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[admin@ttfnc.org](mailto:admin@ttfnc.org)

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## Notes on Abundance of High Quality Cocoa Varieties in Grenada, West Indies

Phillip J. Howard and Sarah C. Harvey

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## Notes on Abundance of High Quality Cocoa Varieties in Grenada, West Indies

There are three general varieties of cocoa (*Theobroma cacao* L.) recognized based on morphological traits and geographical origins. This includes the main genetic groups, “Criollo” and “Forastero” and a third group, “Trinitario”, consisting of “Criollo”x“Forastero” hybrids (Motamayor *et al.* 2008). Forastero is the world’s most widely cultivated variety accounting for close to 90% of the world’s chocolate and is grown mainly in Africa (The Field Museum 2007). The low price and basic chocolate flavor make the Forastero a good “bulk” cocoa and it is most often used by milk chocolate makers (Wood and Lass 1985). The Criollo is the earliest known variety of cocoa and produces some of the highest quality cocoa. However, Criollo varieties are less commonly grown by farmers because they produce fewer seeds, are less vigorous and tolerant to diseases than Forastero varieties, and require more stringent shaded growing conditions that closely mimic the wild conditions under which the plant first evolved in the Amazon Basin (Cheesman 1944; Wood and Lass 1985; The Field Museum 2007). The Trinitario is a cross of the Criollo and the Forastero developed in Trinidad and is believed to be the most dominant cocoa variety in the Caribbean. The Criollos and the Trinitarios are known as “fine or flavor cocoa” because they produce a higher quality bean sought after by artisan chocolate makers due to the more complex and intense quality chocolate flavors such as fruitiness (Presilla 2001).

Cocoa was first introduced to Grenada in the early 1700s by the French. Since then Grenada has become one of only eight exclusive (100%) “fine or flavor cocoa” exporters by the International Cocoa Organization (ICCO), making it home to some of the world’s best cocoa. However, few researches have attempted to census the different varieties of cocoa that make up Grenada’s unique high quality cocoa.

Teamed with the Grenada Cocoa Association and Larry Burdick Chocolates, a total of 60 randomly selected farms across all parishes (except St. George) were sampled during the months of July and August of 2009. Censuses were designed to conduct a thorough but rapid assessment of cocoa varieties in each farm generating a general picture of which varieties are most dominant and to establish a standardized sampling method that can be used in the future by other researchers or farmers.

At each farm, one randomly selected continuous 20 m x 20 m survey plot was created. For each cocoa tree inside the plot a clone ID number was recorded based on leaf, pod, and flower structure and a GPS point was tak-

en. Each clone identified was assessed for Criollo content through use of CocoaGenDB’s (<http://cocoaгенdb.cirad.fr/index.html>) germplasm clone ID search; a new online database that allows complex queries combining existing genetic and phenotypic information.

A total 1139 trees and 37 clones were documented during this study. There were 12 clones identified as having high Criollo content: GS10, GS19, GS29, GS36, ICS32, ICS89, ICS95 (Johnson *et al.* 2004), UF221, UF650, UF654, UF667 and UF668 (Johnson *et al.* 2007). These clones made up 71% of the total tree count. Only two clones were identified as having high Forastero content (ICS1, to a lesser extent, and IMC67, an Upper Amazon Forastero) and these clones made up 3% of the total tree count. The GS29 Criollo-like variety was by far the most common planted variety of cocoa in Grenada occurring on over 96% of the farms sampled and accounting for over 37% of the entire 1139 trees sampled (see Table).

