



Research Article

ALG 06 320 – A new high yielding Spanish bunch groundnut variety

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Abstract

The Central groundnut ALG 06 320 is the cross derivative of (J 11 x CG 52) x ICGV 86015. This variety yielded 2741 kg/ha and has given higher pod yield over the national check varieties; 33.06 % increase over TAG 24 (2060kg/ha); 29.05 % over R 8808 (2124 kg/ha); 2.16% over RHRG 06021 (2683 kg/ha); 7.15 % over ICGV 00351 (2558 kg/ha) during rabi season from 2008 to 2011 year. The variety ALG 06 320 is early in maturity (115 days) compared to R 8808 (116 days) and; RHRG (117 days). Shelling out turn (70.7%) is comparable with TAG 24(67.7), ICGV 00350 (66%), CTMG 6 (67%), RHRG 06021 (66%); R 8808 (67.7%). Sound mature Kernels are more in ALG 06 320 (90%) compared to TAG 24 (85.3%), R 8808 (84.3%), ICGV 00350 (86%); RHRG (82.7%) Oil content is also high (50.3%) in TAG 24 (49.3%) and R 8808 (49.7%). For the variety ALG 06 320 has shown lesser incidence of Peanut bud necrosis disease, Late leaf spot and rust diseases, compared to zonal check varieties. ALG 06 320 has shown tolerance against *Spodoptera litura*, leaf miner, leaf hopper and thrips. Thus, the groundnut culture ALG 06 320 was identified for release during 2013 by AICRP (G) and notified as Central groundnut ALG 06 320 during 2017 by CVRC.

Key words

Central groundnut, ALG 06 320, Spanish bunch, yield, Oil content

Introduction

Groundnut is one of the principal oilseed crops in the world. It is cultivated in 25.9 million ha in the world with a total production of 34.5 million tons and an average productivity of 1.33 t ha⁻¹. Developing countries, where groundnut is grown mostly under rainfed conditions, account for 96.9% of the world groundnut area and 93.8% of total production (FAOSTAT, 2002). Drought is the major abiotic stress factor affecting yield and quality of rainfed groundnut worldwide. Yield losses due to drought are highly variable in nature, depending on the timing, intensity and duration of the drought coupled with other specific environmental factors such as high levels of irradiance and high temperatures. In Tamil Nadu, 92% groundnut farmers are growing bunch type (Spanish bunch) during rainfed situation Kharif in larger area (2.36 lakh ha). The early stage drought occurs from July to August (Aadipattam) in a larger area. Similarly during rabirainfed situation from Oct-Nov (Karthigaipattam) in a lesser area (0.205 lakh ha)(Source: Season and crop report of Tamil Nadu 2013-14).In Tamil Nadu, groundnut is cultivated in 3.36 lakh ha. Year by year the area of groundnut is getting reduced due to failure of monsoon, non availability of labour, non availability of seed in time and available varieties being susceptible to pest and disease. Hence it is very much essential that a bunch groundnut variety

which is resistant / tolerant to disease and pest along with high yield is developed.

Materials and Methods

The groundnut ALG 06 320 was developed by hybridization followed by pedigree selection at ICRISAT during 1994. It is a hybrid derivative of (J 11 x CG 52) x ICGV 86015. From the segregating populations, bunch type was isolated and evaluated for its yield and yield contributing characters. The seeds were obtained from ICRSAT and evaluated at CRS, Aliyarnagar during 2005 and it was tested in comparative yield trial during 2006 and in Advanced evaluation trial during 2007-08, in AICRP (G) during rabi 2008-09 in IVT I and 2009-10 in IVT II and in Advanced yield trial during 2010-11 in AICRP centres. The entry was screened for diseases viz., late leaf spot, stem rot, PBNB and rust and thrips, spodoptera and leaf minor. The groundnut ALG06320 was identified as best and recommended by All Indian Coordinated Castor Improvement Workshop held at RRS, Mandor, Rajasthan during 17th May 2013 for central release. The committee observed that the variety, ALG 06 320 (Central Groundnut ALG 06 320), is superior over all the three check varieties in terms of pod, kernel and oil yield at all the stages of its testing in addition to resistance to major diseases and high shelling turn over, more mature kernels

and test weight. In the 12th plan, due to shifting of junior breeder post of AICRP (G) from CRS, Aliyarnagar to ORS, Tindivanam from 1.4.2015 and the basic seeds of variety ALG 06 320 handed over to Tindivanam during 2015 without submitting gazette notification proposal. The Tindivanam centre took initiative to get notification by providing enough necessary documents as mentioned in the notification format, getting the data for DNA finger printing and the notification proposal was prepared and submitted to CVRC to be released as Central groundnut ALG 06 320. The groundnut ALG 06320 is proposed for testing at AICRP (G) from Aliyarnagar during 2008-09 as ALG 06320. Hence the name of the groundnut was given as Central groundnut ALG 06320 for release.

