

Centerpiece

Costa Rican orange-peel project turns sour

The use of a juice company's orange waste to prepare conservation land for reforestation produces promising results... and a heated controversy

San José, Costa Rica

Orange juice producer Del Oro thought it had scored a public-relations coup when it signed an environmental services contract two years ago with authorities in charge of a neighboring conservation area in northern Costa Rica.

The deal involved a novel attempt to breathe life back into the depleted soils of deforested national park lands using tons of waste orange peels and pulp.

Rather than reaping praise, however, Del Oro found itself fending off attacks by politicians, a bitter industry rival and the media. The critics accused the British-owned company of defiling Costa Rica's natural patrimony and acting as an agent of "environmental neo-colonialism."



August 1997: Plant growth on former pastureland is limited due to poor soil conditions and the pervasive presence of jaraguá grass.

Del Oro spent \$100,000 in legal and public relations fees to defend the deal, but to no avail. Last year, the 20-year contract was revoked by order of Costa Rica's Comptroller General. Meanwhile, the head of the regional conservation authority who had negotiated the deal with Del Oro lost his job, albeit officially for other reasons.

The still-simmering furor has scotched the soil-restoration experiment indefinitely—and provided an object lesson in the political perils that can await even the most well-meaning environmental initiatives.

"It's frustrating to see the obstacles that have been placed in the way of [these] pioneering initiatives in biodiversity use," says Carlos Drews, a Colombian biologist who teaches wildlife management at Universidad Nacional, Costa Rica's second-largest university.

Del Oro is owned by the Commonwealth Development Corporation (CDC), a British government development agency. It controls 19,800 acres (8,000 hectares) of land between Costa Rica's Guanacaste Conservation Area (ACG) and the Nicaraguan border, 7,400 acres (3,000 hectares) of it under cultivation.

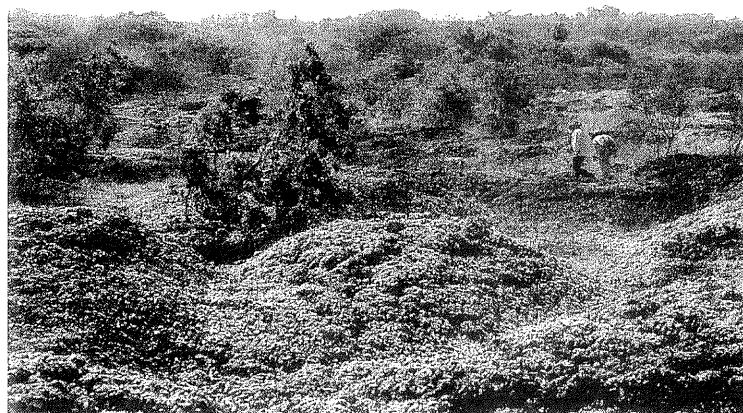
The company processes its oranges and those of other producers at its on-site juicing plant. Juice from its own fruit, about half of the total, is sold under the Rainforest Alliance's ECO-O.K. label, which certifies use of eco-friendly farming methods.

In 1997, Del Oro became the world's first citrus producer to obtain ECO-O.K. status, and—in 1998—the first to be certified in compliance with ISO 14001 environmental-management criteria set by the International Organization for Standardization in Geneva, Switzerland. The juice maker uses no pesticides or insecticides, turns most of its waste into compost and has preserved large tracts of woodlands interspersed among its groves.

As a sustainable business targeting the fast-growing green consumer markets abroad, Del Oro seemed certain to enhance its environmental image by entering into an agreement with the Guanacaste Conservation Area (ACG).

The conservation area is the product of a 1980s experiment to create a regional bloc of protected lands and manage it independently from the bureaucracy of the central government.

The experiment succeeded, spawning homegrown solutions to such problems as poaching, illegal logging and brush



April 1998: One thousand truckloads of processed orange peels have been spread during the dry season, completely covering the site.

fires. With the help of the country's Environment Ministry, similar efforts were launched throughout Costa Rica, which is now divided into a patchwork of autonomous conservation areas. These areas come under the jurisdiction of the National System of Conservation Areas (Sinac), a central government agency set up in the mid-1990s to coordinate forestry, wildlife and parks policy. However, the regional Sinac directors in charge of each conservation area are answerable to a locally elected council, which typically includes representatives of community councils, grassroots groups, businesses and government agencies.

