

PROEXAG
NON-TRADITIONAL AGRICULTURE EXPORT SUPPORT PROJECT

STATUS OF THE COSTA RICAN BLACKBERRY INDUSTRY

Assignment Number: ST/030

REPORT

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**The Non-Traditional Agricultural Export Support Project
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United States Agency for International Development (USAID)
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PREFACE

The objectives of this assignment were to monitor both recently-planted and established, commercial blackberry farms in Costa Rica. Technical assistance was provided on all aspects of production, cultural practices, pruning, harvesting, and postharvest handling. Special attention was given to disease control management, especially anthracnose. Emphasis was also given to minimizing drupelet reddening through proper harvesting and handling practices combined with optimal postharvest precooling methods.

EXECUTIVE SUMMARY

The Costa Rican blackberry industry has expanded considerably since the initial 4-hectare farm was planted in 1989. A high level of interest exists in developing the export market potential of this crop. Currently there are about a half dozen independent growers in production or establishing blackberry farms for export. Costa Rica has about 15 hectares planted in domesticated varieties from Texas and additional areas in wild blackberries. The farms are scattered in different locations throughout the central highlands.

The outlook for blackberry production in Costa Rica for export remains positive. Success in the export market has been achieved by one grower, with several additional growers beginning to export this year, and more to follow next year.

The Texas cultivars (e.g. 'Brazos', 'Rosborough', and 'Brison") are well adapted to many Costa Rican microenvironments. They can be managed to produce high yields during the prime export months of November to May. Yields are generally similar between these varieties, although 'Rosborough' is slightly firmer, sweeter, and glossier in appearance. About 90 percent of the total blackberry area in Costa Rica is planted to 'Brazos'.

Common problems were observed in many of the farms visited. Improvements in the following need to be made to overcome existing production and handling constraints:

- 1- Lack of adequate windbreaks. These are essential for success, as blackberries are extremely sensitive to wind damage.
- 2- Lack of drip irrigation. Water stress during the dry season reduces yield and lowers fruit quality. The dry season coincides with the export market window.
- 3- Field sanitation. Many diseased leaves and fruit were left in the field. Anthracnose and Botrytis pressure is high.
- 4- Inadequate, forced air, precooling facilities on site. Rapid removal of field heat is essential for maintenance of shelf life and success in the export market.
- 5- Rough handling during harvest. Fruit bruising accentuates drupelet reddening.
- 6- Inadequate pruning. Too dense a canopy increases disease pressure, especially anthracnose during the rainy season.

Blackberries are a potentially rewarding export market crop, but adequate attention must be given to proper cultural practices and disease control to enable the plants to realize their yield potential. They are not to be viewed as a low-input, sustainable crop.

Special attention should be given to the development of the commercial raspberry industry in Costa Rica. Costa Rica should be able to compete successfully against Chile for the North American and European markets. The transportation advantage alone is over several dollars a flat. Market demand in the U.S. and Europe is about ten times more for raspberries than blackberries. Other Central and South American countries are increasing their blackberry volume. Competition will intensify and prices for blackberries will decrease due to more supply. Diversification in berry product line is important.

ITINERARY

April 04, 1992.

7:15 am Departed Hotel Europa with Angel Castro of CINDE. Picked up Dale Krigsvold at Hotel Bougainvillea.

8:15 am Arrived at Llano Grande de Cartago. Visited blackberry farm of Alvaro Figueroa. Hosted by farm manager Carlos Fernández. Farm is located on a sloping hill, 1700 meters elevation. They have 2900 plants in about 2 hectares, planted in November 1990. First harvest began in October 1991 and continuing until now. Entire farm in 'Brazos', except for a few vigorous 'Rosborough' plants, and a few less vigorous 'Shawnee'. Brix content of 'Rosborough' was 9-10%. 'Brazos' plants are full of flowers and fruit. Good plant spacing (2.0 meters apart) and row spacing (2.5 meter apart). Strong wire trellis support system plus drip irrigation. Proper plant training and pruning practices. Mites are severe problem. First time I observed mites to be this severe on blackberries. Observed quite a bit of anthracnose (Colletotrichum spp.) on foliage, even though Carlos told us he was spraying with Benlate/Captan. No bee hives for pollination. Best to use 5 hives per hectare. More windbreaks are needed to reduce plant stress and mechanical damage. They pick in carriers with a piece of cardboard over one side to protect the export grade fruit from sun and heat. Good idea. They classify the fruit as they pick in order to minimize handling again in the packinghouse.

