



## JNS-28 : A HIGH OIL AND SEED YIELDING PROMISING GENOTYPE OF NIGER [*GUIZOTIA ABYSSINICA* (L.F.) CASS.]

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### Abstract

Niger [*Guizotia abyssinica* (L.F.) Cass.] is a hardy, rainfed crop, which receives very little attention by way of manuring or irrigation. The seed is used mainly for extraction of oil which is about one third of the seed weight. The high grain yielding variety with high oil is today's requirement JNS-28 is a high grain (617 Kg/ha) as well as high oil yielder (208 Kg/ha). It recorded 30.5 per cent increase in grain yield and 20 per cent increase in oil on the basis of in three year testing in AICRP trial. It is a selection of local germplasm collected from tribal area of Chhindwara district of M.P., India. It has high oil content 33 to 36%, high test weight 4.2-4.5 gram, high capitula/plant, 95-105 days to maturity, resistant to cercospora and alternaria leaf spot, field tolerant to powdery mildew, aphids, semilooper and caterpillar. It has been recommended by the varietal identification committee for national release during annual group meeting of AICRP on Sesame & Niger 2013-14.

**Key words** : Niger [*Guizotia abyssinica* (L.F.) Cass.], protein, oil content, grain yield, aphids.

### Introduction

It is widely grown due to its increased demand and lower cost of cultivation. It has great elasticity of adaption under various stresses and considerable potential.

Niger [*Guizotia abyssinica* (L.F.) Cass.] for domestic and industrial uses. It is grown by tribal's on marginal and sub marginal land with the negligible inputs under rain fed condition. Niger consistent as a minor oil seed crop is important in terms of its genotype oil and protein in seed.

The oil is bluish-white in colour, with a paint colour and sweetish taste. It is used for culinary purpose, for anointing the body, for paints and soaps, for illumination and also for alteration with other more valuable vegetable oil. The oilcake is well-known cattle feed in Niger growing areas. The cake is considered as a good feed for milch lows and is there for selection used in manure. The seed may be eaten fried powdered smelled with flour to make sweet cakes. The seed is also used as bird feed in western countries.

The objective to evolve JNS-28 is high grain yielding, medium maturity and high oil content with tolerance to major diseases and pest.

### Materials and Methods

JNS-28 is a selection from local germplasm collected from tribal areas of Chhindwara district of M.P., India using mass selection breeding method. The germplasm collection was done by the breeder and evaluated at Research farm of the JNKVV Zonal Agricultural Research Station, Chandangaon, Chhindwara (M.P.), India.

The genotype after tested in local station trials, it is included in Initial Variety Trial All India Coordinated Research Project under during 2008-09. On the best performance Advanced Varietal Trial (2009-10) and Advanced Varietal Trial (2010-11). It is promoted to finally, it was recommended for national release by Variety Identification Committee during annual workshop 2013-14 at ANGRAU Hyderabad.

### Results and Discussion

The genotype JNS-28 was included in IVT in AICRP trials in 2008-09. It was tested at 10 location, which recorded 616 Kg per ha grain yield performing 32.5 percent higher than national check variety IGP-76 (Annual Report, 2008-09) at during 2009-10, in AVT first year it recorded 621 Kg grain per ha which was 26.7 percent more than national check (Annual Report, 2009-10).

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**Table 1** : Summary of seed yield (kg/ha) of coordinated trials- *Kharif* 2008-09 to 2010 -11 (AICRP trials).

