On-farm evaluation of high yielding groundnut varieties for wider adoption in Erode district, Tamil Nadu

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ABSTRACT

Groundnut (*Arachis hypogaea* L) is an important oilseed crop cultivated in Erode district over an area of about 25,000 ha. Attempts were made in the year 2014 to identify the suitable high yielding groundnut varieties for this region. The experiment was laid out in a randomized complete block design with five treatments and four replications. Five selected groundnut varieties (VRI-2, CO-2, TMV-7, TMV-13 and ICGV-91114) were used for the evaluation. The study revealed that the variety ICGV-91114 recorded the significantly higher pod yield of 2,054.5 kg/ha followed by TMV-13 with 1,924.5 kg/ha. The least yield of 1,608.2 kg/ha was recorded in case of CO-2 variety. It was concluded that ICGV-91114 could be recommended to cultivate in Erode district of Tamil Nadu for improving the production of groundnut.

Keywords: Groundnut; varieties; yield; evaluation

INTRODUCTION

Groundnut is an important oil and protein source to a larger portion of population in Asia, Africa and America. Groundnut is grown in the semi-arid zones under fairly low input situation and even under such situation the average yield is around 800 to 1,000 kg/ha. It is predominantly used for oil extraction in many Asian and African countries. After extraction of oil, the oil cake is used as good manure and cattle feed (Upadhyaya et al 2006).

The leaf portion of groundnut called haulm can be given to the cattle as green folder. Similarly the haulm can also be incorporated in the soil that serves as good organic manure after decomposition. Roasted groundnut kernels are very delicious table dish and rich in protein. Groundnut kernel powder is an important cooking material to prepare various delicious sweets and savouries.

Groundnut seed contains about 45 per cent oil and 26 per cent protein. It is rich source of thiamin, riboflavin, nicotinic acid and vitamin E. It also contains phosphorus, calcium and iron. The oilcake contains 7 to 8 per cent nitrogen, 1.5 per cent phosphorus and 1.5 per cent potash. The crop builds up soil fertility through nitrogen fixation and is an efficient cover crop especially for lands exposed to soil erosion. Groundnut was grown on about 27.9 Mha across 100 countries for a global production of 47 MT during 2017 (http://www.fao.org/faostat/en/#home). India occupies the first place in area and second position in production of groundnut. The cultivation of groundnut is mostly found in southern states like Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu and Maharashtra. It is also grown in Madhya Pradesh, Rajasthan, Uttar Pradesh and Punjab.

Unaware of new varieties and non-availability of seeds force the farmers to recycle their own seed which further complicates the situation. This has raised the concerns to the breeders as well as farmers on the breeding for better groundnut varieties and their subsequent introduction in the country. On-farm trials have been found to be effective in the evaluation and selection of new varieties and technologies (Adjei-Nsiah et al 2007) for the location specificity. Keeping this view in mind ICAR- Krishi Vigyan Kendra, Myrada, Tamil Nadu conducted the trial on performance

evaluation of high yielding groundnut varieties for improving the productivity.

MATERIAL and METHODS

On-farm field trials were conducted in 2014 in Erode district of Tamil Nadu to evaluate the high yielding groundnut varieties suitable for this region. The field experiment was laid out in randomized block design with 5 treatments and 4 replications. The treatments comprised 5 varieties viz VRI-2, CO-2, TMV-7, TMV-13 and ICGV-91114; the first four varieties released by Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu and the last variety released by ICRISAT, Hyderabad, Telangana the details of which are given in Table 1. The plot size for each treatment was 80 m^2. The soil type of the trial plot was red sandy and the recommended package of practices was adopted as suggested by Tamil Nadu Agricultural University, Coimbatore. The harvested groundnut pods obtained from each net plot (8 x 5 m) were dried to a moisture content of 13 per cent, weighed and extrapolated to total pod yield per hectare and converted into one hectare area. Statistical data were analyzed by using ANOVA.

Table 1. Details of the varieties evaluated

Variety	Special features
VRI-2 (farmers' practice)	Duration: 100-105 days, average yield: 2,060 kg/ha, 100-seed weight: 49 g, released by: TNAU, Coimbatore
CO-2	Duration: 100-105 days, average yield: 2,200 kg/ha, 100-seed weight: 41 g, released by: TNAU, Coimbatore
TMV-7	Duration: 100-105 days, average yield: 1,900 kg/ha, 100-seed weight: 36 g, released by: TNAU, Coimbatore
TMV-13	Duration: 100-105 days, average yield: 2,580 kg/ha, 100-seed weight: 44 g, released by: TNAU, Coimbatore
ICGV-91114	Duration: 95 days, average yield: 2,870 kg/ha, 100-seed weight: 41 g, released by: TNAU, Coimbatore

RESULTS and DISCUSSION

The data collected from the trial plots are presented in Table 2. From the data it is evident that adoption of scientific package of practices along with the variety ICGV-91114 recorded the average yield of 2,054.5 kg/ha which was significantly superior over all other treatments. This was followed by TMV-13 and TMV-7 with pod yield of 1,924.5 and 1,812.0 kg/ha respectively. The variety CO-2 was at par with VRI-2 (farmers' practice) in yield with pod production of 1,608.2 and 1,617.4 kg/harespectively. The findings of the present study are in line with those of Swaroopa et al (2016) and Hiremath and Nagaraju (2009).

Table 3 indicates the per cent increase in yield of various varieties over the farmers' practice variety. The highest increase in yield of 27.02 per cent was recorded in case of ICGV-91114 followed by 18.98

Table 2. Pod yield of different groundnut varieties tested

Variety	Pod yield (kg/ha)
VRI-2	1,617.4
CO-2	1,608.2
TMV-7	1,812.0
TMV-13	1,924.5
ICGV-91114	2,054.5
SEd±	15.33
$CD_{0.05}$	32.49

Table 3. Increase in yield over farmers' practice

Variety	Pod yield (kg/ha)	Increase in yield over farmers' practice (%)
VRI-2	1,617.4	-
CO-2	1,608.2	-0.56
TMV-7	1,812.0	12.03
TMV-13	1,924.5	18.98
ICGV-91114	2,054.5	27.02

per cent increase in TMV-13 and 12.03 per cent increase in TMV-7. The results are in line with the findings of Devi et al (2018).

CONCLUSION

Based on the findings it is concluded that the scientific adoption of package of practices along with the variety ICGV-91114 recorded the highest yield in comparison to other varieties tested in the farmers' fields. The highest increase in yield of 27.02 per cent was observed in the same variety. Thus the cultivation of ICGV-91114 along with scientific package of could be recommended to the farmers of Erode district of Tamil Nadu to enhance their production.

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