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Costa Rica: Pesticide Alternatives

Costa Rica is a small country in Central America with a population of 5.07 million people. They are one of the most developed countries in Central America. They are well known for their tropical climates and as a tourist hot spot since they have many beautiful beaches. They have a small farm industry and a few of these farms use many pesticides and struggle to protect their crops. But they still work as hard as they can and produce food for the citizens of Costa Rica and still have enough to export some of their crops.

This small country of 19,730 square miles has a democratic republic government. Their executive power has one president, two vice presidents, a cabinet of government chosen by the president. They also have legislative power in which they have 57 democratically elected deputies (“Costa Rica Embassy”).

Citizens of Costa Rica call themselves Ticos and have the highest life expectancy in the Americas perhaps because they live by their motto “Pura Vita” meaning bright life. They are very welcoming and kind. They love having guests and always greet each other every time they pass by one another. Hospitality is an amazingly large part of their culture; they grow up learning to care for others their whole life. Family is also a huge part of their culture as they tend to spend a lot of time with extended family. The average family size in Costa Rica is a family of four with two parents and two children. They also tend to have multi-generational households. And most Ticos enjoy foods such as rice and beans, potatoes, pork, beef, chicken, and fish (Lifey). These foods are often cooked on a wood stove and served on plantain leaves. 95 percent of the population on average attends school. The school system in this small country is set up just like ours; it goes up to high school (“Costa Rica News”).

The United Nations ranked the Costa Rican health care system in the top twenty worldwide and they are also ranked the best in Latin America. They have achieved this ranking because their healthcare is more affordable than some places like the United States. Their government pays most of the medical costs which makes it less expensive to go to a doctor if you have a problem (“expat”).

The houses in Costa Rica are kind of boxy and simple because most Costa Ricans don't have the money to pay for an architect to design and build a trendy home. Instead, families build something that they understand and can afford with their income(Costa Rica Information). When cooking, Ticos uses many fresh ingredients for their meals; they don't use many preserved ingredients and most foods are seasoned with lime and salt. They also tend to have fresh juice to drink. A traditional dish that they make is called Casado. Casado is made with many different foods such as fried plantain or french fries, avocado, tortilla with cheese, eggs, corn, and a vegetable stew called picadillo (“Travel Excellence”).

Costa Rica is a very proud country with a strong heritage. Ticos love to celebrate their Independence from Spain together. The Ticos, women of Costa Rica, have special dresses that they wear just for that one day. And they all dance in the streets and have parades in celebration. Costa Ricans celebrate many holidays; these are a few of them. Ticos enjoy multiple Spanish holidays Called Dia De Los Muertos or the Day of the Dead. This is a big festival in Latin America. They also celebrate Semana Santa which we call Holy

Week. Their Christmas tradition is to celebrate on Christmas Eve with fireworks, parties, family gatherings, and gifts just after midnight, and during the celebrations, they eat a lot of tamales. If you are visiting they will feed you a bunch of them then they will also send some home with you. Shopping for groceries is similar to the United States. They have stores that are organized. They call their stores pulperias or markets. (“Lifey”).

Clothes dryers are uncommon since Ticos prefer to go outside and hang their laundry up on a clothesline to dry in the hot Costa Rican sun so that they don't have extra heat in their house to worry about. Few people have cars in Costa Rica since they don't need them as much as we do in the United States. Because the country is small enough that they set up a bus system that goes throughout the whole country to transport citizens. This also assists the tourists so that they don't have to figure out how to rent a car or find a way to get around to all of the Costa Rican national parks. This form of public transportation makes the cost of living lower but the fuel prices higher for those who do have cars sense not much gas is purchased (“Lifey”).

There are many fun things to do in Costa Rica. Ticos tend to enjoy a few of these activities such as ziplining, horseback riding, sunset sailing, snorkeling, and diving which are very enjoyable in their comfortably warm temperature. These are also very popular among tourists because these all show off the beautiful landscape of the country. Soccer is a really big part of the daily lives of many Ticos for it is a large part of their culture to support a soccer team.

Some of the most popular jobs are acting as a translator or tour guide for the many tourists that come through to enjoy the tropical weather in Costa Rica. Many occupations in Costa Rica are in the area of tourism. Many people from all over the world want to see what this beautiful country looks like. Then there are the other popular jobs such as Internal Technology Consulting and editing with the average income around 21,754,733 colons per year or \$38,470 U.S. dollars. Intel has a factory in Heredia Costa Rica they have employed more than 2,000 people in Costa Rica since 1997 and Hewlett Packard Enterprises has three offices in Costa Rica and they employ 1,085 Ticos to run their facilities in San Jose, Heredia, and Cartago (“Nearshore America, Intel”).

Costa Rica does not have many Ticos participate in farming since only around 10% of the country is used for farming. While in the United States we use 51% of our land for animal and crop production. With the average farm size in Costa Rica being less than 25 acres per farm this gives the farmers very little land to work with. All the farmland added together gives us the total farmland across the country of 1,248,000 acres most of the farmland is used for their main crops.

