

# The first variety of jatropha 'Chhatrapati' released

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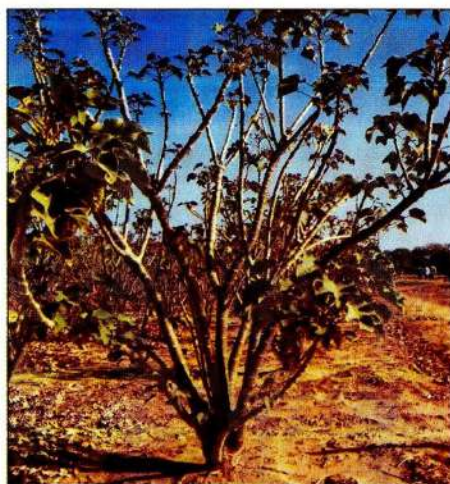
*Bio-diesel is either a fatty acid or methyl ester obtained from virgin or used vegetable oils (edible and non-edible) and animal fats. Though, it does not contain petroleum but can be blended with petroleum and diesel or can be used in its pure form. The use of bio-diesel in conventional diesel engines has significance to have pollution free environment since it helps in substantial reduction of unburnt hydrocarbons, carbon monoxide and particulate matters. The bio-diesel has almost no sulphur and aromatics and has about 10% built-in oxygen that helps to burn it fully. In India, the non-edible vegetable oils can be the suitable feed stock in production of bio-diesels. There are several plant species which can be used for extraction of non-edible oils. However, on account of its wider adaptability, jatropha (Jatropha curcus) can be the best choice. Therefore, it was considered to be desirable that a suitable variety be identified among different selections and collections of the available material through All India Co-ordinated Research Network on Underutilized Crops.*

**J**ATROPHA CURCUS is a drought-resistant perennial plant growing well in marginal and poor soils. It is easy to establish, grows quickly and may survive for several years producing seeds. It produces seeds with an oil content of 37%. The oil can be combusted as fuel without being refined. It burns with clear smoke-free flame, tested successfully as fuel for simple diesel engine. Its by-product, the press cake is a good organic fertilizer and the oil can be used as an insecticide as well.

It is found to be growing in many parts of the country, rugged in nature and can survive with minimum inputs. It propagates easily either through seeds or cuttings.

Medically it is used for diseases

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like cancer, piles, snakebite, paralysis, dropsy etc. Jatropha grows wild in many areas of India and even thrives on infertile soil. A good crop can be obtained with little efforts.

Depending on soil fertility and rainfall, the oil can be extracted from the jatropha nuts even in the same year if planted through cuttings. The annual seed yield generally ranges

from 0.5 to 1.2 tonnes per ha. The kernels consist oil to the extent of about 60% which can be transformed into bio-diesel through esterification.

It is still uncertain about its centre of origin, but it is believed to be Mexico and Central America. It has been introduced to Africa and Asia and is now cultivated world-wide. This highly drought-resistant species is adapted to arid and semi-arid conditions. The current distribution shows that introduction has been most successful in the drier regions of the tropics with annual rainfall of 300-1000 mm. It occurs mainly at lower altitudes (0-500 m) in areas with average annual temperatures well above 20°C but can grow at higher altitudes and tolerates slight frost. It grows on well-drained soils with good aeration and is well adapted to marginal soils with low nutrient content.

A variety 'SDAUJ-1' named 'Chhatrapati' developed at Sardar

**Table 1.** Mean seed yield (tonnes/ha) of jatropha genotypes tested for four years

Genotype**	2001		2002		2003		2004				Weighted performance				
	S K Nagar	Bhubaneswar	S K Nagar	Mean	Bhubaneswar	Hisar	Mean	Rahuri	Bhubaneswar	Hisar	Mean	Mean	Frequency of superiority over check	Rank	Percentage increase/decrease over trial mean
'Hansraj'	0.04*	0.10*	0.69*	0.39	0.16*	0.27	0.21	0.28	0.21	0.27	0.25	0.25	4/8		-11.31
'S.K. Nagar' (Big)	0.04*	0.12*	0.75*	0.43	0.25*	0.27	0.26	0.40	0.30*	0.27	0.32	0.30	5/8	II	5.87
'Urlikanchan'	0.04*	0.12*	0.61*	0.36	0.22*	0.30	0.26	0.36	0.35*	0.30	0.34	0.29	5/8	III	1.24
'Chhatrapati'	0.05*	0.14*	1.01*	0.57	0.28*	0.40*	0.34	0.33	0.27*	0.40	0.33	0.36	6/8	I	27.21
Local (Ch)	0.02	0.07	0.17	0.12	0.11	0.33	0.22	0.42	0.18	0.45	0.35	0.22	-		-23.01
Trial mean	0.04	0.11	0.64	0.38	0.20	0.31	0.26	0.36	0.26	0.34	0.32	0.28			
CD (0.05)	0.01	0.015	0.12		0.01	0.04		0.05	0.04	0.03					

