

Jatropha around the world: As SGB raises \$11M, here's a 13-country tour of development activity

Jim Lane [September 11, 2014]

The 2000s-era wonder crop went quiet as “plant anything, anywhere” gave way to the “develop genetics, boost yield” movement, led by SGB.

Today, SGB moves forward again with new financing.

In California, SGB announced an \$11 million Series C financing to drive commercial rollout, after reducing the time to maturity from 5 years to 1-2 years in its latest generation of Jatropha hybrids

Based on 100 acres of pre-commercial trials of its top 10 hybrids, SGB's best performing hybrid to date eclipsed an equivalent of 300 gallons of oil per acre in year one with a corresponding protein production of 0.6 metric tons, surpassing protein yield of soybean by more than 30 percent. Total yield also includes 20 metric tons of green biomass per acre.

A [white paper](#) released today and authored by Dr. Bob Schmidt, SGB's chief scientist outlines how SGB has accomplished the domestication of a new crop species.

The \$11 million financing is led by SGB's current investors including Thomas Mc Nerney & Partners, Finistere Ventures and Flint Hills Resources (a wholly-owned subsidiary of Koch Industries). Concurrent with the raise, SGB's board has appointed Arama Kukutai as executive chairman and Miguel Motta as president and chief operating officer. Kirk Haney has stepped down as CEO to pursue other opportunities but remains a director of the company. The funding will be used to drive commercial partnerships and project deployments focused on Central America, India and Southeast Asia, and to further advance genetic improvement, and agronomic best practices to maximize the full potential of the crop.

“The yield from our hybrids are stunning, and SGB's investors clearly recognize the significant opportunity arising from having the first new proven crop for protein and oil since Canola was developed in the 1970s,” said Kukutai, who doubles as managing director of Finistere Ventures. “Our scientific and breeding teams have cracked the code and the technology is now ready for full-scale commercial deployment of Jatropha. This financing underscores that Jatropha has risen from the ashes and will be a major plantation crop and viable alternative to palm and soybean as a sustainable source of oil and protein.”

The Digest's Take

Five things to note here.

1. The time machine effect. We're seeing the timeline getting crushed down for a) bringing a crop forward to maturity and b) taking a crop from wild through to hybrid domestication in around 6 years, or about a decade faster than canola, and decades faster than corn or soy in their day. That's very interesting material to chew on for those who think the venture model is broken.

2. The soybean model. The real breakthrough here is going to be less on the yields, and more on opening up jatropha meal as a protein feed product. That takes this from a fuel play to a soy oil / soy meal play — and if you're thinking “Asia”, that's a good direction to point one's imagination in. Especially for those parts of South Asia where soy has proven problematic. Think India, of course.

But it's more than geography, it is the model — where you can subsidize the entry into the fuel markets with the protein value — or, when fuel prices are high and food prices low, subsidize the other way. There's some hedging in there — and, ultimately, two gigantic markets to chase.

3. The land value lift. One of the most interesting aspects of jatropha is how it is likely — because it is not a water or nutrient-hog (though it needs both, don't kid yourself) — to be deployed into land with lower-intensity agriculture. Possibly abandoned land. Think agroforestry or low-density grazing land. That is to say, not conflicting with food crops — going, rather, the other way. “Changing the class of use is the top strategy of every farmer,” SGB chairman Arama Kukutai told The Digest. “When you have an old low-value use, and a new higher-value use enabled by technology, on Wall Street they call it arbitrage. In the ag world, they call it farming.”

Suggesting that the combination of an emerging land-use technology and underused, undervalued land assets are a classic investment match. We'll be interested to see how companies like SGB develop business models to enable grower adoption and investment, while retaining for the company a share in all the value-add across the supply chain.

4. Couple of directions to think about for jatropha's future development. One, think in terms of developing it as an annual, rather than a perennial. Happened with cotton, could happen again. And — in addition to the work done on fruit size and time to maturity — perhaps we'll see the kind of “transistors on a chip” work done on increasing the number of plantings per hectare. That sums up a lot of the yield increase with corn, could happen again.