Their main crops are Maize, Tomato, Potato, Cassava, Pineapple, rice, banana, coffee, sugar, tropical fruits, and palm oil. They also have many cattle and seafood farms. They rely on the farmers for the fresh ingredients for their favorite meals.

The Ticos that participate in farming and choose to grow and harvest pineapple have a major problem with pink pineapple mealybugs. Mealybugs terrorize the pineapple farms by transmitting a wilting disease to any plants they start to eat. Once a plant shows signs of the wilting disease the plant is removed and burned to try and prevent the spread of the disease (USDA, Pestnet). Mealybugs create a wax-like syrup that is called honeydew wherever they eat. When this covers the plant it prevents the plant from being able to do photosynthesis. This is how the wilting disease starts. They can transmit the disease easier than just their waxy honeydew; they can inject the plant with a toxin that contains the disease and it spreads

throughout the plant as if it was just water moving through the plant and spreading the disease as it goes (“Pestnet”).

Big Headed Ants actively protect mealybugs; they carry them to their nests or to other plants to keep them safe from getting killed when plants are removed and burned in exchange for a honeydew that the mealybugs make when eating the pineapple. They also protect them from their natural predators, ladybird beetles, and wasps, during and between pineapple growing seasons (“Pestnet”).

Scale insects are a kind of insect with scales that likes to suck the juices out of plants. But they are not as much of a problem as the mealybugs as they do not threaten as much to kill the plants as the mealybugs. The different types of scale insects are the armored scale and the soft scale. These scale insects all eat both banana and pineapple plants and suck the juices out of the crop which lowers the yield (“gardening know-how”).

Because of these different kinds of insects on their plants, the farmers buy more pesticides trying to kill all of the insects that they can. Costa Ricans tend to use a large volume of pesticides. Since they have these problems and use so many pesticides they use the largest amount of pesticides per hectare of land in the world at 18.2 kilograms per hectare of cropland. Using a large volume of pesticides can destroy your soil quality and make it infertile. In the United States, we only use 2.5 kilograms per hectare of cropland to help keep our soil healthy. They have to use more cyhalothrin than the recommended amount on their plants in hopes to kill the insects on their plant without them growing resistant to it. Since they didn't use the recommended amount of chlorpyrifos so the mealybug built up resistance to the pesticide and survives when it is sprayed instead of being killed by it. (“researchgate”).

The best way to get rid of mealybugs is to find a way to control the ant population. In Hawaii, they set pineapple approved ant bait and ant traps between rows so that when the ants go to the mealybugs they will find the trap this will allow the natural predators to rid the plants of the mealybugs with very little assistance from the farmer. Traps are a cheap solution that is also reusable as an inground plastic ant trap for approximately six dollars each. If you keep the big-headed ant population under control you will have a better chance to save the plants (“pestnet”). They don't yet have these ant traps in the country that are pineapple safe but they are easy to transport. They can easily be ordered online and shipped into Costa Rica and to the farmers. They also have the O.A.A Office of Agricultural Affairs to assist them

Traps are not the only way to slow the insects and reduce pesticides another solution to employ just like for nematodes that are common in the area you can do a three-year crop rotation if you have had mealybugs that year and clear the fields of pineapples for three years. Make sure you till under all the land in the region that had the wilting so that you can kill the big-headed ants. Their nests are close to the surface. This will make it easier for the natural predators and parasitoids to get to the mealybugs. You will need to plant grasses like green foxtail grass to hold your soil and prevent dust storms and save your soil. Mealybugs can't live off of foxtail and it makes very valuable forage hay since it is a kind of barley grass they can feed this hay to their cows (“pestnet”).

One more dimension to prevent an infestation is to keep the borders of your fields clear of weeds that may harbor mealybugs. That way as you watch and destroy the infested plants. You can still save as many of the other plants as you can one way to tell if the plant has mealybugs is to look at the roots. And check for the oval mealybugs they will be covered in a kind of white wax that is actually the honeydew. This is the

substance that is produced as they eat the plant. If more than three percent of the plants are infested then you use pesticides it is recommended to avoid pesticides until that point (“pestnet”).

This small country, approximately the size of the state of West Virginia, is largely family and culture-oriented and have multigenerational households so that they spend as much time as possible with their family. The culture is very friendly and welcoming. They love to be social and have come a long way for a developing country. They even have the two largest computer companies employing a large number of Ticos. Farming occupies only ten percent of the land yet they make it so that the Ticos can use as many fresh ingredients as they want for cooking amazing meals. They take care of their own people first and then they use the rest as exports. Though most farmers struggle with mealybug infested plants they still work hard to produce the fruits and vegetables for their fellow Ticos and Ticas. If they can find a way to dwindle the population of mealybugs in the fields they will have even more fresh ingredients available.

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