This is the ideal system for blackberries. Excess handling causes fruit bruising and druplet reddening. Exportable yield during the entire month of March was about 400 flats per hectare. The 2 hectares are harvested daily by 8 male pickers. They are now picking 40-45 flats per day for export. They do not have any cooling facility on the farm. Not good. The picked fruit is held under shade in covered, styrofoam boxes for up to 5 hours before transport to San Jose to the company's cooler. Druplet reddening is a problem. A forced air cooler needs to be installed on the farm. The fruit is sold under the label 'Llanoberries" by Coraflor. Another concern is that the fruit may be stored for 2-3 days before export to the U.S. This system needs to be changed so that the fruit is held in Costa Rica for no more than 1 day after harvest. Challenge Air and Florida West cargo planes depart daily. American Airlines, Continental, and Lacsas also depart daily and take cargo in their passenger planes.

10.00 am. Visited steep hillside farm (about 45° angle slope) of Padre Solano in Paraiso. About 2 hectares of 'Brazos' were planted in clay soil with a pH of 5.0. No irrigation. The plants were stressed; cane height was only 4.5 feet and girth was thin. Leaves were small. They had a major anthracnose problem. Field sanitation was poor. Diseased leaves were left on the ground, serving as a source of inoculum to keep the anthracnose pressure high. They used a hand-pumped, backpack sprayer; insufficient pressure to give good canopy penetration of the fungicide. Plants were spaced correctly at 2.0 meters between plants and 2.5 meters between rows. They used ungalvanized barbed wire for the trellis. Not a good idea as it causes mechanical damage to the canes and makes picking and pruning difficult. Someone read the wrong book. The field was planted in October 1990 and the first fruit was harvested a year later. They have been picking since October in very small volumes. Fruit quality was very poor; full of anthracnose and small size due to nutritional stress. The primary laterals were in fruit lengths of 1-1.5 feet. This indicated severe plant stress, because 'Brazos' plants normally set their first fruit on secondary or even tertiary laterals. Soil pH needs to be raised to 6-6.5 with calcium and, copious amounts of organic matter/manure should be added to improve soil texture. Without drip irrigation it is unlikely that this farm will be successful for export. Soil and tissue analysis should be done as soon as possible to correct existing nutrient deficiencies. Field sanitation practices need improvement. If anthracnose is this bad now, what will it be like in the rainy season? Defoliation is likely. Wind stress is also a major problem on this steep, unprotected hillside/mountain peak. Windbreaks are desperately needed. Bees are also needed. No cooling facility on the farm, either. Only limited capital available to maintain the farm. It probably would be best to cut all the existing canes down to the ground and begin over with new emerging shoots. Many cultural practices need significant improvement.

11:00 am Visited neighboring farm of Ken Johnson in Paraiso. He has 1 acre of 'Brazos', 1700 plants. No irrigation. Barbed wire trellis. Clay soils desperately need organic matter. Lots of anthracnose on the leaves and canes. More windbreaks needed. Plant and row spacing are correct. He's harvesting small quantities for the local market. Problem is not enough capital to keep disease pressure down and to use proper cultural practices. No cooler on this farm or in the area. Several other small growers have 1-2 hectare plots in the area, all with similar problems. Blackberries are a potentially lucrative export crop, but adequate attention must be

given to proper cultural practices and disease control to enable the plants to reach their yield potentials. They are not to be viewed as a low input, sustainable crop.

- 1:45 pm Visited APROCAM, a group of producers of wild blackberry in Empalme. Located 40 km from Cartago, right off the Pan American Highway. Soil pH was 4.5 and magnesium deficiency noted. No drip irrigation. The plants were grown on a steep 40° hillside, but the rows were terraced. 'Brazos' had a lot of anthracnose and cane girth was thin. Low plant vigor due to nutritional and water stress. Plants had some flowers and fruit. Observed their 'silvestre' or wild blackberry plantings consisting of 3 types: 1) mora de Castilla, which is identical to the one grown in Colombia; 2) mora Vino, which has a smaller, rounder, fruit shape; and 3) mora de Caballo, of which they had few plants. These wild types had considerably less anthracnose, but the mora de Castilla exhibited virus-like symptoms on the leaves, e.g., crinkled, mosaic appearance. I suggested isolating plantings of mora de Castilla from 'Brazos' to minimize potential spread of virus to the domesticated variety. All wild types were in flower and fruit. Angel indicated that the mora Vino harvest period is from December to April. Botrytis is a serious problem here because they do not remove the old, poor quality fruit from the canes. Diseased, overmature fruit serves as a source of inoculum. APROCAM is currently exporting the wild berries through Coraflor. Non-export-grade fruit is processed at nearby 'Coopedelicious' puree factory.
- 3:30 pm Visited farm of Charles Darwin at La Cangreja, at km 35 right off the Pan American Highway. He has 500 'Brazos' plants literally on the summit of the mountain overlooking Cartago. Great view, but oh the wind does blow! Field was planted in October 1990. Excellent cement post and wire trellis system. Drip irrigation used. Proper 2.0 x 3.0 meter spacing. Plants were healthy. Pruning system fine. Some flowers and fruit. Main problem was too much wind. King grass windbreak needed here as soon as possible. Also observed poor growth of small hillside planting of 'Commanche'. Canes were only 1-2 feet tall, but were in fruit. Newly emerging shoots appeared vigorous. Old growth needs to be cut back to the ground as it is a source of disease. Soil pH of 4.5 is too low. Also needs calcium and organic matter.
- 5:30 pm Returned to Hotel Europa.

