

**JATRO
POWER**



JATROPOWER AG – Profile

Development of Jatropha elite seeds since 2008

Strategic focus on development of high yielding non-toxic Jatropha cultivars

Commercial quantities of Jatropha seeds available for sale at competitive prices

First company to offer high yielding non-toxic and F1 hybrid Jatropha seeds in the market

Provider of cultivation expertise

Read inside:

Background on the company

Jatropha genetic improvement achieved

The advantages of non-toxic jatropha

- as a multi-product crop
- financial advantages of non-toxic jatropha over toxic

Hybridisation programme



Jatropower seed production orchard near Coimbatore, India





Background

Jatropower founded in Switzerland in 2007. Research and development work on *Jatropha curcas* based in India since 2008. Early 2014, Jatropower took over the selected elite genotypes and certain technologies for further development of these from Quinvita BV, Belgium which was active in *Jatropha* genetic improvement since 2006. Combining the two activities, Jatropower now owns a unique selection of proven elite accessions of *Jatropha curcas* selected from a global germplasm collection of 650 provenances, representing all major global *Jatropha* hot-spots (Central America including Mexico, SE Asia and India, Africa and Madagascar).

Jatropower has its main research and development activities and seed orchards spread over 12 farms in India and has experimental farms in Kenya.

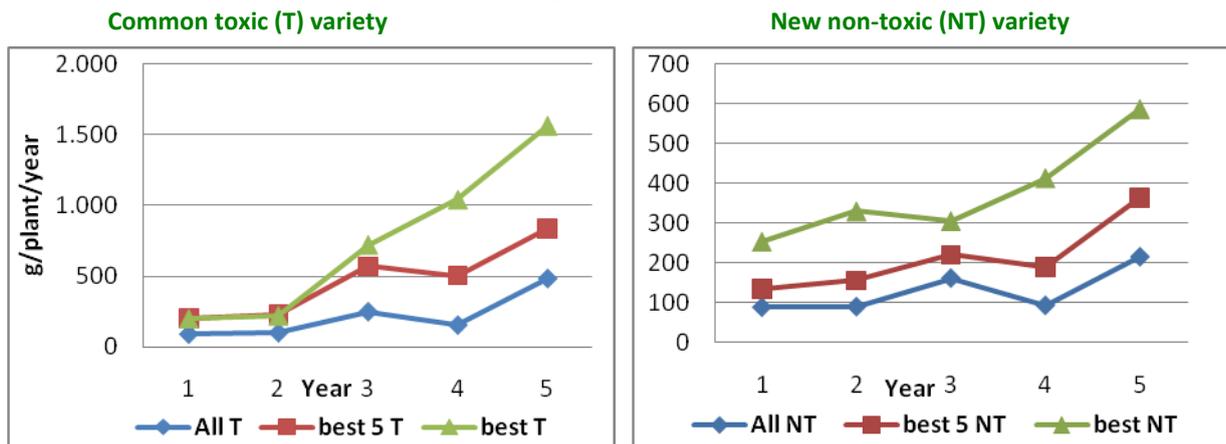
Jatropower's seed production orchards in India can produce and supply commercial quantities of elite *Jatropha* seeds on order. These elite seeds are being assessed at client sites in Mali, Burkina Faso, Mozambique, Ghana and Panama.

At some sites, these seeds have been used to establish the first commercial plantations, making Jatropower the only producer with such commercially marketed seed material in the *Jatropha* sector.

"Jatropha remains one of the best options to viably produce fuel oil on a large scale from disadvantaged areas"

High yielding character of selected elite accessions could be proven over 5 years

Best plant with 3 – 4 times higher yield than the average of all accessions



note: year 4, 5 = drought years—annual rainfall below 200 mm

Semi-arid climate and degraded soil framework under which these yields have been obtained:

Rainfall: average below 400 mm p.a.	Texture: stony
pH: 8.2	Fertility: deficient in N and P and micronutrients such as B and Fe
Soil depth: 30 cm	
Irrigation: 14 litres every 14 days during rain-free months	

Note: planted on non-degraded deep soil under higher rainfall conditions (> 1200 mm/pa well distributed over 6-8 months) or under irrigated conditions yields higher by a factor of two could be possible.

The best performing non-toxic plant is smaller in size (see picture on the opposite page) and hence could be planted at higher intensity, resulting possibly in similar yields per ha basis compared to the elite toxic plant.

Strategic focus—Non-toxic jatropha



Development of non-toxic Jatropha using state-of-the-art agronomic and genetic analysis techniques.

