

Performance of Groundnut Varieties in Kallakurichi district Through Farmer Participatory Mode

Abstract

Field demonstrations were conducted in farmers' field of Kallakurichi district during rabi 2020-21 to assess the growth, yield performance and economics of new groundnut varieties under irrigated condition. Three improved groundnut varieties viz. TMV14, Dharani (TCGS-1043) and CO 7, and check variety TMV 7 was taken for study. Critical inputs such as Groundnut seed (40 kg farmer⁻¹), seed treatment chemicals, groundnut rich @ 5 kg ha⁻¹ and bio inputs were distributed to identified farmers (50 nos) by Krishi Vigyan Kendra, Kallakurichi through ICAR Cluster Front line Demonstration (CFLD) programme. The study revealed that Dharani variety recorded higher number of pods (36/plant), pod yield (2530 kg/ ha), Haulm yield (3890 kg/ ha), higher gross returns of Rs 139150 ha⁻¹ and net return of Rs 84900 ha⁻¹ with higher benefit ratio of 3.0 followed by CO7 variety with pod yield of 2380kg/ ha and B:C ratio of 2.84 when compared to TMV 7 and local check. The impact of FLD was also analyzed which showed that there was significant improvement in adoption of new variety, improved technologies, knowledge level and satisfaction on the part of farmers. It concluded that, groundnut varieties Dharani and CO 7 are suitable for cultivation in *rabi/summer* (January-April) season of Kallakurichi district.

Key words

Groundnut varieties, Cluster Front line Demonstration (CFLD), Pod yield and Economics

Introduction

Groundnut is the important leguminous cum oilseed crop that is widely cultivated in tropics and sub tropics region of the world. It contains 48-51% of oil and 26-28% of protein, and is a rich source of dietary fiber, minerals and vitamins. Hence, groundnut played an important role in nutritional security to the resource poor farmers. In addition, the haulms provided excellent fodder for livestock, cake obtained after oil extraction was used in animal

Comment [K1]: Abstract:

-The abstract must be devoid of unstandardized abbreviations like TMV, CO7, FLD and ICAR. They must be written in full. Abbreviations in subsequent sections could be used.

-Methodology or approach used in generating the study's results must be summarized in a sentence and integrated in the abstract after the main aim of the study.

34 feed and overall the crop acted as good source of biological nitrogen fixation (Nautiyalet
35 al,2011). Globally, the crop is raised in 29.5 million hectares with a total production of 48.7
36 million MT. The average productivity is 1647 kg/ha (FAOSTAT,2019)

37 Globally, India ranks first in Groundnut acreage and is the second largest producer in
38 the world with 101 lakh tonnes with a productivity of 1816 kg/ha in 2020-21
39 (agricoop.nic.in).Gujarat, Rajasthan,Tamil Nadu and Andhra Pradesh are the leading
40 producers in the country and accounts for nearly 75% of the total output. Tamil Nadu is one
41 of the leading groundnut producing state with an area, production and yield of 3.35 lakh
42 hectares, 9.11 lakh tons and 2718 kg/hectare, respectively. Groundnut crop is cultivated in all
43 season, but nearly 80 percent acreage and production comes from *kharif* season (June-
44 October).

45 Groundnut acreage in the country is fluctuating over the years and from the last two
46 decades the area had declined from 83 lakh ha to 47 lakh ha as farmers are shifting from
47 Groundnut to other remunerative crops.Though the groundnut productivity of the state is still
48 the highest among the different groundnut growing states in the country, the groundnut yield
49 realized over the years showed fluctuations because of frequent changes in the rainfall pattern
50 and also owing to long spell of drought experienced during the crop growth period.Low and
51 unstable yields of most oilseed crops, and uncertainty in returns to investment, which result
52 from the continuing cultivation of oilseeds in rainfed, high risk production environments, are
53 the factors leading to this situation of wide demand-supply gap in India.

54
55 InKallakurichi district, Groundnut is grown in 12700 ha with a total production of
56 only 19304 tonnes, and a very poor yield of 1520 kg/ha. The main reasons of such a very
57 poor yield per ha in Kallakurichi district is due to cultivation of low yielding varieties,
58 poor and marginal land, non-adoption of improved farming techniques, and an overall lack
59 of awareness among farmers about improved packages of practices.To overcome the above
60 saidproblems Krishi Vigyan Kendra, Kallakirichi(Villupuram –II) has laidout cluster front line
61 demonstration (CFLD) programme in farmers field of Kallakirichi districtto assess the yield
62 performance of improved Groundnut varieties through farmer participatory mode.

