farm's wealth of biodiversity, especially migratory songbirds, provides living testimony to its harmonious relationship with nature. The symbiotic relationship between shade tress and coffee shrubs is shown to be the key to

understanding sustainable agriculture in the context of coffee cultivation. Santa Elena's policies regarding soil, water, organic fertilizers and waste management are also critical components of this system.

Another important part of this report focuses on the coffee itself. From bean to border, the entire system of growing and processing washed green organic coffee for export is described. Santa Elena's commitment to people is shown through an in-depth look at the lives of its workers, which sheds light on the direct benefits they receive, the type of work they do, their accommodations and the wages they earn.

Annex 1 contains a succinct discussion of the key differences between full-sun, or "technified," coffee farms and shade-coffee farms. It also includes a brief overview of the current global coffee market that lists the main producers and importers as well as the major companies that dominate the industry. Finally, Annex 1 takes a quick look at the growing global demand for organic and sustainably produced products.

Key Concepts

Santa Elena is committed to providing the highest-quality coffee by practicing sustainable agriculture that protects and conserves the biodiversity of its lands. Santa Elena is equally committed to providing a healthy living and work environment for its workers to whom it provides generous direct benefits. To these aims, the plantation guarantees the following:

- It only produces 100% organic shade-grown coffee.
- It practices sustainable agriculture—which means conscientious management of the ecological, social and economic impact of its activities on its lands.
- No chemical pesticides are used on the coffee at any stage of production.
- Wildlife, especially migratory songbirds, are protected.
- All the farm's workers receive generous compensation, allowing them to maintain a good standard of living.

Santa Elena's Mission Statement

To run a profitable 100% organic shade-grown coffee farm while practicing conservation, protecting biodiversity, generating employment and maintaining positive, mutually beneficial relationships with local communities.

Basic Facts about Santa Elena

Name of farm	Finca Santa Elena
Owner and manager	Everardo Bernstorff Pérez
Administrator	Flor de María Fuentes Ruiz
Office address	1ª Avenida Norte y 25 Oriente, Tapachula, Chiapas, México
Telephone	+(52) 962-651-35 and 501-38
Fax	+ (52) 962-651-64
E-mail	Santa_Elena_coffee@msn.com
Web site	See link at: www.canintrad.com
Type of business	Washed green coffee producer and exporter
Market sector (B2B)	Green coffee importers
Other business units	A roaster and distributor based in Austin, Texas: Santa Elena Coffee Company Tel: (0) (512) 846-2908 Fax: (512) 846-2710 (direct) (512) 762-5057
Number of employees (varies annually)	Permanent: 50 Seasonal: 300-600
Location	27.5 kilometres on the highway to Nueva Alemania Tapachula, Chiapas, Mexico.
Size of farm	267 hectares (1 hectare = 2.47 acres), divided into 10 sections known as *pantes*. These *pantes* are: Galeras, Carmen I, Carmen II, San Ramón, Rio Grande, Dos Rios, Rincón, El Mango, San Antonio, San Fernando
Cultivated area	240 hectares
Varieties of coffee grown	Bourbon, Catuhai, and some Catimor plants, though the main product of the farm is Bourbon.
International Classification of Finca Santa Elena Coffee	Other Milds Arabica
Varieties of shade trees grown	Varieties of *Inga* and local species.
Elevation	600 to 800 meters above sea level
Topography	Undulating hills
Sources of water	Two rivers, one crossing the farm from north to south entering near the community of San Juan Chicharras and leaving through the Ejido el Eden. The second river crosses the farm from south to west, entering from the Ejido el Eden and flowing into the Finca Alicia. There are also a number of unmarked springs.
Water treatment facilities	A traditional method of water treatment using a filtration system of sand, gravel and stone. Used water is filtered as it passes through a canal system. Santa Elena is developing plans for a modern water treatment facility.
Average rainfall (last	4865.64 mm

five years)	
Rainy season	April to November
Energy	A hydroelectric generator, built in 1902, supplies Santa Elena, and nearby farms Guanajuato and San Juan Chicharras with power. Gas is used to power the water heaters, stoves and mill-house dryers. Diesel is used for some of the mill-house machines.

1 Overview

Papaya, lemon, breadfruit, avocado and banana trees…bamboo groves, palms, towering ceiba trees adorned with pink bougainvillea and flowering bromeliads…peacocks, hummingbirds, scarlet macaws, warblers and flycatchers…green mountains on every horizon….

Welcome to Finca Santa Elena, a little piece of paradise in Chiapas, Mexico, where 100% organic shade coffee is grown. The Bernstorff family, the founders and owners of Santa Elena, run their farm with passion, according to principles they have had since its founding. The first of these involves a commitment to running a profitable and socially responsible organic coffee farm that conserves and protects biodiversity. The Bernstorffs have been caring for their lands and the people who work them for more than 75 years. Every year since its founding in 1926, Santa Elena has provided much-needed jobs for as many as 600 people in good crop years. Santa Elena's employees work hard but live well as we shall see. They can enjoy the farm's diverse wildlife, which is protected (hunting is strictly prohibited). Santa Elena's tall forest trees are home to hundreds of species of migrating songbirds, whose morning and evening songs make this a wonderful place to live. As close to nature as a working farm can possibly be, Santa Elena is also rich in biodiversity and healthy soil, which is replenished each year with recycled organic fertilizers. The Bernstorffs are proud of their conscientious management of the land. They believe that taking care of business means taking care of their workers and the land they all depend on. Santa Elena is truly a remarkable place, and it is with pleasure that we begin this tour together.

Santa Elena's Commitment to Quality

Quality

At Santa Elena, quality is defined simply: excellent coffee. Santa Elena assures the excellence of its product by selecting only the best coffee cherries from the well-tended coffee trees. The green coffee, known at the farm as *café de oro,* or "gold coffee," is handpicked and hand-selected. Moreover, it is 100% organic, as certified by the Rainforest Alliance, and free of defects that could adversely affect its flavor.

Santa Elena's concern with quality is also reflected in its ongoing commitment to the environment, the land and the workers involved in the production of the *café de oro.* In addition, its commitment to quality means that buyers receive an excellent product and reliable service and that their contracts are processed efficiently.

Reliability

At Santa Elena, reliability is defined as the ability to deliver the product according to buyers' specifications in a manner that satisfies, or exceeds, their expectations.

Availability

Santa Elena guarantees availability of only the freshest current year's product. Santa Elena will never sell anything but 100% organic coffee produced on its own lands and certified by the Rainforest Alliance.

Pricing

A base price is determined by prevailing futures prices at The New York Stock Exchange's commodities market, or "C" market <www.ino.com>. Santa Elena then negotiates a premium for its specialty coffee.

Portrait of Santa Elena

Location

Santa Elena is located in the lush hills of the Sierra Madre de Chiapas, in Nueva Alemania, 27.5 kilometers from Tapachula in the state of Chiapas, Mexico. These hills, rising inland from the hot, fertile coastal Soconusco Plain, are blessed with the richest soil in all of Mexico, making agriculture, especially coffee, the region's main industry.

History

When Johann Bernstorff Wangenheim left Germany in 1912, he had no idea that 89 years later part of his legacy would be a farm producing some of Mexico's finest coffee. In fact, because he arrived in Mexico in the midst of the Revolution, he planned to leave as soon as he had made enough money to move north to the United States. He had stepped off the boat with no knowledge of Spanish and very little money and therefore sought work as a field hand on a coffee farm in Chiapas.

A hard worker, Johann didn't have to wait long before he had enough money in his pocket to keep moving on. But by then he no longer cared about leaving Mexico because he had fallen in love with a woman from Chiapas named Carmen Pérez. They married, and he continued to work diligently for local coffee farms, working his way up the ranks. Twenty-nine years later he became the owner of 3,800 hectares of lands. On his estate he produced coffee, African palm, cacao and timber. In the early 1950s, Juan, as he now called himself, gave one part of his lands, namely, Santa Elena, to his son, Everardo Bernstorff Pérez. Everado's subsequent astute management of this property made Santa Elena the success it is today.