**Table 2.** Mean kernel oil content of jatropha genotypes

Genotypes	Oil (%)	Rank
'Hansraj'	56.2	III
'S K Nagar' (Big)	56.2	III
'Urlikanchan'	55.1	
'Chhatrapati'	57.7	I
Local (Ch)	56.6	II

Krushi Nagar Dantiwada Agricultural University, S K Nagar from indigenous collections of Gujarat region, identified by Variety Identification Committee at All-India Co-ordinated Research Network on Underutilized Crops Group Meet and

released by Central Sub-Committee on Crop Standards, Notification and Release of Varieties, in its meeting held on 20 November 2006, was tested along with other four genotypes over a period of 4 years after planting during 2000 at 4 centres of AICRN. Year wise data were received from different centres depending upon the climatic conditions and the crop coming in flowering and fruiting (Table 1). The principal quantitative characteristics, viz. seed yield (tonnes/ha), plant height, stem girth, 100 seed weight, number of primary branches and oil

content were observed to be superior in this variety than all other genotypes. The distinguishable characteristics of this variety are high yield and oil percentage. The variety gave consistently high yield (Table 1) over other popular genotypes at various locations of AICRN centres indicating good adaptability and stability for high grain yield. It had performed significantly better than the check at 6 out of 8 locations and gave an average seed yield of 0.36 tonne/ha/ year. The estimate of oil content (Table 2) indicated that 'Chhatrapati' had higher oil content

**Table 3.** Mean 100-seed weight (g) of jatropha genotypes tested during four years

Genotype	2001		2002		2003		2004				Weighted performance			
	S K Nagar	Bhubaneswar	Hisar	Mean	Bhubaneswar	Rahuri	Bhubaneswar	S K Nagar	Hisar	Mean	Mean	Location	Rank	Percentage increase/decrease over trial mean
'Hansraj'	5.40	48.61	48.28	48.45	48.55	49.07	49.30	44.79	50.50	48.42	43.06	8		-6.87
'S K Nagar' (Big)	43.83	42.95	47.65	45.30	43.04	42.71	45.25	43.18	56.85	47.00	45.68	8	III	-1.21
'Urlikanchan'	59.49	51.26	54.29	52.78	51.23	51.17	52.14	36.05	48.31	46.92	50.49	8	II	9.20
'Chhatrapati'	52.66	49.91	53.12	51.52	50.16	50.78	47.32	45.93	54.30	49.58	50.52	8	I	9.26
Local (Ch)	29.34	30.12	35.52	32.82	38.22	41.97	51.35	44.78	60.40	49.63	41.46	8		-10.33
Trial mean	38.14	44.57	47.77	46.17	46.24	47.14	49.07	42.95	54.07	48.31	46.24			

(57.7%) than other genotypes. It also had higher 100-seed weight (50.52 g) than other genotypes. Considering higher potential yield and other desirable traits, the variety identification committee on underutilized crops identified this variety for consideration of notification for cultivation in states of Gujarat, Orissa, Haryana and Maharashtra in May 2006. Accordingly this genotype was released by Central Sub-committee on Crop standards, Notification and Release of Varieties in November 2006.

It is resistant to major diseases.

However, the incident of the root rot (Microphomina) may occur when the soil temperature fluctuates. The disease can be controlled by drenching with 1% bordeaux mixture. However, it is resistant to all major pests. It is also resistant to lodging by virtue of its being shrub/small tree nature. It gives response to application of fertilizers and N:P:K @ 45:30:00 kg /ha is recommended for good yields. The spacing at 2 m × 2 m (2,500 plants/ha is recommended) under rainfed conditions. It shows resistance to water stress and drought conditions as well.

#### **SUMMARY**

So far, jatropha is being propagated with the heterogeneous material collected from the wildy grown plants. The release of this variety will strengthen the seed production programme in jatropha to have uniform and homogeneous seed/ propagating material to have proper stand of the crop in fields to get higher productivity in the crop. Since this variety has performed better over the locations across different agro-climatic conditions, it can be grown successfully in different regions with its wider adaptability.

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