

CARDAMOM – A CROP CANNOT RUN AWAY FROM ITS PROBLEMS

Jeffery W. Bentley, Agro-Insight, Casilla 2695, Cochabamba, Bolivia describes the problems facing the cardamom crop in Guatemala. E-mail: jeff@agroinsight.com

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When crops are taken from one continent to another, their pests and diseases eventually catch up with them. When there is no research capacity to respond, the farmers can have serious problems.

Guatemala is poised on the edge of a disaster with cardamom (*Elettaria cardamomum*), a spice crop which has been grown in the Central American country for over 100 years. Cardamom is the fourth largest earner of foreign exchange for Guatemala. Central Americans do not cook with cardamom, and nearly all of their harvest is exported, half a world away, especially to the Middle East.

Thousands of Guatemalan farm families depend on cardamom, which is ideally suited to the cool, tropical highlands.

A cardamom virus arrived in 1975 and has already wiped out the crop in the southwest of the country. It first appeared around Quetzaltenango and by 1980 was present in nearly



all cardamom gardens and fields of the South Pacific coast of Guatemala, where 60% of the crop had been grown. It was probably spread by rhizome cuttings (Gonzalves et al 1986). In just the past few years, Guatemalan cardamom has also acquired two insect pests: the ginger weevil (*Cholus pilicauda*) and a tiny, black insect about the size of a pinhead, called the cardamom thrips (*Sciothrips cardamomi*) (Claudio Nunes, personal communication). The thrips entered Guatemala in 2012, probably from India, the homeland of cardamom.

In spite of cardamom's importance, Guatemala never established any research to support it. (The way that Colombia did with coffee, and Ghana did with cacao, for instance). This makes cardamom especially vulnerable to new pests and diseases. Some isolated researchers and international volunteers are trying to learn about these new problems and offer a solution, but when research starts from zero it may not find a solution in time.

Buying and roasting

There was always some inherent mystery and risk to buying and drying cardamom, but thrips has only made it worse. The cardamom fruit is juicy, like a grape, and before the berry can be sold, it must be dried, like a raisin. In Guatemala, Cardamom is dried for 36 hours on slow, wood-fuelled fires. Before thrips came, the buyers bought the fresh cardamom fruit from farmers at a standard rate, so much per quintal (100 pounds). As the berries passed up the value chain, from buyer to bigger buyer, the cardamom was dried, losing 80% of its weight. Only then was the cardamom's quality revealed, and the shrivelled fruits were classed by size and colour into various grades, each with its own price.

The recognised quality grades of cardamom are:

- Jumbo Green – extra-large green small cardamom pods
- Imperial Best Green – large green pods
- Fancy Green Extra – extra green pods
- Fancy Green – medium sized green pods
- Imperial Mixed Green – large pale green pods
- Mixed Green – pods of assorted colours
- Mixed Green Split – medium sized open green pods
- Yellow Mixed – medium/large closed yellow pods
- Mixed Yellow Quality – medium sized light-brown cardamom for grinding
- Seeds – cardamom with the husks removed

Source: (Milian 2014)

But with thrips, the uncertainty of buying is exaggerated. The Pacay brothers, Otto and Pablo, have been in the cardamom



Zipper damage

Melon rind damage

trade all their lives; their father taught them how to buy and roast the fruits. Buyers have been quick to invent names for cardamom damage. “We call this one zipper, and this one cantaloupe rind”. The brothers go on to explain that many of the thrips-damaged berries look healthy on the outside. The damage only becomes clear after drying. Buyers can lose a lot of money if they dry cardamom only to find that too many of the dried fruits were ruined by thrips.

The exporters and larger buyers are managing this risk by buying already dried fruits. Big buyers are now less interested in drying cardamom, so they pass the risk onto the smaller buyers, expecting them to dry the cardamom. The smaller buyers try to pass some of this risk onto the farmers, by paying less for obviously damaged fruits.