Culture

Santa Elena produces shade-grown coffee using sustainable growing practices, as previously mentioned. Leading by example, it has shown its neighbors, both down the road and around the world, that it is possible to run a profitable business, preserve nature and provide jobs for people from local communities. Santa Elena believes in giving back to the land as much as it takes out. Santa Elena is committed to providing its workers with a healthy living environment and a good standard of living. Its owners believe it is more than a coffee farm—it is a way of life for a community of people who care about one another, the environment, and the fruit of their collective effort: first-class 100% organic coffee.

Commitment to the Environment: Certifications

As previously mentioned, Santa Elena has been certified as a 100% organic farm since 1996. This means that its 267 hectares of land are entirely free of chemical pesticides, herbicides and fungicides. The latter are standard tools on technified, or sun-grown, coffee plantations. (The word "technified" is a direct translation of the Spanish word *tecnificado* and is now a part of the international coffee industry's vocabulary. This word first appeared in the Latin American context in reference to modernized high-yield sun-grown coffee plantations.)

Organic Crop Improvement Association (OCIA)

The farm received its first OCIA certification in December 1999 having fulfilled—and in some cases exceeded—the association's stringent requirements. Before applying for this internationally respected certification, Santa Elena underwent a rigorous three-year transitional phase. At this time every aspect of the farm's operations—from soil management to production processes—was adapted so that Santa Elena could become a fully organic farm. Some of the OCIA requirements it had to fulfil involved the following:

- Development and implementation of a conscientious soil-building program designed to enhance organic matter and encourage optimum soil health.
- Use of careful management, resistant varieties, intercropping, and maintenance of soil health as the first line of defense against weeds, pests and diseases.
- Generation of an audit trail which will permit tracing the sources and amounts of all off-farm inputs, date and place of harvest, and all steps between harvest and sale to the wholesaler, retailer or final consumer.[1]

In accordance with OCIA practices, Santa Elena [was] due for a surprise visit from independent inspectors some time in 2001 to ensure that they [continued] to meet OCIA standards. The Bernstorffs [had] no doubt they will meet the challenge.

ECO-O.K.

Santa Elena also earned the prized Rainforest Alliance ECO-O.K. seal of approval in 1999. ECO-O.K. is a certification system administered under the aegis of the Conservation Agriculture Network, and approved by the Rainforest Alliance. Its goals and objectives, complementary to Santa Elena's OCIA qualifications, place greater emphasis on the social context within which Santa Elena operates than OCIA, which concentrates more on the growing practices. Application to the process is entirely voluntary and is proof of the farm's drive for continual improvement. The certification process involves a self-diagnosis followed by an official inspection by ECO-O.K.'s independent investigators, whose costs are paid by the farm. The aims of the ECO-O.K. process are to ensure that certified farms exemplify the following values:

- Farms are part of the community.
- Farms must be productive.
- Seasonal workers must have rights.
- Consumers must do their part.
- Farms must obey all existing local and international laws.
- Farms must provide complete audits of their operations.

The ECO-O.K. certification also denotes that Santa Elena incorporates the following principles in its daily operations:

[1] *International Certification Standards,* OCIA, Section 2: Agricultural Production.

- Protection of natural ecosystems
- Conservation of woods, water and soil
- Use of shade
- Fair treatment and good conditions for all workers
- A good relationship with local communities
- Complete and integrated management of waste
- Environmental planning and monitoring

As in the case of OCIA, ECO-O.K. certification is subject to annual review by ECO-O.K.'s inspectors, who perform surprise check-ups.

Conservation of Biodiversity

The Bernstorffs are committed to protecting biodiversity on their lands while pursuing their goal of running a profitable organic coffee farm. Conservation of soil, water and biodiversity is fundamental to maintaining the health of their lands and their coffee. From the naturally replenished soils to the processing of their 100% organic coffee, Santa Elena is guided by a conservationist ethic.

Flora

Unlike technified monoculture coffee farms, all of Santa Elena's cultivated lands support diverse flora. In addition, the farm maintains a mountainous region in a fallow state that supports many different plant species, as well as wildlife. About 60 hectares in size, this area has been reforested with cedar and other varieties of trees (see Appendix A), providing local wildlife with a safe and undisturbed natural refuge.

Fauna

Santa Elena is also graced with an abundance of local residents that includes a variety of songbirds, large toads, iguanas, scores of lizards, snakes and hundreds of species of insects. In fact, there are signs of healthy animal populations of approximately forty different species comprising birds, amphibians and small mammals (see Appendix B). Up in the branches of a towering ceiba, squirrels can be seen scurrying from tree to tree, sometimes fretting noisily over a dropped nut. As night falls, a new crew of creatures emerge, each animal emitting a unique call, which sounds to a city-dweller like a car alarm atomized into its separate sounds. Set to the backdrop chorus of crickets performing their orchestral maneuvers in the dark, there are chortling toads, squeaking bamboo rats and hooting owls, to name but a few. Various species of bats also emerge with the setting sun, chasing their insect prey or feeding on the multitude of different fruit growing all over the farm's lands.

Migratory Songbirds

One of the most eye-catching and attractive features of Santa Elena is its abundant bird-life. Various birds, both local and migratory, beautify the farm with their delightful songs and elegant forms. Preening peacocks, orange-breasted titryas, mischievous uraccas—the magpie of Chiapas—and agile hummingbirds are but a few of the species that adorn Santa Elena's forested slopes. Their brilliant colors are like splashes of paint—cobalt

blue, white, carmine red, tangerine orange, parakeet green, and canary yellow—upon a canvas of green leaves. At least 17 different bird species, both local tropical birds and migratory species, are known to frequent Santa Elena. The Bernstorffs are proud of the role their lands play in providing a habitat for these birds, something that is critical for migrating species. Traditional coffee farms such as Santa Elena provide habitats for migrating songbirds, which are essential to their survival. Throughout Latin America, deforestation rates have been, and continue to be, high due to swelling human populations and modern agribusinesses like sun-coffee farms, which have no shade trees. Traditional coffee plantations like Santa Elena are islands of modified forests amid seas of deforestation. According to Chan Robbins and Alejandro Estrada, who led a team of bird surveyors around Mexico and the Caribbean Basin, of all agricultural systems in the tropics, shade coffee plantations have some of the highest numbers of migratory birds.[2]

Not ones to take their responsibilities lightly, the Bernstorffs are very protective of the birds and other wildlife at Santa Elena. As part of its commitment to protecting biodiversity, Santa Elena forbids hunting, trapping and killing of wildlife. Santa Elena also fully supports the Smithsonian Migratory Bird Center (SMBC), the organization that created the *Bird Friendly*® certification program. In October 2000 the Bernstorffs hosted a training session on their farm for a group of twenty international students seeking to become inspectors for the *Bird Friendly* program. The students spent a weekend at Santa Elena learning the skills and techniques they need to extend the reach of this valuable program throughout Latin America.

[2] See <http://www.shade-coffee.com/new/bird_friendly.asp>.

2 Sustainable Growing Practices

Organic production focuses on natural processes and how to manage them. It also involves a deliberate avoidance of synthetic chemicals. An organic farm is viewed as an ecosystem as well as a business. The emphasis that is placed on recycling, composting, soil health and biodiversity within the farm aims to protect and conserve the long-term health and productivity of the farm's environment.

Shade-grown Coffee is Sustainable Agriculture

Santa Elena's growing practices are sustainable because they give back to the land as much as they take away. Traditionally, coffee trees, known in Mexico as *cafetos*, are grown under the shade of a variety of taller trees. A diverse range of shade trees benefits the coffee trees in many ways. The leaf litter and other organic debris that accumulate on the ground increase the nutrient levels in the soil and stave off erosion. Arabica coffee trees—the kind used to produce specialty and gourmet coffee—are extremely sensitive and cannot withstand exposure to direct sunlight. If the coffee trees are grown under the healthy conditions described above and if they are cared for attentively, they won't need chemical pesticides, herbicides or fungicides. (Technified coffee farms, which grow sun-tolerant varieties of coffee, rely on the latter). And as an added benefit, coffee brewed from shade coffee beans tastes better because the coffee cherries ripen slowly and only the most mature ones are selected for processing. The canopy trees also provide habitat to a wide range of organisms that increase the overall biodiversity of the farm. In addition, many of these shade trees provide sustainable products for local consumption, such as fruit for the farm's workers and other commercially useful products. Finally, the coffee workers enjoy safer working conditions than workers on modernized coffee plantations, as they are not exposed to any pesticides.

