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Niger- A High value oilseed crop for HAT zone of A.P.**P.V.S. Ramunaidu, P. Babu, A. Sowjanya, N. Raja kumar, N. Sathibabu,
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Krishi Vigyan Kendra, Kondempudi, Anakapalle, ICAR-ANGRAU****Corresponding author: pvsramunaidu5075@gmail.com****INTRODUCTION**

Niger (*Guizotia abyssinica* L.), a minor oilseed crop, is suitable under rainfed, less fertile soil. Niger seed which can be used as a human food contains 37-47% oil. The oil is pale yellow in colour with a pleasant odour and taste is similar to desi ghee. The oil contains higher amount of unsaturated fatty acid (oleic acid 38% and linoleic acid 51.6%) and is free from toxins. The niger oil is having various uses viz., (i) the oil is used for culinary purposes; (ii) for lighting and as lubricating oil; (iii) manufacturing of paints and soft-soaps; (iv) in perfume industry, it is used as a base oil as because the niger oil is a good absorbent of fragrance of flowers; (v) niger oil is having medicinal properties for which it is used for body massage and treatment of many diseases; (vi) niger seed cake is a valuable cattle feed particularly for milch cattle; (vii) niger seed cake can also be used as a manure. Besides, the crop can also be grown as green manure crop for increasing the soil productivity India rank first with a contribution of more than 50% of world niger area and production. For increasing productivity of niger CFLD's conducting by Krishi Vigyan Kendra Kondempudi in Alluri Seetharama Raju district of Andhra Pradesh. Several factors lend credence to choose the niger crop by the farmers of HAT zone of A.P. (1) it can tolerance poor soil and drought, (2) animals do not relish it, (3) no serious pests and diseases are there so as to cause economic losses to the crop, and as such no plant protection measures are required under Assam condition (4) with vigorous growth habit, niger can easily compete with annual weeds, (5) seeds can be stored for a year or more without deterioration, and (6) seeds mature 100-110 days after planting.

Site selection and sowing of niger

Niger can grow in a wide range of soil types, but cannot hold up well in water logging. The crop thrives best on silt loam to sandy loam soil with 5.2 to 7.3 pH range. The crop can be cultivated in upland as well as in medium low-land with good drainage capacity. Niger crop sown after the harvest of sali rice by mid November can utilize the rainfall due to North-east monsoon in Andhra Pradesh. Growing of this second crop after rice improves the land use efficiency of a vast tract of rice fallow and adds organic matter to soil. Sowing period for niger in HAT zone of A.P. is Mid August – Mid September. Optimum sowing time for kharif niger is from mid of June to early August. However, farming community of HAT Zone of A.P. prefers to cultivate niger as a rainfed rabi crop.

Varieties:

Niger varieties recommended for different states of India are shown in Table 1. Suitable varieties under Andhra Pradesh condition are- JNS- 30, KRN-1 (No. 71), BNS-10 (Pooja-1), JNS-30 variety is recommended for HAT Zone of Andhra Pradesh. Field for cultivation of niger crop should be prepared for fine tilth by 3-4 ploughings followed by laddering. Furrows of 5 cm depth were prepared at 25 cm apart and seeds were placed at 3-5 cm depth at the rate of 8 kg ha⁻¹. Then laddering was done along the furrows to cover the seeds with a soil layer of about 3-5 cm to ensure compaction of soil for getting quick and uniform germination. In case of broadcasting method of sowing, broadcasting should be uniform to get well distributed plant population (Milli *et al.*, 2012). However, this method requires a higher seed rate of 12 kg ha and this also creates difficulties in inter cultural operations. Hence, farmers are advised to follow the line method of sowing.

Table 1: Niger varieties recommended for different states of India.

State	Variety
Andhra Pradesh	JNS- 30, KRN-1 (No. 71), BNS-10 (Pooja-1), Birsa Niger-3
Madhya Pradesh	Birsa Niger-1, Birsa Niger-3, N-5, Ootacamund, Jawahar Niger Composite-1, JNC-6, JNC-9, BNS-10 (Pooja-1)
Bihar	BNS-10 (Pooja-1), Birsa Niger 1, N-5, Ootacamund