The loss for farmers

Lucía Caal Kul, in Alta Verapaz, is a family farmer, living in a house made of wood planks, with an earthen floor. She explains that the buyers now offer only 100 Quetzales (\$13.30) for 100 pounds of damaged or unsorted cardamom, but 220 Quetzales for healthy-looking fruit. Speaking through an interpreter in Quiché, one of the Mayan languages, Ms. Caal explain that before thrips, for eight months a year the money she earned from cardamom was just barely enough to buy food and medicine for her family. The loss to thrips has been devastating; farmers are earning less than half what they used to make.

Rudy Yaxcal, a buyer in Cobán, explains that this loss is clear when one buys from a community. A village that once had 800 quintals of cardamom to sell, now has 400.

Predictable responses

NGOs and agro-input dealers are responding in their own, if predictable ways. Ms Caal holds up a two litre soft-drink bottle, filled with a dull, yellowish liquid. An NGO helped her make a botanical insecticide in a workshop last year, using salt, marigolds and a broad-leafed, local plant called conón. In many countries NGOs recommend botanicals, seeing them as an inexpensive locally available solution but the NGOs often have little technical knowledge on the efficacy or safety of these projects. At any rate, it was too late in the year to spray the brew on the thrips. She is saving the herbal insecticide to try this year. Smallholder farmers are ever interested in trying new things.



The input shops are selling an insecticide, Muralla® Delta 190OD (active ingredients: imidacloprid – a neonicotinoid – and deltamethrin – a synthetic pyrethroid). This does seem to kill the thrips, at least in the short run.

The need for research

The problem is that the insecticide kills bees. And cardamom is pollinated by bees. So killing the bees with insecticide lowers the harvest, explains Claudio Nunes, a Canadian volunteer and one of the few entomologists working on thrips in Guatemala.

In India, cardamom is pollinated by at least five species bees (*Apis dorsata*, *A. cerana*, *Trigona iridipennis* and others), and by two birds as well (Kuriakose *et al.* 2009). Guatemalan cardamom has different bees (*Trigona* spp. and *Bombus* sp. (Lang 1982)), and possibly *Melipona* spp., but they are nonetheless bees, and insecticide still kills them. Nunes suggests a solution: try spraying the cardamom with one of the chitin growth inhibitors available on the market. (Research would involve trying different products under different conditions and measuring the results). These latest generation insecticides may keep the thrip nymphs from moulting, whilst sparing the bees.

It is a creative idea. Even in India, the recommendations for managing trips are to clean up the cardamom plant to let in more insecticide, and to spray with organophosphate insecticides.

But India does at least have the Indian Cardamom Research Institute (ICRI) and thrips-resistant cardamom varieties. Guatemala has neither. India and Guatemala are barely in touch with each other. Guatemala only opened an embassy in New Delhi in 2014.

Guatemala is proud to be the world's leading cardamom producer, but there is nothing inevitable about it. Guatemala only became the top cardamom grower in 1979–80, and peaked in 2013 with a harvest worth \$308 million (more was harvested in 2013, but due to lower prices it was worth less). And the monopoly years are over as Costa Rica, El Salvador, Honduras, Papua New Guinea, Sri Lanka, Tanzania, Thailand and even Vietnam are now planting cardamom.

The Guatemalans are finding that sometimes they have inventory left on their hands, bags of fine cardamom that go unsold at the end of the season. That never used to happen. Until two years ago there was such a demand for cardamom that even the dust from the processing plants could be sold for something.

Economist Jorge Escobar recalls his boyhood near Quetzaltenango, where cardamom was a way of helping women make ends meet. For much of the year, a few berries could be harvested every couple of weeks and sold for the little things that every rural household needs. But those days are gone. Virus wiped out the cardamom in southwest Guatemala. It is a reminder that pests and diseases can destroy a crop within a region.

Entomologists will not be able to solve all of Guatemala's cardamom problems, but some practical research in resistant varieties and rational chemical control could keep an industry from collapsing. Research to keep cardamom alive and healthy would benefit a lot of hardworking people.

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