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COGn 4: A bold seeded high oil yielding bunch groundnut

V. MURALIDHARAN, N. MANIVANNAN, B. SUBBALAKSHMI, C. SURENDRAN, C.S. SRIDHARAN, T.K. RAMACHANDRAN, R. KANNAN AND G. UMAPATHY
Department of Oilseeds, Tamil Nadu Agrl. University, Coimbatore- 641 003, Tamil Nadu.

Abstract : Groundnut variety COGn 4, a hybrid derivative of TMV 10 x ICGS 82 was released during January 2001 for Tamil Nadu. It has desirable attributes *viz.* high pod yield, high oil content, bold kernel with less incidence of bud necrosis. It matures in 110 days and gives an average yield of 1500 and 1950 kg ha^{-1} under rainfed and irrigated conditions respectively. This variety is suitable for both rainfed and irrigated conditions and can be grown during *kharif, rabi* and summer seasons.

Keywords: Groundnut, Spanish bunch, Bold seeded, High oil content.

Introduction

Groundnut (*Arachis hypogaea* L.) is one of the important oilseeds crop in Tamil Nadu and grown in an area of 10.8 lakh ha annually. The annual production is 17.6 lakh tonnes with a productivity of 1630 kg ha^{-1}. Though many high yielding varieties have been released for general cultivation, there was a long felt need for a bold seeded spanish bunch variety coupled with high yield and high oil content. Hence, research work was initiated at Department of oilseeds, Tamil Nadu Agricultural University, Coimbatore to develop a bold seeded spanish bunch variety with high yield and high oil content.

Materials and Methods

The spanish bunch groundnut culture TNAU 269 was a derivative of the TMV10xICGS 82

Table 1. Over all performance of groundnut culture TNAU 269 in various trials for pod yield (kg ha^{-1})

Name of the trial / Location	No.of locations	TNAU 269	CO 3	VRI 2	Per cent increase over	
					CO 3	VRI 2
i) Kharif						
Station trials	5	1355	1263	1131	7.3	19.8
MLT	13	1429	-	1349	-	5.9
ART	34	1741	1498	1557	16.2	18.8
Mean (kg ha^{-1}) dry pod yield	(52)	1508	1381	1346	9.2	12.0
Mean oil yield (kg ha^{-1})	-	795	702	690	13.2	15.2
ii) Rabi/Summer						
Station trials	6	1454	1299	1083	11.9	34.3
MLT	5	2203	-	1960	-	12.4
ART	30	2118	2032	1914	4.2	10.7
AICRP trials*	12	2670	-	2237 (JL 24)	-	19.4 (JL 24)
Mean (kg ha^{-1}) dry pod yield	(41)	1925	1666	1652	15.5	16.5
Mean oil yield (kg ha^{-1})	-	1014	846	847	19.9	19.7

* not considered for arriving mean

Table 2. Performance of groundnut culture TNAU 269 in adaptive research trials (pod yield kg ha^{-1})

District	No. of locations	TNAU 269	CO 3	VRI 2
Kharif 1998				
Virudhunagar	2	1303	1312	1264
Cuddalore	1	1625	1750	1500
Salem	2	1944	1970	1791
Erode	2	2750	2619	2875
Vellore	2	850	763	688
Coimbatore	2	1455	1090	981
Dharmapuri	2	904	1113	738
Mean	(13)	1541	1498	1398
Kharif 1999				
Trichy	2	2219	-	1867
Theni	2	1333	-	1356
Thiruvallur	1	2468	-	1925
Pudukkottai	2		-	1481
Salem	2	1125	-	1158
Cuddalore	2	2610	-	2440
Tuticorin	2	2130	-	1969
Kancheepuram	2		-	1040
Dharmapuri	2	2616	-	2007
Karur	2	2463	-	2138
Thiruvannamalai	2	1780	-	1588
Mean	(21)	1941	-	1715
Over all mean (*Kharif*)	(34)	1741	1498	1557
Rabi/Summer 1998-99				
Virudhunagar	2	1912	1854	1953
Cuddalore	2	1200	1213	1225
Madurai	2	2783	2960	2040
Tirunelveli	2	2038	2100	2050
Mean	(8)	1983	2032	1817
Rabi/ Summer 1999-2000				
Cuddalore	2	2869	-	2606
Erode	2	3157	-	2188
Coimbatore	2	1777	-	1742
Namakkal	2	2908	-	2725
Perambalur	2	1618	-	1530
Pudukkottai	2	1463	-	1325
Dharmapuri	2	1509	-	1299
Karur	2	3560	-	3473
Thiruvannamalai	2	1750	-	1669
Vellore	2	1938	-	1963
Tirunelveli	2	2238	-	1596
Mean	(22)	2253	-	2010
Over all mean (*Rabi/summer*)	(30)	2118	2032	1914