Much of the impetus for the new entities came from Daniel Janzen, a tropical biologist with the University of Pennsylvania. Janzen has conducted research in Costa Rica over the past 37 years and is a non-paid technical advisor to the ACG. A passionate advocate of cooperative relationships between protected lands and surrounding communities, he played a pivotal role in crafting the agreement between Del Oro and the ACG—and is embittered by the outcome.

"From the first, Del Oro has bent over backwards to be good neighbors," says Janzen, who recommended Del Oro for

ECO-O.K. certification. "Major Costa Rican forces do not want to see true decentralization emerge. Events like the ACG-Del Oro [accord] become footballs in a much larger game."

The deal, struck in August 1998 between Del Oro and the ACG, would have transferred 3,000 acres (1,200 hectares) of the company's forested lands to the conservation area over a 20-year period. The woodlands, remnants of a transitional zone between dry tropical forest and rainforest, act as biological corridors for numerous animal species buffeted by ranching and farming.

Valued at \$480,000, they would have constituted payment for various benefits Del Oro derives from the neighboring protected area. These benefits include the natural pest control provided by pest-eating insects and other creatures that breed in the conservation area, as well as the clean water that flows onto Del Oro lands from the ACG's hilltop forests.

The annual price for natural pest control was worked out to be \$1 per hectare for the 1,685 hectares of Del Oro groves adjacent to national park lands, or \$1,685 in all. Water was valued at an annual \$5 per hectare for the 1,169 hectares of ACG-protected lands supplying water to Del Oro, a total of \$5,845 a year.

The contract also covered the rental, for \$1,000 a year, of a small plot within the conservation area where Del Oro could breed disease-resistant crop strains, and a minimum \$3,500

the waste to decompose into a rich soil that would enable forest regeneration. The U.S. biologist raised money to buy abandoned land, and in 1996 tried out the idea on a one-hectare plot with 100 truckloads of orange waste. He picked a site removed from rivers and streams to prevent the rotting orange waste from causing water pollution.

Four years later, ongoing scientific studies show that most of the jaragua has disappeared, a black loam has replaced the previously sandy soil, and some 50 species of broad-leaved herbaceous plants have taken root.

The experiment was repeated in 1998 on a three-hectare plot with 1,000 truckloads of orange peels, eight months before the Del Oro-ACG contract was signed.

However, the heaps of fetid, fly-infested mulch on what were seen as national park lands drew criticism, much of it from Del Oro's main commercial rival, TicoFrut. The two companies have been locked in a bitter struggle since Del Oro challenged TicoFrut's market dominance by opening its large juicing plant in 1996 with CDC financing.

TicoFrut, which is 98% Costa Rican-owned, charges that the environmental services contract is little more than a permit for improper disposal of its foreign-owned competitor's waste. TicoFrut President Carlos Odio says Del Oro should be com-



July 1998: Orange waste has begun biodegrading with the help of wild fly larvae and microbes, a process that will produce a rich layer of black loam.



December 1999: The stage is set for reforestation. The jaragua is gone and 90 plant species have taken root—70 more than were present when the project began.

annually for consultancy services by the ACG's technical staff and outside researchers.

But the biggest payment, \$11,930 annually, was reserved for the biodegradation of 1,000 truckloads of orange waste from del Oro's juicing plant. The waste would be deposited every year in selected sites within the conservation area.

Under a program devised by Janzen, the organic waste would be spread on three-hectare plots of former pastureland that had suffered centuries of biological degradation under the hooves of grazing cattle. The northwest province of Guanacaste is Costa Rica's ranching heartland, and more than a third of the 120,000 hectares of land inherited by the ACG are deforested.

Although no longer being grazed, these dense grasslands have shown little tendency to revert to the tropical dry forest that used to grow there. The main problem is the African grass species *hyparrhenia rufa*, known locally as jaragua, which chokes the landscape, crowding out native plants and serving as fuel for dry-season fires that kill saplings struggling to take root.

Janzen's idea was to smother this grass with orange peels and pulp that Del Oro would gladly pay to be rid of, and allow

pelled to build a proper waste-disposal plant just as his company was forced to do in the mid-1990s amid allegations that orange waste from its juicing plant was polluting a nearby river. So TicoFrut teamed up with a high-profile environmentalist and radio host, Alexander Bonilla, and enlisted the support of two prominent congressmen and a few citrus growers in denouncing the Del Oro project. However, none of Costa Rica's conservation groups joined in the attack on Del Oro.

At a lavish press conference at San José's Legislative Assembly in October 1998, Bonilla and TicoFrut presented video, photographic and documentary evidence. They claimed the waste was poisoning soils and nearby rivers and creating a dangerous breeding ground for citrus pests and disease.

