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Journey of Niger from undulated lands to the plains

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Niger [Guizotia abyssinica (L.f.) Cass.], popular among tribals, plays an important role in ensuring nutritional security. It is known as ramtil (Hindi), karale or khurasani (Marathi), uhechellu (Kannada), payellu (Tamil), verri nuvvulu (Telugu), alashi (Oriya) in different parts of the country. It is grown mainly in tropical and subtropical countries like India, Ethiopia, East Africa, West Indies and Zimbabwe. It is important in terms of its oil quality (32–40%) protein in the seed (18–24%). Niger is valued for its polyunsaturated fatty acid rich oil. In India, this crop is mainly grown by tribals on marginal, unproductive, undulated and wastelands without any production management under rainfed conditions mainly in Madhya Pradesh, Chhattisgarh, Odisha, Andhra Pradesh and Karnataka.

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NIGER seed is highly rich in protein and fatty acids. It is a good source of linoleic acid and consists of essential nutrients like niacin, oleic acid, carbohydrates, protein, fibers, stearic acid, riboflavin and ascorbic acid. It can be used as a substitute for olive oil. Niger seed meal is reported to be free from any toxic substance and contains more crude fiber than most of the other oilseed meals. Whole plants are used as green manure in the pre-flowering stage. These are used as 'bee plants'. Niger has an advantage of yielding oil and has good degree of tolerance to diseases, insect-pests and attack of wild animals. It also forms an excellent intercrop with wide range of other oilseed and non-oilseed crops. The crop is widely adapted to all types of soil and is commonly grown in India on poor and acid soils or on hilly slopes that are low in fertility. Though India accounts for only 3% of niger oilseed production, it ranks first in area, production and export of niger as bird feed in the world, therefore, the world markets will continue to be influenced by niger production and marketable surplus. It is grown on an area of about 1.94 lakh hectares with annual production of 0.71 lakh tonnes and productivity of 334 kg/ha (2018–19).

As the crop is grown largely by tribal farmers, it has remained neglected. Because the productivity was low, the area under niger cultivation in India decreased considerably since last two decades. The low yield is due to poor seed set resulting from protrandrous self-incompatibility, shattering nature, low harvest index, non-determinant

View of Farmer's Field

types and cuscuta infestation. However, with the help of research and intervention of scientists, the yield of the crop has increased significantly and farmers have started cultivating this crop as per improved management practices. Madhya Pradesh ranked third in area and production during 2018–19. Despite low productivity and production, the contribution to the export earnings has been encouraging. India could earn the foreign exchange of ₹105 crores by export of niger seed and the oil meal. India is the largest exporter in the world; USA, Netherlands, Italy, Germany, Belgium and Spain are the regular buyers.

AICRP on Niger, Chhindwara, Madhya Pradesh

AICRP on niger initially started in 1972 at Jabalpur and later shifted to Chhindwara in 1982 for the development of more seed and high oil yielding varieties of niger for rainfed ecosystem. Out of 23 varieties developed so far under AICRPs, five varieties, viz. JNC-1, JNC-6, JNS-9, JNS-28 and JNS-30 have been developed at Chhindwara and are still in active seed chain. Varieties evolved by JNKVV are covering more than 30% area in the country. Variety JNS-9 has been designated as national check due wide adaptability across the states and country.

Success story of Mr Dinesh Maheshwari: A farmer

Mr Dinesh Maheshwari resident of village Kudarai, Hoshangabad, Madhya Pradesh is a progressive farmer. His village is situated at 78°50' altitude and 22°77' latitude and at 331 msl in Central Narmada valley region, situated 95.6 km away from the river Narmada and in north part of Satpura plateau. The average rainfall is 1343.6 mm during the period June to September

Mr Maheshwari along with his two brothers has 100 ha of irrigated land on which they usually grows soybean/moong, urd during *kharif*. But it is being observed by the farmers that soybean crop in these black soils invariably gets damaged due to heavy rains and severe infestation of yellow mosaic virus. He approached JNKVV scientists at Chhindwara and came to know about the potential of niger crop which he could take up during late *kharif* with minimum risk of heavy rainfall and damage by insect pests and diseases. He showed his keen interest in growing niger crop. Seeds of JNS-28 variety of niger were made available to the farmer from AICRP Chhindwara under Seed Hub programme of GoI for an area of about 100 ha. He followed all the recommended management practices to grow the crop. Also time to time technical support and information regarding improved technology was provided by scientists of Project Coordinating Unit (Sesame and Niger), Jabalpur.

A field day for farmers was organized on 2nd November 2019 at the farmers' field in collaboration with the Department of Agriculture, Hoshangabad and JNKVV, Jabalpur. This was for the first time that niger

Farmer in Niger field

an overlooked crop mostly grown on undulated and unproductive lands by the tribals was taken on the plains in such a large area. Farmers of his village as well as from nearby villages visited his field, and were very impressed with the new crop and variety as well as new technology of cultivation.

Output

By the improved cultivation practices and use of high yielding variety JNS-28, the farmer harvested 9.25 q/ha niger in comparison to previous crop of soybean (13.2 q/ha) (Table 1). He also fetched an additional income of ₹2500 per ha from honey harvested from beehives.

Impact of niger cultivation

Most of the farmers were convinced with the improved

Field day organized in Hoshangabad, Madhya Pradesh

technology. Now, farmers of Hoshangabad and Harda district are showing keen interest and have started growing this crop (cultivar JNS-28 and JNS-30) (*kharif* 2020) with improved technology of cultivation in an area of about 1200 ha. Also the total seed produced i.e. 925–930 q by the farmers has been procured by the Agricultural State Department, Madhya Pradesh and distributed to the farmers of tribal belt as well as plain land. Increase in MSP gave an additional encouragement to the farmers to take the crop even in plains.

Table 1. Economics of niger vis à vis soybean cultivation

Seed yield (kg/ha)		Cost of cultivation (₹/ha)		Gross income (₹/ha)		Net Return (₹/ha)	
Niger	Soybean (previous crop)	Niger	Soybean (previous crop)	Niger	Soybean (previous crop)	Niger	Soybean (previous crop)
925	1,320	14,500	18,500	54,945	43,560	40,445	25,060

Sale price of niger (MSP): ₹5940/ha; Sale price of Soybean: ₹3,300/ha

SUMMARY

Due to the wide adaptability of the variety JNS-28, now this crop is being grown in plains also. This crop can replace soybean crop in plains up to certain extent as soybean crop is no more economical to the farmers of this belt. The farmers fetched 9.25 q/ha seed yield in niger crop which is almost double the productivity of the Madhya Pradesh state and additional income of ₹15385/ha over the soybean crop. The shifting of the crop from the hilly areas to plain land is a very big achievement as the farmers earlier were not very confident about the crop. But as the farmers observed that niger has the withstanding capacity of heavy rains and stagnant water up to 2–3 days it can be taken up as a replacement to soybean crop. The same initiative can be replicated as cluster demonstration in other niger growing states, viz. Odisha, Chhattisgarh, Andhra Pradesh, Bihar, Jharkhand and Karnataka.

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