The average age of Grenada’s cocoa farmer is 59 years and younger generations are leaving the farms in pursuit of job opportunities in urban areas. The changing demographics of Grenada’s cocoa farmers put cocoa farming in Grenada at risk. Promoting and raising market awareness for Grenadian chocolate is essential to the survival of this industry. Recently, there have been efforts to revitalize the industry by the Cocoa Farmers Future Initiative, Grenada Chocolate Company Ltd. and the Grenada Cocoa Association in conjunction with the Cocoa Research Centre. These actors have made great strides in promoting the Grenadian chocolate industry and may serve as a model for sustainable cocoa farming in the Caribbean. The Cocoa Farmers Future Initiative ([www.cffigrenada.org](http://www.cffigrenada.org)) was established in 2001 in order to aid cocoa growers as they recover and re-establish their farms post-hurricanes, add value to their crops, encourage the next generation of growers, and maintain the island’s biodiversity. The Grenada Chocolate Company Ltd. was founded in 1991 with the vision of creating an Organic Cocoa Farmers’ and Chocolate Makers’ Co-operative. This co-operative system ensures that all workers, from the farmers to the chocolate makers, are paid the same rate and that cocoa is grown and produced sustainably. This co-operative now includes over 200 acres of organic cocoa farms which produce small batch chocolate with solar-electric powered machines. In 2012, more initiatives such as the “Cocoa Farmer Field Schools” were rolled out by the Grenada Cocoa Association in conjunction with the Cocoa Research Centre, Trinidad. This program, funded by the Centre for Development of Enterprise, will educate

**Table.** Results of Cocoa Surveys in Grenada, July and August of 2009.

Clone ID	Variety	Total Count	% Total Count	% Farms Present	Average Count per Farm
GS29	Criollo-like	428	37.58	96.67	7.13
GS19	Criollo-like	135	11.85	73.33	2.25
GS36	Criollo-like	113	9.92	70.00	1.88
ICS95	Criollo cross	82	7.20	70.00	1.37
GS17	unk	44	3.86	43.33	0.73
GS46	unk	36	3.16	28.33	0.60
GS53	unk	36	3.16	31.67	0.60
GS67	unk	25	2.19	26.67	0.42
GS26	unk	23	2.02	25.00	0.38
ICS01	Forastero	23	2.02	30.00	0.38
GS18	unk	18	1.58	26.67	0.30
GS48	unk	17	1.49	26.67	0.29
ICS06	unk	17	1.49	11.67	0.28
ICS32	Criollo cross	12	1.05	13.33	0.20
ICS89	Criollo cross	11	0.97	11.67	0.18
GS43	unk	11	0.97	18.33	0.18
UF221	Criollo cross	10	0.88	13.33	0.17
GS71	unk	10	0.88	11.67	0.17
GS65	unk	9	0.79	11.67	0.15
IMC67	Forastero	9	0.79	6.67	0.15
GS55	unk	8	0.70	6.67	0.13
GS77	unk	7	0.61	8.33	0.12
GS78	unk	7	0.61	8.33	0.12
UF667	Criollo cross	6	0.53	8.33	0.10
GS15	unk	6	0.53	8.33	0.10
GS40	unk	6	0.53	10.00	0.10
GS76	unk	6	0.53	10.00	0.10
GS32	unk	5	0.44	6.67	0.08
GS30	unk	4	0.35	5.00	0.07
UF668	Criollo cross	3	0.26	3.33	0.05
ICS98	unk	3	0.26	5.00	0.05
UF650	Criollo cross	2	0.18	1.67	0.03
GS14	unk	2	0.18	3.33	0.03
GS57	unk	2	0.18	3.33	0.03
GS10	Criollo	1	0.09	1.67	0.02
UF654	Criollo cross	1	0.09	1.67	0.02
GS05	unk	1	0.09	1.67	0.02

the farmers in Best Practices and Good Agricultural and Management Practices to ensure the most productive and profitable cocoa production systems and value chains.

These efforts are important for creating a sustainable future for Grenada's cocoa economy. They provide financial incentive and protection that make cocoa growing and chocolate making a viable alternative to the urban workforce; this is what will allow for younger generations to return to the Grenadian cocoa industry. Additionally, they create a system of cocoa growing and production that helps to protect and maintain this rare and unusually rich tropical ecosystem that might otherwise be logged, grazed, or sold for resort development.

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#### **Phillip J. Howard**

Garcia and Associates  
2601 Mission Street, Suite 600  
San Francisco, CA 94110  
[philliphoward85@gmail.com](mailto:philliphoward85@gmail.com)

#### **Sarah C. Harvey**

[sarahharvey1986@gmail.com](mailto:sarahharvey1986@gmail.com)

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