Customers, as well as workers, appreciate these benefits. The manager of one organic food cooperative sent the Bernstorffs the following note after receiving a shipment of Santa Elena's coffee:

> *"I just want to say that I am proud to be a faithful customer of Santa Elena coffee. I get a warm fuzzy feeling when drinking, and thinking, about coffee from a company that sees—and better yet, practices, "the whole picture"…right down to recycling of packaging, and more important things like caring for employees and their families. You do us proud and offer a glimmer of hope by proving that socially conscientious businesses do exist! Thanks."*[3]

The Relationship between Shade and Coffee Trees

Coffee trees love shade and flourish under a canopy of diverse tree species. But shade, like light, has varying intensities. These different depths, or gradients of shade, are

[3] Customer testimonial from Madison coop storeowner emailed to Astrid Bernstorff, 14 December 2000.

determined by the shade trees— indigenous or introduced— that have been selected to grow with the coffee trees. A greater diversity of shade trees provides varied levels of shade, which increases the farm's biodiversity and improves the health of the coffee trees.

Like a natural forest, Santa Elena has three distinct levels of shade. The canopy, or overstory, ranges from 12 to 15 meters, the middle level ranges from 4 to 6 meters and the lower level, that of the *cafeto* itself, is between 1 and 1.5 meters.[4]

The shade spectrum, or gradient of shade, visible throughout the farm is managed according to a combination of rustic and traditional polyculture methods, using a five-category shade-management spectrum developed by Mexican coffee researchers and technicians.[5] (See Appendix C.) Under this system the coffee trees are planted under the shade of indigenous species such as *Inga*. The natural canopy is preserved as much as possible by favoring and encouraging the growth of certain trees in whose presence coffee trees flourish. Other trees that are less conducive to the coffee trees' growth are cut down and used as fertilizer. Workers, using only hand tools such as machetes, do all work on the trees.

Each hectare at Santa Elena contains a minimum of 300 indigenous and introduced shade trees and 2000 *cafetos*. Every year, about 12,000 new shade trees and 7, 250 new *cafetos* are planted throughout the farm. (See Appendices D and E.)

Life Cycle of a Coffee Tree at Santa Elena

The coffee tree, or *cafeto*, begins its life as a seedling planted in a bed of organically fertilized soil under the shade of a bamboo-thatched roof a meter high. The seeds—known as coffee beans when processed—are selected from the previous year's best cherries. As the baby *cafeto* rises up on its frail green stalk, these two beans look like halves of a helmet, which is why the *cafeto* is known as a *soldado*, a little soldier, at this stage. Once it sprouts its first pair of leaves it becomes known as a *mariposa*, the Spanish word for butterfly. With these new wings, they are ready for their first transplanting.

Each *mariposa* is transplanted into polybags made of black diothene (200-gauge) filled with a mixture of organically fertilized soil and moved into the larger tree-nursery or *almácigo*. There, pairs of transplanted *mariposas* are arranged in rows between rows of shade trees (mainly a variety of *Inga*) that are also seeded in the tree nursery. Throughout their first year, the baby *cafetos* are left to mature in the nursery. When the trees reach a height of 20-40 cm, normally by the end of their first year, they are planted throughout the farm according to the agricultural plan for that year.

At the end of the third or fourth year the *cafeto* will flower for the first time and then later that year yield its first cherries. Its yields will increase each year until its sixth-to-eighth year when it comes to maturity. The Arabica varieties grown at Santa Elena yield one

[4] Luis B. Gaitán González (Rainforest Alliance inspector, executive director FIIT), Nora Alvarez and Lucia Jurado de Morales, *1999 Eco-Ok Report on Santa Elena.*
[5] David L. Gorsline and Jennifer McLean at http://www.coffeeresearch.org/politics/birdsafe.htm

harvest a year, ripening after six or eight months over a period of eight weeks. Once ripe, the cherries must be harvested immediately. A cherry at optimal ripeness is bright red in colour. A well-cared for tree grown under ideal conditions will have an economic life of 20 to 25 years. Though the trees can live much longer, their productivity declines with each passing year after this point and they become increasingly susceptible to disease. Trees past their prime have a detrimental effect on the land, causing soil exhaustion and finally, erosion as their roots weaken. Before the trees reach this stage they will be uprooted and composted, to return to the land in the form of fertilizer for the following year's crop.

Water Management

Throughout the farm there are small springs and creeks extending from two main rivers that cross the farm from north to south, and south to west, respectively. Six kilometers of piping has also been laid across the farm to transport water from the rivers to all the farm residences, including the family home and the mill house. Santa Elena also supplies its own electricity from two river-powered turbines built in 1902.

The farm's rivers are protected from erosion and contamination by a 10-meter absorption area on either bank that is left in a totally natural state These zones also serve as corridors of untouched land for wildlife.

Water used in the wet process of the mill house is recycled throughout the day. At the end of the day, the used water passes through a natural filter of stone, gravel and sand and filters down to the rivers below through a system of zigzagging canals. Santa Elena plans to build a modern water treatment facility in the near future.

Soil Management

Composition

The National Association of Coffee in Guatemala (*Asociación Nacional del Café*— Anacafe) analyses the composition of the soil at Santa Elena once a year to ensure optimal levels of fertility are maintained. Measurements of the following are sought: potassium, phosphorous, calcium, magnesium, aluminum, copper, iron, zinc, acidity, and percentage of organic matter.

Erosion Control

Every year during the dry season (from January to April) machete-wielding farm workers trim the branches of the shade trees and cut away the less productive branches of the *cafetos*. These branches are then spread out on the ground and allowed to decompose naturally, returning their nutrients to the soil. This ground cover also serves to preserve the humidity of the soil and prevent erosion. Other protective measures used are the sowing of grasses and, on the borders of fields, lines of trees known as izotes (*zacate vetiver)*. These trees serve as living barriers to protect against water erosion.

Management of Organic Fertilizers

Each year organic compost produced at Santa Elena is applied to the soil to enhance its fertility. The compost is applied evenly at an average rate of 1,711 kilograms per hectare throughout the farm during the summer months (from May through to September inclusive). (See Appendix F.)

Waste Management

Nonrecyclable waste from residences and production processes is disposed of in sealed containers buried in the ground. Wastewater from bathrooms empties into septic tanks.

Agricultural Problems and Solutions

Like all farms, Santa Elena must occasionally deal with pests and diseases. The two most common agricultural problems are a small parasitic worm that enters the coffee cherry, known as *broca*, and a fungus that defoliates coffee trees, known as coffee leaf rust, or *la roya*. Both problems are solved using only organic methods. Coffee trees infected with *broca* are treated with a garlic extract, while the infected cherries are boiled to kill the worm inside. Coffee leaf rust is treated by regulating the shade cover on the affected trees and by spraying the leaves of the coffee trees with a copper-based compound.

Effects of Neighboring Farms

The farm is bordered by San Juan Chicharras to the north, Guanajuato and Ejido el Eden Fraccionamiento Santa Elena to the east, Sta. Alicia to the south, and another section of Ejido el Eden in the west. As all the neighbouring farms are also producing organic coffee, there is no risk of contamination to Santa Elena. (See Appendices G and H.)

3 Good Coffee

Although coffee is the second-most-traded commodity after petroleum, the coffee grown at Santa Elena is a world apart from the low-grade generic coffee bought and sold en masse on the New York "C" market. Much like an estate wine, Santa Elena's coffee carries with it a reputation founded on the Bernstorffs' experience in producing high-quality 100% organic coffee.

Interview with Everardo Bernstorff Pérez

Occupation: Owner, visionary

Everardo Bernstorff is a hard-working, generous and good-natured man. Husband to Enriquetta, father of two and grandfather to one, he appears much younger than his years (He attributes this to a life of working and eating simple, wholesome foods like beans and tortillas.) He has been managing farms his whole life and he is well known and well respected throughout the local community in Tapachula, Chiapas. Santa Elena owes much of its success to his business acumen. Although by nature a serious man, Bernstorff also has a wonderful sense of humor. When asked how many cafetos *are planted at Santa Elena, he pauses to think about it, then replies,* "Unos, dos, tres…muchos, muchos árboles" *(One, two, three ... many, many trees). The following is his own account of why he decided to make Santa Elena a 100% organic coffee farm:*

"I chose to turn Santa Elena into an organic farm because I was worried that when it came time for me to pass Santa Elena on to my children it would be less productive than it was when I first began here. And if my grandson, Felipe, wanted to take it over in the future, why, by that time the soil might not be able to grow much of anything anymore.