Suitable markers developed to differentiate non-toxic from toxic plants early.

The non-toxic markers identified in Jatropower research have already been made available to the Jatropha community through a refereed publication (Plant Science 207 (2013) 117– 127). New results on markers for the toxicity trait can be seen on the poster presented at PAG 2016 at San Diego, California.

Jatropower found that the inheritance pattern of the non-toxic trait follows a Mendelian pattern and hence wild collected seeds may be non-reliable to raise a plantation of

Non-toxic jatropha

Occurs naturally in Mexico.

Only slightly different to toxic jatropha in appearance

- Leaf shape
- Long fruit stalk
- Slightly oblong fruits.

Toxic phorbolsters present in toxic jatropha absent in the edible varieties.

The seed kernel meal is edible and has been proven to be valuable protein source in animal and fish feeds (crude protein content higher than in soybean meal).

Each kg of oil produced from edible jatropha results in 0.75 kg of high quality kernel meal.

Cultivation of non-toxic jatropha can result in considerably higher revenue per ha per year provided selected cultivars with yields comparable to elite toxic varieties are used.



Size comparison of four year old selected elite non-toxic plant (left) and the selected elite toxic plant (right)

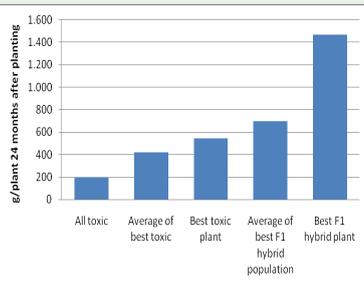
Jatropha hybrids

Jatropower is evaluating F1 hybrids and derivatives from over 25 elite x elite crosses of jatropha accessions.

Markers developed help confirm hybrids early.

JP 286, an F1 hybrid, showed almost 100% hybrid vigour as far as seed productivity is concerned compared to the respective parents.

Jatropower has established 2 hybrid seed production farms and will start marketing F1 hybrid jatropha seeds in 2016.



* data is average of 6 replicates for the hybrid and 8 replicates for parent stock from their respective first year yields.



One year old JP286 hybrid Jatropha curcas plant

Contact

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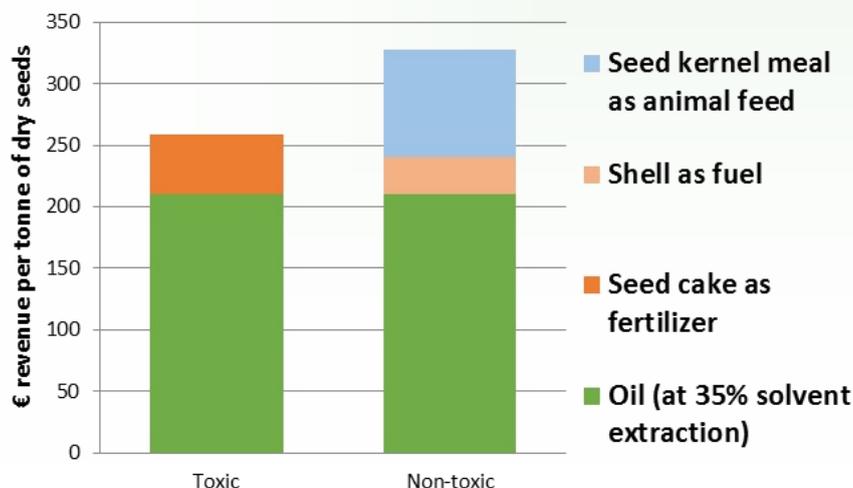
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Non-toxic business model

The following approximation based on a Jatropha oil price of 600 €/tonne shows the level of impact on the revenue stream (average per ton of dry seeds):



Assumptions: The toxic seed cake can at best be used as fertilizer. It is usually not suitable as fuel because of high N content. The 75€ / tonne assumed is the expected price; non-toxic jatropha kernel meal price is assumed to be 350€ / tonne; jatropha shell has a calorific value of over 18MJ/kg and hence valued at a minimum price of 75€ / tonne.

Jatropower—Products and Services

Elite Jatropha curcas seeds for plantation projects at extremely competitive prices

- 7 elite cultivar seeds available in store.
- The first commercial elite non-toxic jatropha cultivar seeds marketed since 2015.
- 2 elite F1 hybrid jatropha seeds to be available in 2016.
- Second generation elite non-toxic derivative seeds being evaluated.

Business plan development and due diligence for new projects.

Plantation site evaluation and feasibility studies.

Jatropha seed processing.

Seed and oil quality control.

More information at www.jatropower.ch

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