April 05, 1992.

- 7:15 am Departed hotel with Angel Castro. Picked up Dale.
- 8:00 am Visited 3-hectare blackberry farm of Quiros and Van Brocklin, S.A. in Patio de Agua de Coronado. Elevation is about 1500 meters. Entire farm planted in 'Brazos'. Discussed production, harvesting, and postharvest cooling with P.J. Van Brocklin, Alvaro Quiros and his sons Freddie and Eric. The farm was planted in August, 1990 with the first harvest beginning about a year later. The plants were in flower and fruiting. Yield potential was reduced because of a lack of drip irrigation and because of anthracnose disease pressure. Severe druplet reddening was a concern of the owner. On a visit to this farm a week ago, I made suggestions on how to minimize bruising during harvest by applying less fruit removal force. Harvesting the fruit more delicately and handling less often has resulted in a much higher packout of non-red fruit. The pickers now classify export versus domestic grade fruit in the field.

The company had begun to export this week (April 2) through Coraflor. They are picking 40-45 flats per day for export, and 60% of their harvest is export grade. Adequate forced air cooling is located on the farm. Improvements are needed in anthracnose control and better pruning to allow more air flow through the canopy.

- 10:00 am Visited 2-hectare farm of Johnny Soto and his father Antonio in Coronado. Plants were put in the field in August and December 1991. Farm is flat and soil is very rich. Former cow pasture. King grass planted around perimeter for wind protection. I recommended another row of King grass in the middle of the field for additional protection. Plants were growing nicely, but weed pressure was high and they need to start training the principal canes upright. No anthracnose. Good plant spacing and trellis system. Drip irrigation system needed. Discussed packinghouse and cooler design. All indications are that this farm will be excellent for blackberries.
- 12:30 pm Visited 1-hectare farm of José Miguel Perez in Sabandilla. 'Brazos' were planted 9 months ago on steep non-irrigated, clay hillsides of a cattle/coffee farm. More organic matter needed to build up soils. Plants are stressed from lack of water. Soil and tissue analysis needed. Hillsides need terracing badly. Rows are crooked. Very difficult to walk down the rows without falling

down. The posts and wires for the trellis were offset too far from the plants. Training will be a problem. The access road to the field is extremely rough. Lots of fruit bruising will result if improvements are not made. A good suspension system will be needed in his field vehicle. A cable for transporting the fruit out of the field may have possibilities here. Adequate on-farm cooling is available.

2:00 pm Visited 4-hectare farm of Lorenzo Moll in Fraijanes, at 1650 meters elevation. It is the largest blackberry farm in Costa Rica and was the first domesticated blackberry farm. Named Corafior, it is currently the only exporter. This farm produces over 90% of the blackberries exported from Costa Rica. Also sells fruit for other producers. 'Brazos' and 'Rosborough' are the two main varieties, along with a few 'Brisson'. It is a well-managed farm and Lorenzo pays careful attention to proper cultural practices and pruning. Plants are vigorous; full of flowers and fruit. It's the farm other interested growers visit to learn more about blackberries in Costa Rica. Harvest is between 2100-2600 exportable flats per month off of 3 hectares. The other hectare is in a younger stage of development. Yields of exportable fruit have been excellent; around 750 flats (12 half pints) per hectare per month over the past 6 months. The extremely high percentage of export quality fruit (nearly 88%) is partly due to excellent, forced-air, precooling facilities located on the farm and to adequate cold storage capacity. The main problems are drupelet reddening after harvest and anthracnose during the rainy season.

5:00 pm Returned to Hotel Bougainvillea to review field visits with Dale and Angel.

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