"I love this area. I love Chiapas—the land, the climate and the lushness of these forests, where I used to play as a boy. When I was young, I remember these trees were full of birds, and throughout my life I have always loved to hear them singing in the morning and in the evenings when my work is done. I always knew these birds belonged here and were a part of this place, long before I knew about the Smithsonian's *Bird Friendly* project for migrating tropical birds. I know that the lands here are an oasis for these beautiful travellers, and I want to make sure that there will always be a place for them on the little part of the world that I care for.

"Finally, I began to realize that the only way to achieve these goals would be through higher profits. Santa Elena is a part of the international coffee community and we have always been tied to the international markets, *la bolsa*, which is no friend of ours. I knew that I had to find a way to gain some control over the price of the *café de oro* we produce here or we would not survive, as has happened to many other farms in this region. And when a farm goes, it takes with it not only its owners, but also the whole community of workers and people who depended on the farm for employment. And that speaks nothing about the end of a tradition and in many real ways, the end of a way of life. I have seen that happen, and it is one of my driving passions to make sure that doesn't happen to

Santa Elena. The organic coffee we grow here is of a very high quality, the kind of speciality coffee that today's consumers ask for all around the world. Because of this growing demand for products that are grown using natural methods and not exposed to any chemicals, our coffee can be sold at a premium. This premium price then covers our costs and allows us to give our workers' better wages and grow at the land's pace, rather than at a rate accelerated by chemicals. I believe the future of the coffee industry, not just here but around the world, lies in producing a quality product rather than a basic commodity. Only organic, traditional methods, like those we have adopted here, will sustain this in the long run. Our vision, our beliefs, our whole way of life depends on it."

Cultivars

Three varieties of Arabica *cafetos* are grown in the following distribution: Bourbon (70%), Catuhaí (20%) and Catimor (10%). (See Appendix I.) In the crop year 2000, Santa Elena produced 61,200 kilograms of green coffee for export. In addition to producing coffee, these trees are also major sources of oxygen. A hectare of coffee produces 86 pounds of oxygen daily—about half the production of the same area in a rain forest.[6]

Classification

Santa Elena produces premium-quality fully washed green coffee, which falls under the *Other Milds Arabica* classification according to international standards

Taste Characteristics

When brewed, Santa Elena coffee should have a soft aroma, with a smooth, mild, nutty flavor. Shade coffee has a richer flavor than sun-grown coffee because the slower ripening stage results in a higher concentration of sugars in the coffee cherry.

Processing

The coffee cherries at Santa Elena undergo a series of selections and transformations. This begins when the picker selects only the ripest cherry to bring in for processing. To ensure optimal quality, the cherries are pulped and processed immediately after being picked. All machines and fermentation tanks used in the wet and dry mills are kept meticulously clean and in good working order. The final color selection is once again made by hand, according to strict in-house standards and under the active guidance of the mill-house manager, Pascual Velázquez, and Everardo. There is simply no other way to provide first-class coffee. Bean by bean, workers meticulously separate out immature, black or diseased beans, known as *desperdicios,* leaving only the best-quality mature beans for export.

Mill-house Operations

Ten years ago, Everardo reorganized his mill-house operation to make it more efficient and less labor-intensive. Compared with other farms of equal size, the mill house at Santa

[6] See <http://www.coffeeresearch.org/agriculture/varietals.htm>.

Elena is extremely compact and requires at most six workers, but often only four, to run at optimal levels. All machines are dismantled after the harvest for a complete cleaning.

The farm has both a wet and a dry mill house with the following equipment:

Wet Mill House	Dry Mill House
Reception area for cherries with two siphons that can accommodate 500 *cajas*: 30 tons of coffee cherries each	Two static dryers
Four pulpers (machines for removing outer skin of cherries) and one repasser (machine for washing parchment coffee beans)	Three vertical dryers
Four fermentation tanks for parchment coffee beans and one tank for *floaters* (abnormally light beans)	Two *guardiolas* (horizontal dryers)

Wet Process

Wet-processing coffee involves the removal of the layers surrounding the coffee bean. The resulting coffee is cleaner, brighter and fruitier.[7] At Santa Elena, the wet process begins when the fresh cherries are brought down from the fields and poured into the two external siphons for an initial density sort. Higher-quality beans are dense and sink to the bottom. The lighter beans, or floaters, are separated out of the siphons and processed separately for lower-grade coffee. From there the beans pass through tubes to the pulper machines inside, where the outer skin and sap is cleaned off the bean. These pulpers are intricate devices that neatly separate the flesh of the fruit while leaving the bean intact in its parchment or bran envelope. Using pressure, the pulpers force the ripe cherries through an aluminum screen with holes large enough for a coffee bean to pass through but not the entire cherry.

The pulped skins are suctioned out of the mill house and carried in water through a plastic tube to a deposit area outside, where an open-backed truck is waiting. When the truck is full, it carries the nitrogen-rich pulp to the compost area, where it is left to compost for the remainder of the year.

After pulping, the beans still retain a thin layer of mucilage, consisting of pectin and sugars, which must be cleaned off in the fermentation tanks where they are left to ferment for a period of 20 to 23 hours. In the tanks, another density separation occurs. The highest-quality dense beans are again separated from the lighter beans and fermented in a separate tank. (The farm is also equipped with a machine washer that is used in periods of low production, such as at the very beginning and end of the harvest. This washing process is quick and efficient, though some buyers prefer fermented coffee). At this stage, the coffee beans are known as *pergamino,* or parchment coffee because they are still contained in their inner bran envelope. Wet parchment coffee generally retains about 50

[7] See <http://www.coffeeresearch.org/agriculture/flavor.htm>.

percent humidity level, which must be brought down to 11 percent using a system of dryers.

Dry Process

From the fermentation tanks, the washed beans are sent to the predryers (three vertical dryers). The beans are left in the predryers for 10 hours. From the predryers the beans are sent to the *guardiolas*, horizontal cylindrical dryers, where they are kept for approximately eight hours at a constant temperature of 60° Celsius. The drying time varies according to the batch and is determined by a skilled technician who monitors the level of humidity in the beans. These dryers are fueled by gas and diesel. Beans are kept in their parchment until they are ready to be shipped in order to preserve flavor and aroma. When an export order is received, the dried parchment beans are processed in a warehouse room next to the wet-processing area.

This stage of processing is the most important. Here the parchment coffee undergoes a final density sort. The *pergamino* passes through a series of pneumatic tubes that shake the beans loose from their parchment husks, sorting out the lighter beans such as *caracoles* (see boxed text below) the denser ones. The removed husk, or parchment, is known as *cascabillo*. It is siphoned off to a deposit outside the mill house to be used as compost. The coffee beans then end up on a densimetric table. This machine is basically a vibrating platform that shifts the lighter beans to one side and the heavier high-quality beans to the other. The final output is *café de oro*, which is bagged and carried to a connecting room for the final step in processing. There, each bag is emptied and the beans are color-sorted by hand. The final product is then bagged in new 60-kilogram jute bags, which are made in Guatemala, imprinted with Santa Elena's business number, the lot number of the order, and the words "Organic, ECO-O.K., Product of Mexico." At this stage the *café de oro* is ready for export.

Caracoles

Caracol means "snail" in Spanish, and the coffee beans that fall into this category are named after this mollusc because they look like the small shells that snails found on the nearby Soconusco Coast live in. These coffee beans are dryer than the beans selected for *café de oro*. Having a lower percentage of their weight in humidity causes the beans to curl inwards, giving them their characteristic shape, size and weight. These small beans are threshed out of the mix during the processing of *café de oro* in the dry warehouse, at which time they fall through a screen specifically designed for this purpose.