Name of proposed variety: JNS 28

Adaptability Zone: All India Production condition: *Kharif* rainfed

Items	Year of testing	No. of trials/ locations	Proposed variety JNS-28	Check variety IGP - 76	Qualifying entries					
					PCN-08	JNS-30	JNS-10	DNS-4	BNC-15	C.D
Mean seed yield kg/ha	1 <sup>st</sup> year 2008-09 IVT	10	616	465	629	659	557	534	497	30.8
	2 <sup>nd</sup> year 2009-10 AVT	11	621	490	509	588	620	586	465	61.7
	3 <sup>rd</sup> year 2010-11 AVT	8	613	459	588	547	582	545	495	22.7
	Weighted mean	29	617.1	472.8	572.2	601.2	587.8	556.8	484.3	-
% increase/ decrease over checks/qualifying entries	2008-09			+32.5	-2.1	-6.5	+10.5	+15.5	+23.9	-
	2009-10			+26.7	+22.0	+5.6	+0.2	+6.0	+33.5	-
	2010-11			+33.5	+33.6	+4.2	+12.1	+5.3	+12.5	-
	Weighted mean	-	-	30.5	7.8	2.6	4.9	10.8	27.4	-
Frequency to top in group	2008-09		6/10	4/10	2/10	4/10	0/0	1/10	1/10	-
	2009-10		9/11	3/11	1/11	1/11	3/11	2/11	0/11	-
	2010-11		3/8	1/8	1/8	0/8	3/8	0/8	0/8	-
	Total		18/29	8/29	4/29	5/29	6/29	3/29	1/29	-

\*Mean data excludes locations below national average.

Ref. Annual report, Sesame &amp; niger, (2008-09), Annual report, Sesame &amp; niger (2009-10), Annual report, Sesame &amp; niger (2010-11)

During 2010-11, in AVT second year, it observed 613 Kg grain per ha increasing 33.5 per cent higher than national check (Annual Report, 2010-11). This over all mean of three years showed grain yield 617 Kg/ha with increase of 30.5 per cent are national check.

Regarding oil yield, in IVT it recorded 203 Kg/ha, in AVT first year 206 Kg/ha with 28.7 per cent increase and in AVT second year 207 Kg/ha with 13.6 per cent increase are national check IGP-76 (Annual Report, 2008-09, 2009-10, 2010-11). Over all oil yield showed 208 Kg/ha with increase of mean 20 per cent over national check. JNS-28 recorded 55 days to 50% flowering, 98.7 days to physiological maturity, 120.5 cm plant height, 8.8 number of branch per plant, 47 capsules per plant, 4.49 g

weight per 1000 seed weight. It has green, narrow shaped leaves, yellow flower and purple pigmentation on stem.

It is resistant to cercospora and alternaria leaf spot in field condition. In phenotypic stability study done by Thakur *et al.* (2012) JNS-28 was found to be stable for number of productive branches per plant and number of productive capitula per plant. However, it exhibited below average stability, but was identified for higher seed yield in favorable environments.

It has been recommended to release all the state by the varietal identification committee during annual group meeting of AICRP on sesame and Niger held at ANGRAU, Hyderabad during April 2014 (Anonymous, 2014).

**Table 2 :** Summary of oil yield (kg/ha) of coordinated trials- *Kharif*2008-09 to 2010 -11 (AICRP trials).

Name of proposed variety: JNS 28

Adaptability Zone : All India Production condition: *Kharif* rainfed

Items	Year of testing	No. of trials/ locations	Proposed variety JNS-28	Check variety IGP – 76	Qualifying entries				
					PCN -08	JNS -30	JNS -10	DNS -4	BNC -15
Mean oil yield kg/ha	1 <sup>st</sup> year 2008-09 IVT	10	203	-	207	218	178	167	162
	2 <sup>nd</sup> year 2009-10 AVT	11	206	160	170	200	203	195	152
	3 <sup>rd</sup> year 2010-11 AVT	8	217	191	213	199	204	203	205
	Weighted mean	29	208.1	173.3	194.8	205.9	194.7	187.6	170.3
% increase/decrease over checks / qualifying entries	2008-09			-	-1.9	-6.9	+14.0	+21.6	+25.3
	2009-10			+28.7	+21.2	+3.0	+1.5	+5.6	+35.5
	2010-11			+13.6	+1.9	+2.0	+6.4	+6.9	+5.9
	Weighted mean	-	-	20.0	6.8	1.0	6.8	10.9	22.1
Frequency to top in group	2008-09	4	¼	0/4	2/4	2/4	0/4	0/4	0/4
	2009-10	5	1/5	0/5	1/5	3/5	0/5	0/5	1/4
	2010-11	8	0/8	0/8	2/8	1/8	0/8	3/8	1/8
	Total	17	2/17	0/17	5/17	6/17	0/17	3/17	2/17

Ref. Annual report, Sesame &amp; niger, (2008-09), Annual report, Sesame &amp; niger (2009-10), Annual report, Sesame &amp; niger (2010-11)

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