Table 3. Morphological description of groundnut variety COGn 4 (TNAU 269)

Pedigree	TMV 10 x ICGS 82
Duration	105-110 days
Maturity group	Medium
Botanical group	Spanish bunch
Plant height (cm)	25 - 45
Primary branches	4 - 5
Secondary branches	Available
Leaves	Large leaves and dark green
Pods	Usually two seeded, bold, less prominent beak, less constriction, moderate reticulation
Kernel colour	Rose
100 pod weight (g)	140.9
Shelling outturn (%)	69.3
100 seed weight (g)	53
Oil content (%)	53.5

Table 4. Performance of groundnut culture TNAU 269 for diseases and insect pests at Coimbatore during *kharif* 2000

Diseases / Insects	TNAU 269	CO 3	VRI 2
Diseases:			
Late leaf spot (1-9 scale)	3.0	4.8	5.8
Rust (1-9 scale)	3.0	4.8	5.4
Bud necrosis (%)	1.0	3.8	10.7
Insect pests:			
Leaf miner (%)	3	3	3
Heliothis (%)	3	3	3

developed by adopting pedigree breeding. The crossing programme was initiated during 1992 at Department of Oilseeds, Tamil Nadu Agricultural University, Coimbatore. The segregating progenies were evaluated during 1992-94. The homozygous culture TNAU 269 was evaluated in station trials with checks CO 3 and VRI 2 since 1995. Based on its superior performance the culture was promoted to multilocation trials and evaluated in various research stations of the university with VRI 2 as check during 1997 and 1998. Based on the superior performance, it was nominated for adaptive research trials during *kharif* 1999 with CO 3 and VRI 2 as check and during *rabi* / summer 1999 - 2000 with VRI 2 as check. Simultaneously, it was evaluated in All India Coordinated trials during *rabi*/summer 1997-98 and 1998-99 in initial varietal trials and promoted to advanced varietal trials in zone III b which comprises of research centers of Tamil Nadu and Kerala. Field screening was also carried out for its reaction to insect pest and diseases.

Results and Discussion

The over all performance of TNAU 269 for dry pod yield in various trials are presented in Table 1. In the station trials, TNAU 269 recorded 1355 and 1454 kg ha^{-1} during *kharif* and *rabi* seasons respectively as compared to 1263 and 1299 kg ha^{-1} by CO 3 and 1131 and 1083 kg ha^{-1} by VRI 2. In multilocation trials, TNAU 269 recorded 1429 and 2203 kg ha^{-1} dry pod yield during *kharif* and *rabi* seasons respectively registering an increase of 5.9 and 12.4 per cent over VRI 2. The adaptive research trials conducted at farmer holdings revealed that TNAU 269 recorded 1741 and 2118 kg ha^{-1} dry pod yield and out yielded CO 3 by 16.2 and 4.2 per cent and VRI 2 by 18.8 and 10.7 during *kharif* and *rabi* seasons respectively (Table 2). In AICRP trials conducted during *rabi* seasons, TNAU 269 recorded 2670 kg ha^{-1} dry pod yield as compared to 2237 kg ha^{-1} by JL 24, the national check. The over all performance of TNAU 269 was 1508 and 1925 kg ha^{-1} during *kharif* and *rabi* seasons respectively as against 1381 and 1666 kg ha^{-1} by CO 3 and 1346 and 1652 kg ha^{-1} by VRI 2. Considering the oil yield, the culture TNAU 269 recorded 795 and 1014 kg ha^{-1} during *kharif* and *rabi* seasons respectively while the checks CO 3 recorded 702 and 846 kg ha^{-1} and VRI 2 recorded 690 and 847 kg ha^{-1}. It is 13.2 and 19.9 per cent over CO 3 and 15.2 and 19.7 per cent over VRI 2 during *kharif* and *rabi* seasons respectively.

The morphological and quality characters of TNAU 269 are presented in Table 3. The culture recorded 100 pod weight of 141 g, 100-kernel weight of 53.1 g, shelling outturn of 69.3 per cent, the oil content of 53.5 per cent. The reaction against insect pest and diseases for TNAU 269 and check varieties CO 3 and VRI 2 are presented in Table 4. The culture TNAU 269 recorded grade 3.0 for both late leaf spot and rust as compared to 4.8 and 4.8 by CO 3 and 5.8 and 5.4 by VRI 2 in 1-9 scale where 1 (highly resistant) and 9 (highly susceptible). Similarly for bud necrosis TNAU 269 recorded 1 per cent infestation as against 3.8 per cent by CO 3 and 10.7 per cent by VRI 2. With regard to leaf minor and *Heliothis* incidence, TNAU 269 and check varieties CO 3 and VRI 2 recorded moderate and equal incidence. Hence, based on these merits of TNAU 269, it was released as COGn 4 during January, 2001 by State Variety Release Committee for general cultivation in Tamil Nadu.

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