Storage

Like all quality coffee, Santa Elena's coffee is not kept in storage for very long. But some storage is necessary while an order is being completed. The *café de oro* is stored in the dry mill house where it is processed. The dry mill house is a single-roomed open warehouse with a smooth cement floor. During the day, some natural light enters through a narrow row of windows near the roof. As Santa Elena produces nothing but its own

organic coffee, there are no risks of the coffee being exposed to any other products that could adversely affect its flavor. When the order is complete, the coffee is exported directly from the farm to the border or port.

4 Santa Elena's Commitment to People

Direct Benefits to Coffee Workers

In a state where more than half the homes have neither running water nor electricity, Santa Elena is committed to ensuring a good quality of life for its workers. The farm has recently raised the daily wage for its field workers so that it is now more than double the legal minimum wage in Mexico. Tending to shade-grown coffee trees is not easy work, but over the years the Bernstorffs have made constant efforts to improve the lives of their workers wherever possible. Some of the benefits Santa workers receive are the following:

- Wages above the industry average.
- Medical services. Between harvests, workers are taken to Tapachula for medical attention as needed. During the harvest season, all workers on the farm have free access to doctors and social workers that make bi-monthly visits.
- Food supplements for their children. The children are given *atole*, a nutritious porridge in milk, sweetened with cinnamon.
- Interest-free loans. Workers who need financing for start-up costs on their own lands (about 20 percent of the harvest staff) receive these. Without these loans, these workers would have little recourse to financing. These loans are paid back through deductions at source during Santa Elena's harvest. The repayment is amortized throughout the harvest season so that the worker only pays an affordable portion per paycheck.
- A healthy, chemical-free living and working environment.
- Free housing equipped with gas stoves, electricity, running water (hot and cold).
- A worker-run general store conveniently located on the farm, which saves workers from having to travel 27.5 kilometers into town to purchase supplies.

Future developments will include the following:

- A daycare center for workers' children.
- New housing developments for seasonal workers.

Background Information about Workers

Santa Elena has both permanent and seasonal workers. The number of seasonal workers hired each year fluctuates according to the size of the crop. Most of Santa Elena's permanent and seasonal workers come from local villages in nearby Guatemala. These workers are familiar with Santa Elena either as a result of previous experience, or of having heard one of the farm's radio ads calling for workers. These brief ads state the wages the farm offers and the number of men and women required to meet its current needs. Interested applicants meet with one of the farm's representatives in their

hometown. Once a person is hired, Santa Elena assumes the responsibility of transporting the worker to the farm and handles the necessary paperwork for the border crossing. Most workers retain a strong loyalty to their hometowns and nearly all return during slower periods of the year or, in the case of permanent workers, upon retirement.

A Day in the Life of a Farm Worker

At Santa Elena, the morning sky brightens to the sound of birds trilling. A rooster crows, a dog barks. It is 6:00 am. After rising, workers eat a warm breakfast of fresh tortillas, black beans and coffee. Then they head out to their various tasks. During the harvest months, between September and December, hundreds of men and women head out to the slopes with their families to pick the finest of the dark red and purple coffee cherries. In January, following the harvest, a smaller workforce, composed of 50 men and women, begins preparing the trees for next year's harvest.

In winter, there is still plenty of work to be done: in the tree nursery, there are baby *cafetos* sprouting under the protective shade of a thatched bamboo roof. Here, men and women work on seeding the new trees for the next year. Out on the slopes where the *cafetos* are grown, men work in teams, chopping, clearing and cutting away the lower branches of shade trees to increase the shade and make room for the *cafetos* to grow. The farm's agronomist will ensure that these chopped branches are used to protect and conserve the soil throughout the farm.

Close to the family home, recently harvested coffee is prepared in the mill house to fulfill an export order. In a nearby room, a team of workers deftly sorts through the green coffee beans and removes any blackened or wizened beans that have made it through the processing.

The workday ends at 2:00 p.m., when most workers return to the cafeteria for a lunch of tortillas, beans and coffee. The afternoon birds will soon be out flitting through the forest shadows. Nightfall will bring a twilight chorus as the workers return to their homes to spend time with their families or meet to play music, talk and relax.

Working Conditions

The workweek is from Monday to Saturday inclusive. The eight-hour workday runs from 6:00 a.m. to 2:00 p.m. All employees get two weeks off a year, as well as a handful of legal holidays during the year. In addition to these holidays, permanent employees (including office staff) receive additional vacation time depending on how long they have been with the farm. (See Appendix J.)

Pre- and Post-harvest Activities

Although the harvest is the most exciting and busiest time of the year for any farm, many other important types of jobs must be done throughout the year to prepare for a good harvest. For these jobs Santa Elena retains a permanent staff of approximately 50

workers. Listed below are the main pre- and post-harvest jobs and the time of year during which they are completed:

- Pruning and shade management (*chaporro, desombra*): three to four times a year.
- Trimming away branches from the *cafetos* to increase the quality of the cherries on the remaining branches (*poda* and *deshije*): February and March.
- Collection and planting of shade tree seeds in tree nursery: February and March.
- Growing of *cafetos* and shade trees in the tree-nursery: year round.
- Production and composting of organic fertilizer: ongoing, one-year cycle.

Harvest

The harvest season at Santa Elena lasts for roughly three months, beginning in late September or early October and running until mid-December. This is by far the busiest time of the year, and it is during this period that the farm hires the majority of its workers. Workers, who are paid by the amount of coffee cherries they pick rather than a daily wage as at other times of the year, pick only the ripest cherries, using a method known as "selective picking." These cherries are carried in baskets made of woven bamboo (handmade on the farm each year) to a weighing station, known as a *recibidero*. This station functions as a large wooden funnel in which the workers' loads are measured for the day. Bags are placed at the bottom end of the funnel. At the end of the day these bags full of ripe cherries are brought to the mill house, where they are immediately processed.

Methods of Payment

As previously mentioned, workers at Santa Elena are paid generous wages—more than twice the minimum requirement set by Mexican law. During pre- and post-harvest season, workers earn a daily wage, which is determined by the nature of the job. For example, workers on tree-pruning duty earn 42 pesos per day. Breakfast and lunch are available to workers for 7 pesos a day (a preferential price) in pre- and post-harvest season. During harvest time, all meals are free for workers and their families, a practice that exceeds existing industry norms. (The menu is changed weekly to include fish, chicken or beef at least once a week.) Workers earn a fixed price of 44 pesos for every 68-kilogram bag (known as a *caja*) that they fill. (See Appendix K.)

Accommodations

Permanent employees and seasonal employees receive different types of accommodations. Permanent employees live in simple small houses. Long-term seasonal employees (up to six months) live in subdivided row houses, known as *ranchos*. Workers in for the harvest (up to three months) bunk in communal dorms, known as *galeras*.

Housing

There are three stand-alone houses for the families of the permanent production staff, each with a private bathroom and shower area.

Ranchos

There are a total of 30 *ranchos*. The design of these row houses is basic and clean. The buildings consist of concrete blocks with cement floors and corrugated aluminum The

majority of the *ranchos* are subdivided into two-room homes. The simpler *ranchos* have one room and are reserved for single workers without families. In the common areas between homes are bathrooms, showers and water tanks for washing clothes.

Galeras

Galeras are long one-room row houses, with most of the room occupied by wooden bunk beds. There are three large *galeras* and five smaller ones. The harvest workers bunk here for the night.

Glossary

Abano orgánico: Organic compost.

Almácigo: Seedlings (new coffee and shade trees sprouted in the nursery) Also used: *semillero*

Cafeto: Coffee tree or coffee shrub.

Café verde: Green coffee. Also known as ***café de oro*** or ***café sin tostar*.**

Caja: 68-kg bag of coffee cherries.

Cajete: Clearing the ground around a newly planted coffee shrub to give it space to grow.

Cascabillo: The parchment, or bran inner envelope, of the coffee cherry. Removed during processing.

Chaporro: Cleaning or clearing an area for new trees to grow; cutting away dead shade trees.

Cosecha: Harvest, when the coffee cherries are handpicked.

Coyotes: Local buyers who travel the roads between farms and *ejidos* at the end of the day offering low, often exploitative prices, for bags of coffee cherries to *ejidatarios* [see definition below] in need of cash.

