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Former weed may fill world's fuel tanks

By Mark Sappenfield, [The Christian Science Monitor](#)

Jagdalur, INDIA — In an overgrown corner of Moolchand Sethia's plantation, runty and unloved, stands what could be the next revolution in the world's search for renewable fuel.

From China to Brazil, countries have begun setting aside tens of thousands of acres for the cultivation of jatropha — a plant many experts say is the most promising source for biodiesel. At the same time, companies from Europe and India have begun buying up land throughout Africa to establish jatropha plantations.

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As American farmers plan to plant the most corn since World War II to cash in on ethanol, which is added to gasoline, much of the rest of the world is turning to jatropha, which is used as a substitute for diesel fuel.

The two are not competitors, since neither can be used in the other type of fuel. But jatropha is fast emerging as a candidate for the ideal biofuel. It is grown in wastelands, needs relatively little care or refinement, and is inedible — meaning it will not take food from the poor for the gas tanks of the rich.

But Mr. Sethia's modest plantation is a reminder that jatropha has a long way to go. Although Sethia's home state of Chhattisgarh has been one of India's leading jatropha promoters, industries say it could be years before they begin production here. Until then, Sethia laments, the \$1,500 he has invested in jatropha has been wasted.

Globally, experts worry that the story could be similar. Lured by jatropha's potential, nations and corporations have acted rashly, coming to the "idea that it is the final answer for many problems," says Kees Daey Ouwens of Fuels from Agriculture in Communal Technology (FACT) in Eindhoven, The Netherlands.

It could be. But it is too early to tell. "Jatropha is very promising," he says. "But there is not enough information ... to start on such large scales."

There is no estimate as to how much jatropha is being cultivated globally, but anecdotal evidence suggests that the trend is accelerating:

- The government-owned China National Offshore Oil Corp. (CNOOC) is planning to have 80,000 acres of jatropha in Sichuan Province alone by 2010.
- Renova Biodiesel of Brazil is expected to plant 60,000 acres of jatropha, and reports suggest that other oil companies are considering planting nearly 500,000 acres in the next four years.
- D1 Oils, a British company that is considered by many to be the leader in jatropha cultivation, has plantations from Swaziland to Indonesia, and hopes to nearly double its 385,000 acres of jatropha worldwide by the end of 2008.
- The Philippine National Oil Co. recently earmarked \$14 million for jatropha planting and production, while Indonesia plans to set up 52 biodiesel plants across the country at a cost of \$7.3 million.

The cause of the excitement is both environmental and economic. The European Union has mandated that by 2020 all cars must run on 20% biodiesel, which burns cleaner than fossil fuels. A 1998 study, jointly sponsored by the U.S. Department of Energy and the Department of Agriculture, concluded that biodiesel reduces net carbon-dioxide emissions by 78% compared with petroleum diesel.

Meanwhile, Asian economies are desperately seeking natural resources to support their growth. India, for example, imports 70% of its fuel, and its planning commission has prioritized the study of domestically grown biofuels in an attempt to become more self-sufficient.

Jatropha is a natural answer. The leafy bush thrives in arid regions around the equator, has no use as food, and takes little refinement: a hydraulic press to squeeze the oil from the seeds, and a chemical solution to create and filter the fuel. When the necessary infrastructure is in place — sufficient farms, transport routes, and processing plants — jatropha oil could be no more expensive than regular diesel.

"In 10 years, the production prices will not be much different," says Mr. Daey Ouwens.

Along with several other states, Chhattisgarh has responded with massive planting campaigns and incentives for farmers, including 500 free saplings. Sethia received a \$250 loan for planting jatropha, as well as a commendation from the state. The problem is, there's no market here in the Indian outback.

The state says it will buy the seeds, which then must be crushed to create the oil. But Sethia says he would need to take his harvest to the capital, which is a half-day drive, at least. The cost of getting them there would outstrip any possible profit.

Then there's the fact that jatropha needs more care than he had anticipated. He has let most of his crop fend for itself. After two years, the plants are knobby fingers less than a foot tall. A few plants, however, he planted in a ruddy dirt embankment near a seasonal pond and tended regularly. Their leafy branches arch higher than Sethia himself and are already yielding seeds.

Right now, he says, the economics don't work. "But if there is a [processing] plant nearby, farmers will grow it, because there is the assurance that they will be able to sell it," he says. As it is, he knows of only one other person in the district growing jatropha.

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For their part, oil industries are interested in building processing plants. But it will be several years before there is a critical mass in Chhattisgarh – about 50,000 acres – to justify the costs. "That has to come up," says B. B. Choudhary of Indian Oil. "It has not yet."

Yet there is also a danger in industries pushing too fast, experts say. *Jatropha* cultivation is so new that scientists know little about it, such as ideal conditions for growth, susceptibility to disease, or expected yields per acre. Some critics even suggest that toxic strains of the plant can cause health problems for workers.

The Energy and Resources Institute in Delhi has set up plantations across India to study these issues for British Petroleum. In four years, all these knowledge gaps will be filled in, argues Alok Adholeya, who manages the program.

He advises farmers like Sethia to remain patient. "If they are patient enough, they will find some buyers very soon, because the message is getting out."

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