5. The idea of a company approaching jatropha as a wild genome that needs technology developed to domesticate, hybridize, stabilize, and develop high-return possibilities. That's new since the “plant 'em if you got 'em” years, which retiring SGB CEO Kirk Haney described as “the days of jatropha 1.0”. Most of what we still see around the world are jatropha 1.0 efforts — that's not to say they are doomed to fail, but rather they are likely to succeed, where they do succeed, because of unique conditions pertaining to geography and agronomics.

Jatropha around the World

The Bahamas. [Last November we reported](#) that Grand Bahama Power Company (GBPC) held the opening ceremony on Tuesday for their Biofuel Demonstration Project. Partnering with the Grand Bahama Port Authority, The Grand Bahama Development Company and the Garden of the Groves, the project focuses on the feasibility of cultivating jatropha to make biodiesel fuel that would be burned in the GBPC facilities to make electricity.

Botswana. [In August, we reported](#) that the country aims to approve a national energy policy by 2015 that will include a large renewable energy component, including



biofuels. The government has been working with the Japanese to develop varieties of jatropha that will be tolerant to the extreme weather shifts experienced in the country. The energy minister admitted that a lack of policy had hindered investment in biofuels thus far.

Costa Rica. [Last December, we noted](#) that Alternative Fuels America was beginning a three-phase trial production run of jatropha-based biofuel as the next step toward commercialization of its "seed to pump" vertically-integrated endeavor. The feedstock for Phase 1 will come from AFAI's plantation in Tempate, Costa Rica.

Ethiopia. [In July, we reported](#) that the Ethiopian government is investing US\$2.8 million, with the help of funding from the Norwegian government, to produce 500 million liters per year of biodiesel from jatropha. The project will take place in 18 districts in five states and is estimated to help more than 14 million farmers and pastoralists.

Ghana. [In August of last year, we reported](#) that Smart Oil Ltd had signed a license and services agreement with QUINVITA. This agreement provides access to the QUINVITA advanced agronomy know how and to seed of the best QUINVITA (QVP) cultivars of *Jatropha curcas*. Niquel Lda., a Mozambique based company active in the production of renewable energy from *Jatropha curcas*, has also signed a license and services agreement with QUINVITA.

Guatemala. [Last October, we reported](#) that SGB had signed a mandate letter with the Inter-American Development Bank (IDB) for the debt financing of its 25,000 acre *Jatropha* bioenergy project in Guatemala. The project cost is estimated at approximately US\$76 million. The mandate letter enables the bank and SGB to proceed with financial, technical and environmental due diligence on a project that aims to produce 6.2 million gallons of plant oil and 640,000 metric tons of biomass per year while stimulating rural economic and social development, including the creation of more than 1,000 new jobs, improved infrastructure and health and education programs.

India. [In July, we reported](#) that the government regulator Sebi has found Sunshine Global Agro Limited (formerly known as Sunshine Forestry Private Ltd) cheated 40,000 investors who were told that by investing 1,000 rupees in a jatropha seedling, they would be worth 3,000 rupees seven years later. The scheme has also included goats, cows and emu birds in an attempt to shore up investors.

[Last September, we shared](#) that Indian Railways' research arm had approved field trials using jatropha-based biodiesel in two locomotives in Jetalsar. The three to four month trials will start with B10 and will work their way higher. Lab tests have been successful using 100% jatropha biodiesel in locomotives.

[In June, we reported](#) that researchers at the Central Salt and Marine Chemicals Research Institute (CSMCRI) at Bhavnagar found that jatropha is safer and provides better fuel economy than fossil-based diesel. However, the researchers reported minimal availability of jatropha seeds, despite the 4% lift in fuel economy. This report is here.

Jamaica. [In March, we tipped](#) a story that Petroleum Corporation of Jamaica research shows that a variety of castor bean that comes from China, Zibo 8, could be the most productive for local production. Following two years of variety trials under the Scale Biodiesel Pilot Project, Zibo 8 had the highest oil yield. A Brazilian variety had slightly higher oil content but the overall yield per acre was higher for the Chinese variety. A total of 16 acres were planted under the trials where five varieties of castor bean and one variety of jatropha were grown.