Deshijar: Trimming away of lesser branches on *cafetos* to increase the quality of cherries on remaining branches

Desombra: The process of cutting away the lower branches of shade trees to raise the level from which shade is cast.

Ejidatario: A worker or owner of an *ejido*. (See Appendix H. Also known as a *parcelero*.)

Floaters: Light coffee beans, separated from denser higher-quality coffee during initial density sorting

Galera: A dormitory comprising one open room with bunk beds.

Guardiolas: Horizontal, cylindrical-shaped dryers used to bring coffee beans humidity levels down from 50 percent to 11 percent.

Grano vano: A bad coffee bean. Usually due to a parasite that has created tunnels inside the bean. Also known as a floater.

Mariposa: Coffee bean that has sprouted two leaves that look like small butterfly wings.

Pante: Section of farm defined by having similar characteristics, e.g. mountainous. There are ten at Santa Elena of varying size. (See Appendix D.)

Pergamino, or **parchment,** coffee: The name for the coffee bean after it has passed through the wet-process but before it has been prepared for export. Refers to the inner shell of the coffee bean that remains after the outer husk is removed by the pulpers.

Ranchos: Individual living units. Either stand-alone houses or subdivisions of row housing.

Roya: Coffee leaf rust, a fungus that attacks coffee leaves.

Soldados: Name for newly seeded coffee beans before the first leaves bloom.

Sombra: Shade.

Tapiscar: To pick, gather, harvest.

Technified coffee farm: Derived from the Spanish word *tecnificado*, referring to modernized coffee plantations that cultivate sun-grown coffee.

Unwashed beans: Typically of the Robusta variety; coffee beans that are dried immediately after being picked. The dried husk is removed later. This process gives Robusta coffee a stronger flavor.

Washed beans: Coffee beans that have gone through the wet process before being dried.

Sources

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Personal Interviews

Everardo Bernstorff Pérez, owner and manager, Finca Santa Elena.
Astrid Bernstorff, president, Santa Elena Coffee Company.
Ingeniero Bernardo Gamboa Ochoa, agronomist, Finca Santa Elena.
Pascual Velázquez Gómez, mill-house manager, Finca Santa Elena.
Flor de María Fuentes Ruiz, administrator, Finca Santa Elena.

Useful Web Sites:

Web site for Stock, Options and Futures Traders <www.ino.com>
Specialty Coffee Association of America <www.scaa.org>
International Coffee Organization <www.ico.org>
Specialty Coffee Institute <www.coffeeinstitute.org>
Coffee Research Institute <www.coffeeresearch.org>
Asociación Nacional del Café <www.Anacafe.org>
Café Canopy <www.shade-coffee.com>
International Trade Data System <www.itds.treas.gov>
United States Department of Agriculture: Foreign Agricultural Service <http://ffas.usda.gov>
Rural and Agricultural Incomes with a Sustainable Environment <www.raise.org/links/coffee>

Transfair Canada <www.transfair.ca>
Smithsonian National Zoological Park <www.natzoo.si.edu>. With links to: Smithsonian Institute and Migratory Bird Center.

Appendix A: Shade Trees

The predominant species of shade trees found throughout the farm are cedar, *primavera* and varieties of the *Inga* species. There are also numerous species of fruit trees such as mango, breadfruit, *guayabo*, *chalum*, *guagua*, *paterna*, and *caspirol*, orange, lemon, lime and avocado.

The table below shows the 30 most common species of shade trees that grow at Santa Elena.

Common SPANISH Name	**Scientific (LATIN)**	**Common SPANISH Name**	**Scientific (LATIN)**
Madre Cacao	*Gliricidia sepium*	Guarumbo	*Cecropia* sp
Primavera	*Cybastax Donnell-Smithii*	Ingas	*Inga* sp
Cacao volodar	*Inga* sp	Paterna	*Inga* sp
Posol	Unidentified	Guayabo volador	*Psidium* sp
Cinco negritos	Unidentified	Hormigo	*Platymiscium dimorphandrum*
Canaco	Unidentified	Chicharro	*Quercus* sp
Pacaya	Unidentified	Banano	*Musa* sp
Mango	*Mangifera indica*	Naranja	*Citrus cinensis*
Limón	*Citrus* sp	Cedro	*Cedrela pacayana*
Chiche	Unidentified	Caoba	*Swietenia humilis*
Trompillo	Unidentified	Aguacate	*Persea* sp
Pomarosa	*Eugenia jambos*	Llama del bosque	*Spathodea campanulata*
Arbol de Pan		Flamboyan	*Delonyx regia*
Palo jiote	*Bursera simaruba*	Cuernavaca	*Solanum bansii*
Guanacaste	*Enterolobium* sp	Ceiba	*Ceiba pentandra*

Source: Ing. Bernardo Gamboa in *1999 Eco-OK Report on Santa Elena*.

Appendix B: Fauna

BIRDS

ENGLISH*	SPANISH	SCIENTIFIC (LATIN)
White-fronted parrot	Loro frentiblanco	*Amazona albifrons*
Orange-fronted parakeet	Perico	*Aratinga canicularis*
	Chocoyo	*Aratinga strenua*
Emerald toucanet	Tucaneta	*Aulacorhynchus prasinus*
Orange-chinned (Tovi) parakeet	Señorita	*Brotogeris jugularis*
Black-throated magpie jay	Urraca	*Calocitta formosa colliei*
Giant wren	Matraca chiapaneca	*Campylorhynchus chiapensis*
Rufus-naped wren	Matraca nuquirrufa	*Campyloryhnchus rufinucha*
Crested caracara	Caracara	*Caracara plancus*
Black vulture	Zopilote	*Coragyps atratus*
Groove-billed ani	Pijuy	*Crotophaga sulcirostris*
Social (vermillion-crowned) flycatcher	Chepito	*Myiozetetes similis*
White-bellied chachalaca	Chacha	*Ortalis leucogastra*
Great kiskadee (Kiskadee flycatcher)	Chepito	*Pitangus sulphuratus*
	Zanate mayor	*Quiscalus mexicanus*
White-collared swift	Vencejo cuelliblanco	*Streptoprocne zonaris*
Masked titrya	Titira enmascarada	*Titrya semifasciata*

Source: Ing. Bernardo Gamboa in Máximo Hernandez Martinez's *1999 Eco-OK Report on Santa Elena.*
* From Roger Tory Peterson and Edward L. Chalif, *Mexican Birds: Peterson Field Guides* (Boston: Houghton Mifflin Company, 1973).

MAMMALS

SPANISH	**SCIENTIFIC (LATIN)**
Puercoespín	*Coendou sp*
Cuatuza	*Dasyprocta punctata*
Armadillo	*Dasypus novemcinctus*
Tlacuache	*Didelphys marsupialis*
Ocelote	*Felis pardalis*
Margay	*Feliz wiedii*
Huitzitzil	*Mazama americana*
Comadreja	*Mustela frenata*
Pizote	*Nasua nasua*
Taltuza	*Orthogeomys sp*
Mapache	*Procyon lotor*
Oso colmenero	*Tamandua mexicana*
Coche de monte	*Tayassu tajacu*

AMPHIBIANS

SPANISH	**SCIENTIFIC (LATIN)**
Rana	*Leptodactylus* sp.
Sapo	*Bufo marinus*
Sapo	*Bufo valliceps*
Tapalcúa	*Dermophis mexicanus*

Appendix C: Shade-Management Criteria

Mexican researchers and technicians have developed a five-category classification of shade-management techniques found on all coffee farms. The following list, provided by coffee researchers David L. Gorsline and Jennifer McLean on the Coffee Research Institute's web site <http://www.coffeeresearch.org/politics/birdsafe.htm> summarizes the major features of these five categories:

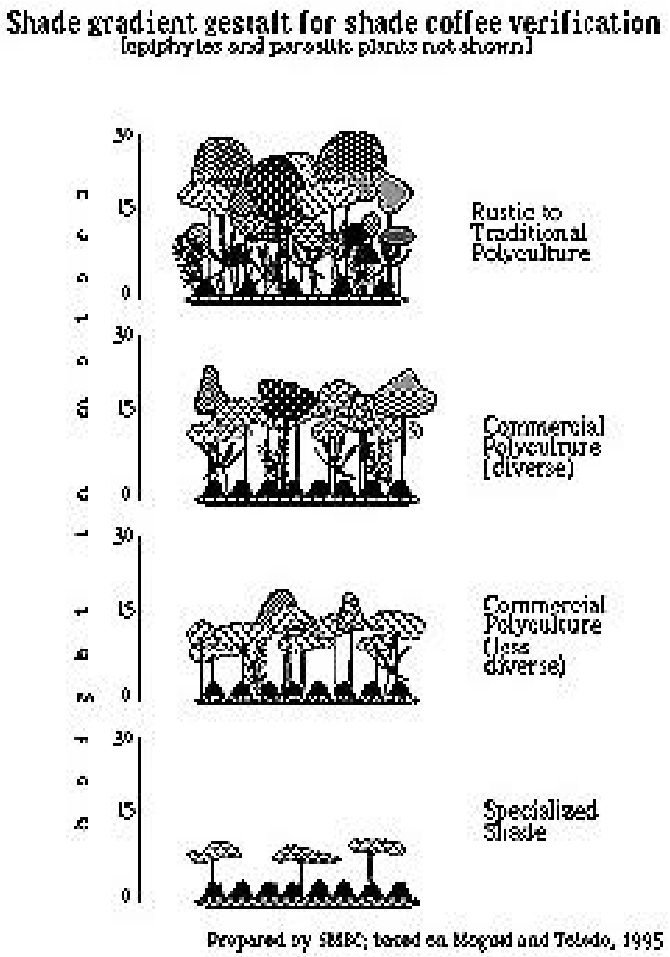
1. **Rustic** (*rusticano*): the least intensified (and increasingly rare) practice; coffee shrubs are planted in the existing forest with little alteration of native vegetation; also the least expensive practice, typically used by small family-owned farms that produce a modest crop of coffee.

2. **Traditional polyculture** (*policultura tradicional*): more managed than rustic coffee, involving deliberate integration of beneficial plants (fruits, vegetables, nuts, medicinal plants, etc.), and resulting in greater species diversity than commercial polyculture (below); the crop diversification helps farmers in years when coffee prices are depressed; in many traditional indigenous systems there is no distinction between wild and domesticated plants and some plants are weeded, tolerated, or encouraged depending on household needs and the season.

3. **Commercial polyculture** (*policultura comercial*): similar to traditional polyculture, but some shade is removed to make room for more coffee shrubs; yields are higher, but some agrochemical inputs (fertilizers, pesticides) are usually needed; generally planted with a distinct backbone species, but more diverse than specialized shade (below).

4. **Reduced, or specialized shade** (*sombra especializada*): uses a single, pruned canopy species to provide shade, typically from the genera *Inga, Erythrina, Gliricidia*, or *Grevillea*; coffee shrubs are planted more densely, and the farm has a manicured look; since the overstory consists of one or two species, its vertical structural diversity is reduced.

5. **Full-sun, or unshaded monoculture** (*monocultura sin sombre*): does away with the canopy completely; the unshaded intensively managed fields are highly productive if given the requisite agrochemical inputs; farms such as these have one objective: producing coffee for market.



Source: SMBC Shade Management Criteria at <www.natzoo.si.edu/smbc/coffee/criteria>

Appendix D: *Pantes*

Name of *pante*		**Area in Hectares**
1.	Galeras	40.38
2.	Carmen Uno	21.06
3.	San Ramon	24.81
4.	Carmen Dos	50.38
5.	San Fernando	36.38
6.	Dos Rios	28.88
7.	Rio Grande	42.81
8.	San Antonio	31.35
9.	El Rincón	6.63
10.	El Mango	9.13
TOTAL		**291.71**

Source: Ing. Bernardo Gamboa Ochoa in Máximo Hernandez Martinez's (OCIA inspector) *1999 Report on Santa Elena.*

Notes: Total *cafetos* (coffee trees) planted: 10,784

Total shade trees (*Inga* species: *guagua, chalum, paterna*) planted: 7,225

Appendix E: Wood and Fruit Tree Distribution

PANTE	Chiche	Chicherro	Pomarrosa	Guayabo	Copalchi	Arbol de Pan	Aguacate	Albarique	Macadamia	Otate	Guanacastle	Canelo
1.	36	12		75	22			3			110	
2.		10	18	20	15	10	7	2	1	10		25
3.	10	15	30	48							95	
4.	10	10	74	20		22		1			40	
5.	20	5	40	30							64	
6.	15	5	15	15	15						15	
7.		5									180	
8.	159	13				2						
9.	137	8										
10.	94	9										
Total	481	92	177	208	52	34	7	6	1	10	504	25

Source: Ing. Bernardo Gamboa Ochoa in Máximo Hernandez Martinez's (OCIA inspector) *1999 Report on Santa Elena.*

Appendix F: Organic Compost

MATERIAL	AMOUNT in kg
Dolomitic lime	3,628
Banana tree husks	3,628
Chalum branches	908
Phosphorous	908
Lime hydrate	2,722
Bamboo branches	908
Cattle manure	580,580
Sugar cane bark	76,200
Coconut bark	43,544
Coffee cherry pulp	86,181
Total Materials	**799,207**
Total Compost	**453,585**

Source: Ing. Bernardo Gamboa Ochoa in Máximo Hernandez Martinez's (OCIA Inspector) *1999 Report on Santa Elena.*

The vegetable matter used in the production of compost is taken directly from the farm. The local market in Tapachula provides the dolomitic lime**,** lime hydrate and phosphorous. The cattle manure is bought from a cattle ranch near the coast. The coconut and sugar cane husks are brought in from a farm growing African palm trees on the coast, which is also owned and operated by Everardo Bernstorff Pérez.

Appendix G: Map of Chiapas

The 267-hectare Santa Elena farm is located in the lush hills of the Sierra Madre de Chiapas, close to the city of Tapachula in the far southern point of Chiapas.

Appendix H: *Ejidos*

Ejidos were first established by the Spanish during the colonial era. The native Indians did not have a tradition of land ownership *per se*. Prior to the arrival of the Spaniards the local tribe worked the land distributing the produce to its members—and to the prevailing dominant tribes to whom tribute may have been owed or demanded. Originally, *ejidos* were large plots of land owned communally by a village or pueblo. These plots are now divided into small 5- to 10-hectare pieces, each individually managed by an *ejidatario* (a person who lives and works on an *ejido*) or *campesino* family. Today, *ejidos* comprise 55 percent of the cultivated land in Mexico.[8]

There are many benefits to such a system in terms of land distribution, but one of the persistent challenges facing *ejidatarios* throughout Mexico is quality control. With so many different suppliers and so many varying levels of quality to control, it is very difficult to provide a consistent product—a fact that has hurt Mexico's image in the past as a producer of quality coffee.

[8] See <www.britannica.com>.

Appendix I: Cultivars

C. Arabic "cultivar *Arabica*" (includes var. *typica*) and C. *arabica* var. *bourbon* are considered to be the first cultivars[9] from which all others are derived.

Typica—This is the base from which many coffee cultivars have been developed. Like the other Arabica cultivars that have been developed from it, Typica plants have a conical silhouette with one main vertical trunk and secondary verticals that grow at a slight slant. Typica is a tall plant reaching 3.5–4 m in height. The lateral branches form 50–70° angles with the vertical stem. Typica has a very low production, but has an excellent cup quality.

Bourbon—Named after the island of the same name, it was brought to the Americas by the French. Bourbon produces 20–30% more coffee than Typica, but less coffee than most cultivars. It has less of a conical shape than Typica, but has more secondary branches. The angles between the secondary branches and the main stem are smaller, and the branch points on the main stem are closely spaced. The leaves are broad and wavy on the edges. The fruit is relatively small and dense. The cherries mature quickly and are at a risk of falling off during high winds or rains.…Cup quality is excellent and similar to Typica.

Catuai—Catuai is a high yielding plant resulting from a cross between Mundo Novo and Caturra. The plant is relatively short, and the lateral branches form close angles with the primary branches. The fruit does not fall off the branch easily, which is favorable with areas with strong winds or rain. Catuai also needs sufficient fertilization and care.