West Bengal	KRN-1, Sahyadri, BNS-10 (Pooja-1), Birsa Niger-3
Orissa	GA-10 (Shiva) (Deomali), Birsa Niger-3, Bhavani (GA-5), Sahyadri, KRN-1, BNS-10 (Pooja-1), Utkal Niger-150
Rajasthan/Maharashtra/ Uttar Pradesh	IGPN-2004-1 (Phule Karala-1), Sahayadri (IGP-76), BNS-10 (Pooja-1)
Karnataka	KBN-1, DNS-4, Shrilekha, BNS-10 (Pooja-1), IGPN-2004-1
Gujarat	RCR-317, BNS-10 (Pooja-1), Gujarat Niger-1, NRS-96-1
Tamil Nadu	Paitur-1, KRN-1, BNS-10 (Pooja-1)
Assam	Local (NG-1), GA-5, KEC-3

Seed rate and sowing:

Generally, 5 kg/ha seed is required for sowing of sole crop.

Seed should be treated with Thiram or Captan @ 3.0 g/kg seed before sowing. Seed treatment with 10 g/kg Azatobactor, 8 g/kg Trichoderma and 10 g/kg PSB enhances the income by 20%.

Land should be prepared thoroughly by giving 3-4 ploughings followed by laddering to obtain a fine tilth. The crop is largely sown by broadcasting. Seeds are mixed with sand/ powdered FYM/ ash to increase the bulk, 20 times to ensure even distribution of seed. Line sowing has been found beneficial with spacing of 30cm x 10cm. Furrows of 5 cm depth are to be prepared at 25 cm apart. Seeds are to be placed in furrows preferably at 3-5 cm depth. Then laddering should be done along the furrows to cover the seeds with a soil layer of about 3-5 cm. This ensures compacting of soil resulting in quick and uniform germination.

Nutrient Management:

The crop is mostly grown on marginal and sub-marginal land without manure or fertilizer application. However, application of recommended N through urea + seed treatment with PSB 10 g/kg seed enhances yield significantly. Application of sulphur (20-30 kg/ha) increases seed yield and oil content in niger.

Recommended dose: 5 tonnes of FYM and 10 kg N/ha at sowing

Weed Management:

- First weeding is needed 15-20 days after sowing. In Odisha, (*Cuscuta hyalina/ C. chinensis*) infestation has become a major problem. Seed should be obtained from Cuscuta free areas. Cuscuta seeds could be separated with a 1 mm sieve.
- Pre sowing soil application of Fluchloralin (1 kg *a.i./ha*). or Pre emergence application of Pendimethalin (1.5 kg *a.i./ha*).

Water Management:

It is invariably grown in the rainy season and it is seldom irrigated. There are indications that niger yields can be doubled under irrigation, if the crop suffers from moisture stress. Irrigation may be given at the seedling stage.

Bee Pollination:

Through increased pollination, 5 honeybee colonies/ha of niger is recommended.

Harvesting:

Niger usually matures in 95-105 days after sowing. The crop should be harvested when the leaves dry up and the capitula turns brownish / blackish in colour.

Average Yield:

- Pure crop – 400-500 kg/ha
- Intercrop – 150-300 kg/ha

Quality considerations

- Niger seed contains 35-40% oil, ash 4 - 5.8%, 20% - protein, crude fibre content is 10%
- Niger oil is pale yellow, nutty in taste and sweet odour, and low acidity in raw oil hence used in cooking.

- Linoleic acid is major fatty acid, followed Oleic acid also.
- Niger cake contains 24-34% protein, 4-14% oil, 8-24% crude fibre, 20-28% sugar and 8-12% ash.

Economic importance

- 75% of niger seed produced is used for extraction of oil in India, and rest is used for food in confectioneries making, also Exported to western countries as cage bird feed
- Consumed by sheep
- Niger also used as green manure
- Niger seed cake is a valuable cattle feed
- Niger seed is used as human food
- Oil is subjected to oxidative and rancidation, reducing its keeping quality poor, due to high Oleic acid (38%) and linoleic acid (51.6%).
- Oil is used for culinary purposes
- Used for manufacturing paints and soft-soaps and cosmetics
- Niger oil is used as a base oil in perfume industry
- Niger oil is use for pharmaceutical purpose
- Niger based agar medium which is required for brain ailment.

Conclusion:

Niger is a high value oilseed crop and as it also cultivated for aesthetic purpose which develops tourism in Araku valley of Visakhapatnam. As there is a scope for increasing the niger production by following proper agronomic measures and various inputs provided by the Krishi Vigyan Kendra, Kondempudi through CFLD will be of most importance value for getting higher production in HAT zone of Andhra Pradesh.

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