

Oranjestad, 10 December, 2012 - When word got out several years ago about the promise of a small subtropical tree called jatropha, it became a biofuel sensation. Advocates claimed the fruit tree was hearty, drought-resistant and could be grown on marginal land. Its oil seeds offered a promising biofuel that wouldn't compete with food crops.

Air Japan, Continental Airlines and Air New Zealand ran test flights using jatropha-based biofuel, prompting more than 100 companies to plunk down millions on jatropha plantations in developing countries. Then everything crashed. Jatropha, it turned out, was much harder to grow than once thought. Yields were inconsistent, and many farmers didn't have the training needed to manage commercial-scale crops. Most of the jatropha operations shut down.

Except for a few outliers. While most companies raced to commercialize the fuel, San Diego-based SG Biofuel took a different path: It hired plant geneticists. They hunkered down in the laboratory to come up with the best genetic variations of jatropha -- ones that would be more consistent, easier to grow and could produce more oil.

"We were impressed they waited until the plant science was there," says Darrin Morgan, director of sustainable biofuel strategy at Boeing. Boeing has collaborated with the startup, sharing its own biofuel research and making industry introductions for SGB in Brazil and other markets.

Armed with backers like Boeing, \$27 million from energy and biotech investors, SGB is now testing its genetically boosted seeds in India and Brazil. Plenty of observers are watching to see if it pays off.

SGB was launched by CEO Kirk Haney. Haney was working at a friend's sustainable forestry company in Guatemala when a local told him about the promise of jatropha. Like everyone else, Haney saw opportunity. But when he sought advice from University of California plant scientists about what seeds and soil to use, they had never even heard of the jatropha tree.

"He left and I started Googling it, trying three or four different spellings," says plant geneticist Bob Schmidt, now SGB's chief scientist. "The more I learned about it, the more excited I

became about it."

But Schmidt ultimately told Haney that the existing, wild jatropha seeds wouldn't work. Anyone hoping to profit from the plant would first need to fund a breeding and biotechnology program to develop hybrid seeds with higher yields that could grow in some of the most infertile ground in Africa, Southeast Asia and Latin America.

Jatropha was a perfect candidate for experimentation, Schmidt says, because it reseeds quickly and has myriad genetic variations from which to pull.

In 2008, the startup lined up \$200 million from investors. Then the economy collapsed -- and so did the jatropha hype. Three weeks before the cash hit the bank, investors pulled out.

Over the next two years, Haney rounded up \$9.4 million from angel investors and from Flint Hills Resources, a large petroleum and ethanol refiner, and Life Technologies Corp., a biotechnology tools company. Last year, venture capital investors put \$17 million more into the startup.

Today SGB has 13 field trials of its hybrid seeds in Brazil, Guatemala and India, and it's trying to expand and move into Africa and Southeast Asia. The company plans to emphasize on farmer education and selling not only its seeds but also its expertise. SGB plans to collect royalties on fuel produced from its seeds.

One new customer, JetBIO -- a Brazilian consortium of Airbus, the Inter-American Development Bank and TAM Airlines -- is optimistic about an ongoing field trial it's doing with SGB in Brazil. "I think this will be game-changing in the industry, because what it really lacked was proper genetics," says Rafael Abud, JetBIO's managing partner.

Still, the company's fate is tied to many forces beyond its control, including potential changes in renewable energy policies in countries across the globe. Demand for biofuel is huge, but SGB has a lot to prove.

Jatropha needs to prove it can be an economical alternative to conventional fuels. "The plant needs to perform," says Boeing's Morgan. "If so, they're the beginning of jatropha 2.0."

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