63 64 **Materials and methods** 65

Comment [K2]: Introduction:

-Research progress regarding what is known about the topic or scope of this study and unknown, but important to be studied has not been captured in the introduction.
-Authors can integrate some global underlying theories, sustainable development goals and economic or livelihood framework parameters linked to the key subject of this study or agriculture to enrich the introductory aspect.
-What is the contribution of this study to existing knowledge? It must be made clear or integrated in the last paragraph.

Comment [K3]: Materials and methods

-Any justification for the methods used in collecting and analysis data collected? Which existing studies used the said approach and how standard are they in validating findings.

66 Field demonstrations cum trails were conducted in farmers field during rabi 2020-
 67 21, to assess the yield performance and economics of new groundnut varieties under irrigated
 68 condition with integrated crop management practices. The trial plot size was 0.2 ha area with
 69 plant spacing of 30x10 cm followed. Three improved groundnut varieties such as TMV14,
 70 Dharani (TCGS-1043), CO 7 and check variety TMV 7 was taken for study (Table 1). The soil
 71 was sandy clay loam in texture with pH 7.2. The fertility status of the soil was low, medium
 72 and medium in the available N, P₂O₅, and K₂O, the values is 210, 13 and 140 kg ha⁻¹
 73 respectively. Critical inputs such as Groundnut seed (40 kg farmer⁻¹), seed treatment
 74 chemicals (Trichoderma viride), TNAU groundnut rich at @ 5 kg ha⁻¹ and bio inputs were
 75 distributed to identified farmers (50 nos) by Krishi Vigyan Kendra, Kallakurichi through
 76 ICAR Cluster Front line Demonstration (CFLD) programme. Demonstration was laid out in
 77 farmers field of Nainarpalayam and Kalasamuthiram cluster villages through farmer
 78 participatory mode. Training and method demonstration were carried out in farmers field for
 79 enriching Groundnut production technologies and effective implementation of
 80 demonstrations.

Comment [K4]: -In what mode were farmers engaged?

-How many farmers were engaged? How representative is the said number?

81 **Table 1. Characteristics of varieties selected for demonstration**

Name of the variety	Source	Duration (Days)	Special features
TMV14	TNAU, 2018	95 -100	Erect and bunchy plant, 70% shelling, 48 % oil content
Dharani (TCGS-1043)	ANGARU, 2013	100-110	Suitable for all season, drought tolerant, shelling outturn 75%, oil content 50%
CO 7	TNAU, 2013	100-105	Tolerant to drought, Moderately resistant to rust and late leaf spot, shelling outturn 71%, oil content 51%

83
 84 The recommended package of practices for groundnut cultivation followed as per
 85 TNAU, at CPG, 2020. Major weeds found in demonstration fields were *Chloris barbata*,
 86 *Cyperus rotundus* and *Amaranthus viridis* and weed managed by hand weeding at 20 and 45
 87 DAS. Check basin method of irrigation followed in all farmers field. An average of 32
 88 mandays was engaged per house hold as employment (Table 2).

89 **Table 2. Agronomic practices and employment generation realised in demonstration**

Major weeds found in demo field	Method of weed management	Method & No. of irrigation	Major insect and disease observed	Method of harvesting	Employment generation (man days/house hold)
<i>Chloris barbata</i> ,	Hand weeding at @ 20 & 45	Check basin	Jassids and stem rot	Manual	32 nos

<i>Cyperus rotundus</i> <i>Amaranthus viridis</i>	DAS	method & 7 nos			
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90
91 The data on germination (in percentage), Pplant height at harvesting stage, number
92 No. of pods/ plant, pod yield, haulm yield and economics of all the varieties were recorded.
93 Farmers feedback were also collected to ascertain know the field and market performance of
94 new Groundnut varieties.

95
96 **Results and Discussion**

97 The results of the study revealed that,Dharani (TCGS-1043)variety recorded more
98 germination percent and plant height of 37.5 cm at harvesting stage when compared to other
99 varieties. Higher plant height may be attributed to the variety which tends to germinate and
100 establish early compared to farmer practice varieties with medium and small seeds. Similar
101 increase in plant height with large seeds was also observed by Singh *et al.*, (1998) and
102 Nandania *et al.*, (1992).