Bonilla, who denounced TicoFrut's alleged pollution of river water several years ago, argued that orange mulch releases toxic citric acids and oils, including d-limonene, which he described as a dangerous carcinogen.

Such accusations had incited the Nicaraguan press to charge a few months earlier that Del Oro's "orange-peel dumps"

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were fouling Lake Nicaragua, complicating a long-running border dispute between Costa Rica and its neighbor.

TicoFrut and Bonilla quoted international citrus experts and extracts of legislation from orange-growing countries to suggest that leaving untreated orange waste in the open can propagate such destructive pests as the Mediterranean fruit fly. They also charged the environmental services contract was improperly vetted because it was pushed by two ministers who had served on Del Oro's board.

One of the ministers they cited was the acting environment minister at the time, Carlos Manuel Rodríguez, who signed the contract on behalf of the government. Rodríguez, an attorney, denied having sat on Del Oro's board but acknowledged representing the company while working in a law firm contracted by the CDC, Del Oro's British owners. The other official, Agriculture Minister Esteban Brenes, acknowledged having sat on Del Oro's board but denied any involvement with the contract.

TicoFrut also claimed foreign employees of the CDC and, by extension, Del Oro, had received diplomatic immunity as a sweetener to invest, and could thus act with impunity.

The Costa Rican Ombudsman's Office conducted its own review and declared the contract illegal. In its non-binding ruling, the ombudsman's office said no official studies had been done on the viability of the orange-waste experiment, and that due process had not been followed before the contract's signing.

Del Oro and its allies fought back. The company pointed out that experts used by its rival complained about being quoted out of context. It also noted that d-limonene, the orange oil also known as citrus terpene, is a standard ingredient in detergents and, according to the U.S. Department of Agriculture, "generally recognized as safe."

The Rainforest Alliance vouched for Del Oro's orange waste, calling it an "extremely benign by-product" that the company uses as a natural fertilizer. And Del Oro emphasizes that unlike in the TicoFrut waste case, the peels in Janzen's experiment were spread under carefully controlled conditions.

Meanwhile, the experiment drew praise from an independent team of university scientists commissioned last year by the current Environment Minister, Elizabeth Odio. The scientists concluded that the project's risk to the environment and to other citrus growers was negligible, and that the benefits for the conservation area's ecology were significant.

They said the experiment was particularly worthwhile given the scarcity of techniques in the dry tropics for restoring areas degraded by

grazing. A survey of the second orange-peel site last November by six agricultural scientists found that the waste had decomposed, leaving a 5-to-10-centimeter-thick layer of black soil on which more than 90 plant species are now growing, compared to about 20 before. Some of the new species are native trees.

However, it appears unlikely the forest-regeneration experiment will be expanded anytime soon.

In March of last year, Costa Rica's Comptroller General objected to not having been asked to review the environmental-services contract before it was signed. The Environment Ministry, arguing there had been no need to consult the Comptroller General because the deal did not require the expenditure of state funds, tried to resist the ruling. But Del Oro and the ministry were forced to cancel the agreement last August, and efforts to revive it since have proved unsuccessful.

For Del Oro, the reversal means continuing to find creative ways to dispose of its juicing waste. The company already has a waste processing plant, but it can only handle a small portion of the peels and pulp. Seeking to reduce its use of artificial fertilizers, the company has preferred to experiment with ways to use waste as organic fertilizer.

So besides taking part in Janzen's experiment, Del Oro has applied the orange mulch from its juicing plant straight onto its plantations. It also has developed a system for composting the waste before applying it. The compost is used exclusively on 25% of its plantations and as a supplement to artificial fertilizers on the rest.

TicoFrut's Odio dismisses such projects. "Let's not confuse the term 'composting site' with what it is: just an open-air dump," he says.

But Del Oro says the composting is part of a broad and continuing commitment to sustainable production. The company is currently undergoing re-certification for both the ISO 14001 and ECO-O.K. programs. It also plans to extend its ECO-O.K. program to Belize, where it recently bought two juicing plants and orange farms totaling 7,400 acres (3,000 hectares). And its Costa Rican operation has begun to diversify into mango, passion fruit and papaya.

Janzen, for his part, still holds out hope for the reforestation project: "The ACG has for the past 15 years been a world-class pilot project for forging links between a conserved wildland and the rest of society. Hopefully, there will soon come a day when it can again continue with this potentially highly successful way of approaching conservation."

—Guillermo Escofet