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Screening of Elite Groundnut (*Arachis hypogea* L.) Cultures Suitable for High Rainfall Areas of Andhra Pradesh

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Groundnut is an important self-pollinated oil seed crop grown in Andhra Pradesh. It is one of the major oil seed crops used for both edible oil and table purpose. Groundnut crop requires a rainfall of 400-500 mm. In North coastal zone of Andhra Pradesh, the annual rainfall ranges from 1100-1200 mm, which favours vegetative growth in groundnut grown in kharif season resulting in low yields. The main objective of the present study is to identify suitable varieties with high pod yield in high rainfall areas suitable to North Coastal Zone of Andhra Pradesh. Twelve elite groundnut cultures along with four checks are tested during Kharif 2022 at Agricultural Research Station, Yellamanchili. The results revealed that among all the entries, K1909 recorded significant pod yield of 2740 kg/ha followed by K 2313 with 2673 kg/ha when compared with the checks K 1812 (2488

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kg/ha), Dharani (1679 kg/ha), K-6 (1429 kg/ha) and Dheeraj (1307 kg/ha). These two groundnut cultures K1909 and K 2313 may be recommended to farmers of North coastal Zone of Andhra Pradesh for achieving good yields in Groundnut.

Keywords: Groundnut; screening; elite cultures; pod yield.

1. INTRODUCTION

Groundnut is an important self-pollinated oil seed crop grown in Andhra Pradesh. Groundnut cultivated over 40 m ha in world for food and table purpose [1]. It is one of the major oil seed crop used for both edible oil and table purpose. It is grown in more than 100 countries. India is second largest producer of groundnut after China, Pasupuleti et al. [2] in Andhra Pradesh it is generally grown during Kharif and Rabi. Groundnut crop requires a rainfall of 400-500 mm. The cultivated groundnut varieties are usually spreading and erect types. Groundnut crop in coastal high rainfall occurring areas, some varieties grow high from the ground due to heavy rainfall. In this condition, the pegs are unable to reach the ground resulting in poor pod formation and low yields. [3-5]. In North coastal zone of Andhra Pradesh, the annual rainfall ranges from 1100-1200 mm which is high for groundnut crop resulting in luxuriant growth especially during Kharif [6-7]. Most of the farmers in Andhra Pradesh are small and marginal farmers. Hence the main objective of this experiment is to screen the elite groundnut cultures with high pod yield suitable to North Coastal Zone of Andhra Pradesh.

2. MATERIALS AND METHODS

Twelve elite groundnut cultures along with four checks are tested at Agricultural Research Station, Yellamanchili, Anakapalle District, Andhra Pradesh. Agricultural Research station Yellamanchili located at latitude of 17.33^0 N and longitude of 83.520 E with 28.62 m. altitude. Twelve elite groundnut cultures developed from Regional Agricultural Research Station, Tirupathi, Agricultural Research Station, Kadiri and Agricultural Research Station, Yellamanchili are tested at Agricultural Research station Yellamanchili during Kharif 2022 season. The experiment is conducted using Randomized Block Design with three replications. Each entry is sown with six rows each of 5.0 m row length. All the recommended agronomic operations are adopted. The plant protection measures are adopted as and when required as per the recommendations. The experiment is conducted in light textured soils. The data is recorded for eight parameters *i.e.,*Plant height(cm), Days to maturity, Days to 50% flowering, Branches per plant, Pods per plant, Pod yield per ha (g), Shelling %, Test Weight (g). The data is statistically analysed using OPSTAT statistical software.

3. RESULTS AND DISCUSSION

Groundnut crop is self-pollinated crop requires rainfall of 400-500 mm. Spreading and bunch type groundnut varieties are available. Higher pod yields are observed in spreading type and short stratured plant types where the groundnut pegs can reach the ground easily and pod formation initiates. In North coastal zone of Andhra Pradesh due to heavy rainfall, the groundnut crop shows vegetative growth to a high strature. Due to high strature of the plant, the pegs hang up in the air and unable to reach the ground, affecting pod development resulting in poor pod yields. This is the major problem faced by the farmers in North coastal districts of Andhra Pradesh. Hence in groundnut, short stratured and spreading type of groundnut varieties are more desirable. The statistical analysis showed significance difference between the genotypes in pod yield per plant. Among all the groundnut cultures K 1909 recorded significant highest Pod yield (Kg/ha) of 2740 kg /ha followed by K 2313 with 2673 kg/ha. The ground culture K 1909 recorded plant height of 58.5 cm with spreading nature close to the ground and K 2313 also recorded plant height of 43.3 cm with short strature. Due to high rainfall and cloudy days the duration also extended by 5-7 days compared to their actual duration. The Check K 1812 recorded 2488 kg/ha with 47.1 cm; Dharani recorded 1679 kg/ha with a plant height of 76.3 cm; Kadiri-6 recorded 1429 kg/ha with plant height 73.5 cm and Dheeraj recorded 1307 kg/ha with 71.9 cm plant height. Highest shelling percentage is recorded for Dharani (71.73%) followed by Kadiri-6 with 68.14% followed by K-2313 with 67.33%. (Table 1). The results are in accordance with Hamid et al. [8], Janila *et.al*. [1], Shukla & Rai [9], Kumar *et.al.* [4]; Vekaria [10] Kona *et.al.* [3].

Table 1. Pod yield parameters of Groundnut (*Arachis hypogea* L.)

S.NO	Entry	Plant height (cm)	Days to maturity	Days to 50 % flowering	Branches per plant	Pods per Plant	Pod yield kg/ha	shelling %	Test weight (g)
1	K1909	58.5	136	35	6	45	**2740***	54.39	30.0
2	K 2313	**43.3**	133	31	8	41	**2673***	67.33	38.5
3	K 1812 ©	47.1	136	32	6	31	2488	66.51	38.0
4	TCGS 2233	45.7	138	28	7	49	**2345**	65.98	36.0
5	TCGS 1862	42.1	137	24	7	39	**2113**	65.37	43.5
6	TCGS 1872	63.9	137	31	7	40	2075	64.14	38.0
7	TCGS 2104	59.1	133	24	6	37	2035	65.50	45.5
8	TCGS-1707	55.7	137	28	6	36	1816	64.88	31.5
9	TCGS 1877	67.0	133	23	6	35	1787	65.00	39.5
10	YLG-4	55.7	133	23	6	34	1748	63.20	35.0
11	Dharani ©	76.3	132	24	6	39	1679	71.73	37.5
12	TCGS 2117	50.9	136	24	7	40	1494	64.30	56.0
13	Kadiri 6 ©	73.5	132	21	5	23	1429	68.14	46.0
14	Dheeraj ©	71.9	133	21	5	31	1307	64.76	37.0
15	K 1736	53.8	137	32	6	29	1301	61.26	38.0
16	YLG-3	65.9	132	25	5	38	979	67.02	36.5
	CD	**12.8**	**1.25**	**1.66**	**0.89**	**12.23**	**741.52**		
	CV	**13.3**	**0.56**	**3.71**	**8.72**	**19.83**	**23.72**		

4. CONCLUSIONS

Groundnut cultures with significant high pod yield *i.e.,* K 1909 (2740 kg/ha) and K 2313 with (2673 kg/ha) are identified high yielding varieties suitable to high rainfall occurring areas of Andhra Pradesh. The above said varieties may be recommended to farmers after further testing procedures [11-13].

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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