Kenya. [In June, we shared](#) a study from ICRAF this spring showed that jatropha isn't a viable crop for the country because there is no market for the seeds, the values and yields are low, farmers don't know how to grow it well and its early reputation as a miracle crop has destroyed most of the farmer appetite for the plant.

Mexico. [In July, we reported](#) that Bosques Energeticos EBE S.A. de C.V. has secured 7 more hectares on top of the current 11 hectares it already has in Morelos state to plant its G4J cultivar of jatropha. The cultivar is bred to be early, high-yielding and non-toxic. The company has a total of 28,000 jatropha trees in the ground, half of which are G4J, and 16,000 pongamia trees along with 3,000 castor plants.

Sudan. [In late 2012, we reported](#) that Saudi Arabian company Tala had teamed with Canada's Nova Global on a \$650 million sugarcane project that will produce sugar and ethanol in Sinnar state, as well as a jatropha project that will supply oil to Middle Eastern airlines. The project will encompass about 156,000 acres.

USA. [In Hawaii, jatropha harvesting began](#) in August 2013 at the Hawaii Pure Plant Oil (HIPPO) farm founded in 2008 by father and son partners Christian and James Twigg-Smith. HIPPO has planted a total of 200 acres of jatropha in the Puna district of Hawaii Island with the intent of harvesting its seeds and extracting the oil for biodiesel production. Now, five years after the farm's inception, the Twigg-Smiths have formed a direct collaboration with Pacific Biodiesel Technologies under its federally funded Hawaii Military Biofuel Crop project. The project involves developing production models for jatropha and other crops to share with potential biofuel crop growers throughout the state.

Zimbabwe. [In June, we shared](#) a report conducted by Environment Africa and WWF did a study on jatropha production at household level and found that it was economically viable even if yields were as low as .5kg per hectare when jatropha cake along with other byproducts and household lighting were the aim. When the model was to sell the seeds to crushers for biodiesel production, the benefits didn't work out for communities.

More about SGB

SG Biofuels [plant biotechnology program is accelerating](#) the improvement of *Jatropha* through the association of molecular markers with trait genes and the development of plant regeneration, transformation and dihaploid technologies. The company has sold more than 250,000 acres of its hybrid *Jatropha* seed.

Through its JMax hybrid seed product line, and patent-pending hybrid seed production methodology, SG Biofuels provides growers high yielding, uniform and profitable *Jatropha* seeds that have been adapted to their growing conditions. Hybrid seeds result in greater yield, uniformity and vigor while significantly reducing handling and deployment costs.

The yield goal? One metric ton of product per acre per year — competitive with typical rubber yields out of Southeast Asia — by 2018-19. And progress from around half that yield between now and then.

The cost goal? SGB says that its hybrid *Jatropha* can produce high quality *Jatropha* crude oil at a cost of between \$99 or less per barrel today, with a clear path to reduce production costs through molecular breeding and biotechnology.



BEFORE



and the **AFTER**

In April 2013, Bloomberg reported that jatropha 2.0 developer SG Biofuels is "seeking a partner in Southeast Asia or Africa and expects to complete a cooperation deal within 180 days" to expand its growth in the hot, "growing zone" for jatropha. SGB has signed up [partners with more than 250,000 acres signed up in various field trial and deployment agreements – including an agreement to trial jatropha with Bharat Petroleum in India with 86,000 acres for first phase commercial deployment following the trials — and a similar 75,000 acre deal in Brazil with a consortium including JETBIO, Airbus, the Inter-American Development Bank, Bioventures Brasil, Air BP and TAM Airlines. SGB has been relatively cagey about yields – pointing out that they will vary substantially depending on geography, but some time ago they pointed to 350 gallons per acre as a suitable target given effective site selection and cultivation processes. Even 200-300 gallons in cold regions like the United States. That's a huge improvement over the 60 gallons of oil per acre that soybean produces.

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