



Where I work
Morexa
Martin-Gardiner

Photographed for *Nature* by
Micah B. Rubin.

Sugar-cane research in Barbados goes back to colonial times. The breeding programme of the West Indies Central Sugar Cane Breeding Station, where I work, began in 1888.

The operation is owned by its members, including countries across the West Indies and three Florida sugar companies. I was fascinated by this network as an undergraduate student on Trinidad, where the sugar-cane selection protocol was part of my training. After I earned a master's degree in plant science in 1999, I learnt that the station had a vacancy. Today, I select the varieties to cross-breed each year to produce seed for our members' cane crop.

In the 1950s and 1960s, staff travelled to New Guinea, home to one of the original sugar-cane species, to establish a genetically diverse, disease-resistant population by incorporating wild genes. The resulting plants are also more fibrous, which appeals to growers interested in biofuel production.

We assess the sugar content of our output by measuring its Brix level, the percentage of dissolved sugar in the cane juice, by mass.

A Brix value of 20 was once the industry standard, and breeders thought that it couldn't be increased. But we realized that we could breed to accumulate genes for sugar production, and now routinely produce commercial clones with a Brix level of 27.

Measurements of our cane's fibre levels, sugar content and moisture guide our breeding selections. We used to analyse about 50 samples a day. With our SpectraCane – the customized infrared spectrometer into which I am feeding the cane in the photograph – we now analyse up to 600 a day. The feed chute is a modified meat grinder.

If I had a conventional laboratory job, I would be doing much the same thing year round. Here, what I do changes continually with the seasons. I like the fact that I get to do science while working outdoors. Each day is different, and I enjoy the adventure in that.

Morexa Martin-Gardiner is principal plant breeder for the West Indies Central Sugar Cane Breeding Station in Sweet Vale, Barbados. **Interview by James Mitchell Crow.**