Results and Discussion

Groundnut culture ALG 06 320 that was tested from 2005 to 2011 recorded mean pod yield of 2741 kg /ha through various trials. This is an increased yield of 33.06, 29.05 and 7.15 per cent over TAG 24 (National Check), R 8808 (Zonal check) and ICGV 00350 respectively (Zonal check) (Table 1).

Groundnut culture ALG 06320 recorded 3452 kg of pods/ha in the IVT I 2008-09 trials. This is an increased yield of 59.3 and 30.2 per cent over TAG 24 and R 8808. This culture has recorded 2353 kg of pods/hain IVT II 2009-10 trial. It represents an increased yield of 11.3 and 15.6 percent increased yield over TAG 24 and R 8808.

The groundnut culture ALG 06 320 recorded 2741 kg/ha of dry pod yield in Advanced yield trial 2010-11. The increased pod yield is higher by 30.4, 35.5 and 0.8 per cent over TAG 24, R 8808 and ICGV 00350 respectively. The variety ALG 06 320

recorded a much lower incidence (2.33%) than that of national check, TAG 24 (3.34 %) for rust disease and Zonal check R 8808 (5.50 %). Similarly, for Late Leaf Spot Disease, the proposed variety recorded a lower incidence (3.54%) than that of national check; TAG 24 (5.16%) (Table 3)

For thrips, the vector of PBNB, the proposed variety, ALG-06-320, has shown a lower incidence (11.77%) than that shown by qualifying check CTMG 6 (11.80%). Similarly, for leaf miner, the proposed variety has shown tolerant reaction (1.20% leaf damage) while the check variety has shown 1.85 % incidence (Table 4).

The variety has responded even at the recommended doses of fertilizers than at lower doses. The variety ALG-06-320 gave 2126 kg/ha pod yield at 100% recommended dose of fertilizer compared to 2057 kg /ha at 75 % recommended dose of fertilizer. Planting geometry also influenced the pod yield of the proposed variety. There was an enhancement of pod yield (2191 kg/ha) by 11% when the variety ALG 06 320 was sown at normal (30 x 10 cm) spacing as compared to the yield when sown at a wider spacing of spacing of 30 cm x 15 cm (1968 kg/ha). Thus the variety is much suited to sowing under normal spacing 30 x 10 cm (Table 5).

With all the above mentioned special features of the newly developed culture ALG 06320, it was released by ICAR and DGR as a new variety Central groundnut ALG 06320 for general cultivation for groundnut growing areas of Tamil Nadu and Andhra Pradesh during 2017.

References

- FAO statistics, 2002
- Season and crop report of Tamil Nadu 2013-14

Table 1. Summary of pod yield (kg/ha) data of AICRP (G) coordinated trials

Characters	Year of testing	No. of trials	Proposed variety	Check varieties			CD (5%)
			ALG-06-320	TAG 24 (NC)	R 8808 (ZC)	ICGV-00350 (ZC)	
Mean kg/ha	IVT-I 2008-09	6	3452	2167	2652	-	596.9
	IVT-II 2009-10	6	2353	2115	2036	-	534.5
	AVT 2010-11	7	2579	1979	1904	2558	444.6
	Pooled (IVT & AVT) 3 Years	19	2741	2060	2124	2558	
	Weighted Mean	19	2741	2060	2124	2558	
Percent increase / decrease over checks and qualifying varieties	IVT-I 2008-09	6	-	59.3	30.2	-	
	IVT-II 2009-10	6	-	11.3	15.6	-	
	Pooled IVT	12	-	35.5	23.8	-	
	AVT 2010-11	7	-	30.3	35.5	0.8	
	Weighted Mean	19	-	33.06	29.05	7.15	
Frequency in the top group (pooled for 3-4 years)			4/19	1/19	0/19	1/7	

IVT – I, initial varietal trial stage I; IVT – II, initial varietal trial stage II; AVT, advanced varietal trial stage

Table 2. Description of variety central groundnut ALG-06-320

A Distinguishing morphological characters		
I. Growth habit	:	Erect (Spanish bunch)
II. Branching pattern	:	Sequential
B Leaf characters		
I. Leaf shape	:	Oblong elliptic
II. Leaf size	:	Medium
III. Foliage colour	:	Green
C Flower characters		
I. Flowering pattern on side branches	:	Sequential
II. Flowering on main stem	:	Present
D Pod characters		
I. Pod beak	:	Absent
II. Pod size	:	Small
III. Number of kernel per pod	:	1-2
IV. Constriction	:	Slight
V. Reticulation	:	Slight
VI. Shelling out turn (%)	:	70 %
E Kernel characters		
I. Kernel size	:	Small
II. Testa colour	:	Light tan
III. 100 kernel wt (g)	:	35 g
IV. Oil content (%)	:	50 %
V. Sound Mature Kernel (%)	:	88 %
F Plant height (cm)		35 to 40 cm
G Maturity (in number of days)	:	115 days