103 Among the three varieties evaluated for their performance under demonstration
104 Dharani registered the highest mean pod number of 36 and dry pod yield of 2530
105 kg/ha followed by CO7with pod number of 32 and dry pod yield of 2380 kg/ha. The
106 improved variety Dharani produced 13 and 24 percent higher yield when compared to TMV
107 14 and farmers practice variety, respectively (Table 3). Groundnut varieties, CO 7 and TMV
108 14 recorded 17 and 10 per cent higher pod yield than check variety (TMV 7), respectively.
109 With regard to haulm yield, dharani variety recorded highest haulm yield of 3890 kg/ha as
110 compared to other varieties. The probable reason for higher yield due to genotype character
111 and lesser incidence of pest and disease coupled with higher number of pods/plant resulting
112 higher pod and haulm yield these results were in agreement with the findings of
113 Vindhivaraman *et al.*, (2010) and Saravanan *et al.*, (2018).

114 **Table 3. Yield and economics of Groundnut varieties during rabi 2020-21 under**
115 **demonstration**

Varieties	TMV 14	Dharani	CO 7	Farmers practice (TMV 7)
Germination %	84	91	87	78
Plant height at	31.6	37.5	36	34

Comment [K5]: Results and discussion:
-Authors need to adequately discuss/digest/explain the results obtained by considering some external factors, policies, plans and programs that influenced the results of this study.
-Again, implications going forward on several sectors, along with uncertainties could be chipped in to make the discussion section extensive. There is the need to refer or compare current findings with more literature on dynamisms linked to the scope of this study.
-Tables 1-4 were not thoroughly discussed pertaining to the results presented and the linkages between them.
-Authors could add recommendations based on results generated for this study.

harvesting stage (cm)				
No.of pods/plant	28	36	32	25
Pod yield (kg/ha)	2240	2530	2380	2035
Haulm yield (kg/ha)	3360	3890	3570	3060
Gross return (Rs/ha)	123200	139150	130900	111925
Net return (Rs/ha)	78200	93150	84900	66950
B: C ratio	2.67	3.0	2.84	2.48

116

117 Economic analysis of the yield performance revealed that improved Dharani variety
 118 recorded higher gross returns of Rs 139150 ha⁻¹ and net return of Rs 93150 ha⁻¹ with higher
 119 benefit ratio of 3.0 as compared to other varieties and local checks. Groundnut variety CO7
 120 observed net return of Rs 84900 ha⁻¹ with benefit ratio of 2.84. Farmers perception and
 121 feedback about the variety was higher yield, attractive pods, higher market price, suitability to
 122 existing farming situation, more affordability and farmers are satisfied about this variety
 123 (Table 4).

124 **Table 4. Farmer's Perception Parameters of Groundnut varieties**

Farmer's Perception Parameters (scientists observation)						
Variety	Suitability to the existing farming system (Y/N)	Likings (Varietal ranking)	Affordability (%)	Any Negative Effect (Y/N)	Level of Technology Acceptance (%)	Suggestions, for Change/Improvement, If any
TMV 14	Yes	III Rank	72	No	76	Small size pod and kernal
Dharani	Yes	I Rank	80	No	85	Nil
CO 7	Yes	II Rank	75	No	80	Nil

125

126 **Conclusion**

127 It concluded that, groundnut varieties Dharani and CO 7 are suitable for cultivation in
 128 *rabi/summer* (January-April) season of Kallakurichi district. The impact of FLD was also
 129 analyzed which showed that there was significant improvement in adoption of new varieties,
 130 improved technologies, knowledge level and satisfaction on the part of farmers. Hence, this
 131 new varieties Dharani and CO 7 are recommended for large scale cultivation in Kallakurichi
 132 district.-

133 **References**

134 www.agricoop.nic.in,2020-21

Comment [K6]: Conclusion:

-The conclusion is too brief. Authors should integrate the significance of the study to policy-makers, international scientific community/researchers, industrial players and so on.
 -What were the challenges encountered when conducting this study? Any study limitations that could propel or drive future studies? These parameters must be included in the concluding section.

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Comment [K7]: References:

-Authors need to reference this appropriately. It must be referenced as:

i. Name of author(s)/organisation, year of publication, title of the project or article or report, institution involved/publisher, country followed by a link to the site the piece was retrieved from or published for link/web-based references.