Catimor—Catimor is a cross between Timor (resistant to rust) and Caturra, created in Portugal in 1959. Maturation is early and production is very high with yields equal to or greater than the yield of other commercial cultivars. For this reason the method of fertilization and shade must be monitored very closely. The Catimor T-8667 descendants are relatively small in stature, but have large fruits and seeds. The Catimor line T-5269 is strong and adapts will to lower regions between 2,000-3,000 feet with annual rainfall over 3,000 mm. T-5175 is very productive and robust, but can have problems at either very high or very low altitudes. At low altitudes there is almost no difference in cup quality between Catimor and the other commercial cultivars, but at elevations greater than 4,000 feet, Bourbon, Caturra, and Catuai have a better cup quality.

[9] This information appears on the Coffee Research Institute's web site: <http://www.coffeeresearch.org/agriculture/varietals.htm>.

Appendix J: Vacations

The vacation schedule at Santa Elena conforms to Mexican labor law, as follows:

1 year's service	6 days of paid vacation
2 years' service	8 days of paid vacation
3 years' service	11 days of paid vacation
…	…
20 years' service	15 days of paid vacation

Workers also have the following national holidays as days off (though they have the option of working on these days for double their normal wage if wish to):

National holidays
March 21
May 1
May 5
September 16
November 20
December 25
January 1

Source: Santa Elena administration.

Appendix K: Pay Scale

The following chart indicates the amounts paid to workers for the crop year 2000. In years when coffee prices are high on the international markets these wages rise. During the pre-and post-harvest periods, workers have the option of eating in the communal kitchen at the farm for 7 pesos daily (includes breakfast and lunch). During the harvest all meals are free.

Permanent Staff (Year-round)	**Salary in Pesos**
Gardener	37/day + meals
Cook:	45/day + meals
Driver:	100/day
Mill-house manager	60/day
Mill-house assistant	45/day
Agronomist	1500/every two weeks
Planner	1000/every two weeks
Night watchman	60/day
Electrical plant manager	42/day
Seasonal (5–6 months)	
Caporal (foreman)	42/day
Chaporro, poda, desombra	42/day
Deshije, compost, tree-nursery workers	37/day
Harvest (3–4 months)	
1 *caja* or 68 kg bag	44
1/2 *caja*	22
1/4 *caja*	11
1/8 *caja*	5.5

Source: Santa Elena administration.

Appendix L: Measurements

Measurement	**kg**
1 quintal	57
1 bag (*caja*) of coffee cherries	68
1 bag of parchment coffee (*pergamino*)	68
1 jute bag of export-ready *café de oro*	69

Source: Santa Elena administration.

Annex 1 Coffee Industry Overview

Modernization: Technified Coffee Farms

Twenty years ago nearly all coffee was grown on traditional farms. But during the debt crises of the 1980s that struck many coffee-producing nations, modernization of coffee farms was encouraged by international lending organizations and development agencies as a means of increasing yields and boosting export revenues. With the development of sun-tolerant varieties of coffee, coupled with chemical-based pesticides and herbicides, *cafetos* were moved into the sun. The use of shade could be discarded as the protective function it served had been genetically modified away.

In the short run, these methods did yield higher volumes of coffee and continue to do so. But the costs, in the long run, are high. Workers are placed at risk, as they must work with pesticides (often without adequate protection), which can have an adverse effect on their long-term health. For example, in Costa Rica's Central Valley, where half the country's population lives and where half its quality coffee is grown, there is the world's highest incidence of gastric cancer — a disease that has been linked to commercial pesticides and fertilizers used in coffee production.[10] Another long-term cost of sun coffee is that the soil, upon which the entire coffee industry ultimately depends, slowly becomes addicted to these chemicals and eventually becomes weaker and less productive. As well, soil is more easily eroded due to the lack of shade trees and organic matter to conserve it.[11] Aquifers are slowly poisoned. Species are invariably lost as their habitat becomes contaminated or disappears.

Modernization of coffee farms has been occurring throughout the coffee-producing regions of the world.[12] By the early 1990s, of the 2.8 million hectares of land used to grow coffee in Mexico, Colombia, Central America and the Caribbean, 1.1 million hectares had been converted into modern technified plantations.[13] In Mexico, 17 percent of the permanent croplands planted with coffee are modern reduced-shade farms.[14]

Santa Elena provides an important environmentally conscious and socially conscientious alternative to technified coffee farms.

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[10] Eldon Kenworthy at <http://www.planeta.com/ecotravel/ag/coffee/campaign/campaignb.html>

[11] Bill Fishbein and panel, "Defining Sustainable Coffee," <http://www.stoneworks.com/scaa1_archive/fishbein.html>.

[12] This trend may be reversing in some parts of the world (e.g., Costa Rica) back towards shade-grown coffee from monoculture.

[13] Robert Rice and Justin R. Ward in *Coffee, Environmental Conservation and Commerce in the Western Hemisphere*, p. 1.

[14] Coffee industry study, <http://www.itds.treas.gov/CoffeeIndustry.html>.

Production

Mexico is the fifth-largest producer of coffee in the world after Brazil, Colombia, Vietnam and Indonesia. The following chart gives the total production of these five countries.

Top Five Coffee-producing Countries in the World

(Total production in crop year 2000)

Country	Type of coffee	Amount (in thousands of 60-kg bags)
Brazil	(R)*	31,100
Colombia	(A)*	12,000
Vietnam	(R)	11,350
Indonesia	(R/A)	7,300
Mexico	(A)	6,338

Source: <http://www.ico.org>.
Note: *(R) = Robusta *(A) = Arabica

Imports

The United States is Mexico's main export destination and imports the most coffee in the world, almost one-third of the world's total production. In 2000, US imports of coffee were value at US$2.35 billion. Of this amount, the United States imported 3,609,594 bags from Mexico for a value of US$426 million.[15] On average, US coffee drinkers consume three cups of coffee daily, which equals the total annual production of twenty to thirty coffee plants over the year.[16]

The top 10 largest coffee importers are shown in the following table:

Top 10 Coffee Importers World-wide in 2000	
Country	**Amount** (in thousands of 60-kg bags)
United States	21,625
Germany	13,028
Japan	4,428
Italy	4,197
France	3,280
Spain	2,856
Canada	2,370
U.K.	2,195
Belgium/Luxembourg	1,712
Russia	1,358

Source: See <http://www.fas.usda.gov/htp/tropical/2001/12-01/dectoc.htm>.

[15] U.S. Dept. of Commerce, Horticultural and Tropical Products Division, FAS/USDA.
[16] Eldon Kenworthy at <http://www.planeta.com/ecotravel/ag/coffee/campaign/campaignb.html>.

Major Players

The global coffee market is estimated to be worth US$34.5 billion. The following four multinational firms roast, package and market most of the world's coffee supply:

- Swiss-based **Nestlé** (the world leader), maker of Hill Brothers, Taster's Choice, Nescafé and many other brands.
- **Philip Morris Companies Inc**., based in New York City. The conglomerate sells Maxwell House, Sanka, General Foods International Coffees and many other coffee brands, in addition to Kraft foods and Marlboro cigarettes.
- Chicago-based **Sara Lee** makes mostly European coffee brands, including Douwe Egberts, Marcilla and Merrild. The firm also has dozens of apparel lines—from Haynes to Playtex to Champion.
- The best-selling US coffee brand, Folgers, comes from **Procter & Gamble Co**. The Cincinnati-based firm is the country's largest manufacturer of household products—from Tide to Bounty—and the world's largest advertiser. In 1995, the company purchased the gourmet whole-bean brand, Millstone.[17]

Demand for Organic Products

The demand for organic products worldwide is two percent of the total worldwide consumption in foods. The value of this demand is estimated at US$11 billion per year worldwide.[18] The fastest growing niche in the specialty coffee market is organic coffee, representing an estimated five to seven percent of the total coffee market,[19]or roughly US$2.2 billion.

[17] Coffee industry study, <http://www.itds.treas.gov/CoffeeIndustry.html>
[18] *Tierra Fértil* (No. 6, March 2000), OCIA Mexico: Certificadora Mexicana de Productos Orgánicos S.C.
[19] Mark Perkins and panel, "Marketing to the Organic Coffee Niche" at <http://www.stoneworks.com/scaa1_archive/perkins.html>.