Table 3. Reaction to major diseases

Disease	Year of testing	No. of trials	Proposed Variety	TAG 24(NC)	R 8808(ZC)	ICGV-00350(ZC)
ALG-06-320						
Rust (% of damaged plants)	2008-09	4	2.50	3.525		
	2009-10	3	2.50	4.51	4.00	
	2010-11	3	2.67	5.00	7.00	4.33
	Mean	10	2.33	3.34	5.50	4.33
Late leaf spot (1 to 9 scale)	2008-09	4	3.63	4.48		
	2009-10	3	3.00	4.00	3.50	
	2010-11	3	4.00	7.00	4.00	5.00
	Mean	10	3.54	5.16	2.50	1.67
Stem rot (% of damaged plants)	2008-09	4	28.19	18.79		
	2009-10	3	22.05	14.33	5.70	
	2010-11	3	11.98	26.35	30.80	17.52
	Mean	10	20.74	19.82	12.17	5.84
PBNB (% of damaged plants)	2008-09	5	3.218	4.536	2.78	2.38
	2009-10	4	4.4336	7.0732	2.826667	8.335
	2010-11	4	0	1.5	5.7	0
	Mean	13	2.55	4.37	3.77	3.57

Table 4. Reaction to major pests

Disease	Year of testing	No. of trials	Proposed Variety	TAG 24(NC)	R 8808(ZC)	ICGV-00350(ZC)
ALG-06-320						
Thrips	2008-09	6	8.64	11.30		7.08
(damage %)	2009-10	5	11.32	10.00		2.50
	2010-11	6	17.81	12.55		14.34
	W. Mean	17	12.6	11.3		8.0
Leaf hopper	2010-11	3	8.50	7.31		7.71
(damage %)						
<i>Spodopteralitura</i>	2008-09	2	8.26	2.02		
(damage %)	2009-10	2	4.085	4.02		
	2010-11	4	12.0	11.8	0.0	11.7
	W. Mean	7	8.12	5.95	0.00	11.70
Jassids	2008-09	1	1.7	2.4	-	-
(damage %)	2009-10	1	1.6	1.8	-	-
	2010-11	2	1.7	2.2		1.9
	W. Mean	4	1.67	2.13		1.90
Heliothis	2009-10	1	35	19	0	-
(damage %)	2010-11	1	16.5	18.8		15.9
	W. Mean	2	25.75	18.9	0	15.9
Leaf minor	2008-09	1	0.6	0.4	-	-
(damage %)	2009-10	1	0	0.09	-	-
	2010-11	1	2.99	2.15	-	1.85
	W. Mean	3	1.20	0.88		1.85
Green leaf minor	2010-11	2	8.7	7.7	2.9	8.6
(damage %)						
Defoliator damage	2008-09	1	3.2	2.1	-	-
	2009-10	1	1.44	0.51	-	-
	2010-11	1	5.06	0.41	-	4.6
	Mean	3	3.23	1.01		4.60



Table 5. Adaptability to Agronomic Variables

Nature of Expt.		Item	Proposed variety	Check varieties	
			ALG-06-320	VRI(Gn)6	TMV(Gn)13
Pod yield (kg/ha) under different levels of Recommended Dose of Fertilizer					
Fertilizer experiments	Yield (kg/ha)	Recommended dose 100 % RDF (17:34:54 kg N: P ₂ O ₅ : K ₂ O) /ha	2126	2143	1737
		75 % RDF(17:34:54 kg N: P ₂ O ₅ : K ₂ O) /ha	2057	2146	1580
		50 % RDF (17:34:54 kg N: P ₂ O ₅ : K ₂ O) /ha	2056	2176	1756
	Percentage gain/loss under other doses	% Increase in 75 % RDF over 100 % RDF	-3.2	0.1	-9.0
		% Increase in 50 % RDF over 100 % RDF	-3.3	1.5	1.1
		% Increase in 50 % RDF over 75 % RDF	-0.05	1.4	11.1
Pod yield (kg/ha) under different planting geometry					
Planting Geometry	Percent gain/loss with	S1 (30cm x 10cm)	2191	2123	1723
		S2 (30cm x 15cm)	1968	2186	1659
		% Increase in S1 over S2	11.3	-2.9	3.9

Note: Recommended Dose of Fertilizers (N 17 kg/ha; P₂O₅ 34 kg/ha and K₂O 54 kg/ha)