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Revive Old Practices of Rainy Season Groundnut from Smart Agronomy of Summer Season Groundnut

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A B S T R A C T

An experiment field was laid out during summer season of 1998 and 1999 at Regional Research Station, Mainpuri, C.S. Azad University of Agriculture and Technology, Kanpur. The experimental soil was sandy loam with poor fertility status. The thirty three genotypes of groundnut were tested. The main objective was to find out the suitable genotypes for summer season groundnut. Among the tested genotypes D_4D_8-10, D_4D_8-14 and ICGV 93468 gave superior pod yield by 35.08 q/ha, 34.34 q/ha and 32.62 q/ha. The genotypes ICGV-96360 (25.94 q/ha), ICGV-95337 (24.90 q/ha), ICGV-95299 (23.14 q/ha), ICGV-95319 (22.10 q/ha), D.G. 40 (21.04 q/ha) and ICGV-95290 (20.34 q/ha) also gave considerable pod yield. The other tested genotypes were failed to gave expected pod yield during summer season. The incidence of pest almost absent except pod borer. Pod borer damaged the pods up to 20% - 51.85% during summer season in lower pod yielder genotypes. The incidence of viral disease was not noted but fungal disease affected the crop by 1-2%.

Introduction

The riverine belt of alluvial soil of Uttar Pradesh, India, having loamy sand, sandy loam, loam, sandy clay loam and light clay loam texture is most suitable for rainy season groundnut cultivation. In early 1980's groundnut was grown in U.P. on 0.30 million ha with production of 0.19 million tones. Since then both area and production have shown a steady decline due to various reasons. In 1997-98, the groundnut area was reduced to 0.13 million ha with a total production of 0.10 million tones. Effort to arrest this decline in area and production did not succeed due to various biotic and economic reasons (Singh, 2004 and Singh, 2005). A strong need was felt to develop a suitable technology for groundnut

cultivation under moisture stress condition to revive groundnut in state. Since, the main function of National Agricultural Research Project, Mainpuri was to lead the groundnut research. The scientific team of project started the work of summer groundnut. International Crop Research Institute for Semi-Arid Tropics (ICRISAT) Patancheru provided 33 groundnut genotypes for evaluation during summer season in 1998. Genotypes ICGV 93468 of ICRISAT (now AVTAR) and D_4-D_8-6, D_4D_8-10 & D_4D_8-14 group of Dharwad (now Dh 86) gave very good performance during summer season and at initial stage these genotypes gave more than 30 q/ha pod yield after 85-90 days of planting. Due to high yield potential, low incidence of insect, pest and diseases, better survival under moisture stress condition, early maturity and thermo –tolerance, these aforementioned genotypes were considered safe for groundnut growers. On farm trials these genotypes yielded 35-40 q/ha, this was the first unprecedented success for dissemination and diffusion of groundnut during summer season in Uttar Pradesh. Thus, the area under summer season groundnut cultivation increased from scratch in 2001 to >40 lakh ha 2018 through farmers to farmers spread. Therefore, the performance of test genotypes during summer season is the subject matter of this manuscript.

Materials and Methods

The field study was under taken during summer season of 1998 and 1999 at Regional Research Station, Mainpuri, C.S. Azad University of Agriculture and Technology, Kanpur. The experimental soil was sandy loam, having pH 8.5, organic carbon 0.45%, total nitrogen 0.04%, available phosphorus 10 kg/ha and available potassium 278 kg/ha, thus the nutrients of experimental soil were analyzed low in organic carbon, total nitrogen, available phosphorus and high in available potassium. The pH was determined by Electrometric glass electrode method (Piper, 1950), while organic carbon was determined by Colorimetric method (Datta *et al.,* 1962).

Total nitrogen was analyzed by Kjeldahl's method as discussed by Piper (1950). The available phosphorus and potassium were determined by Olsen's method (Olsen *et al.*, 1954) and Flame photometric method (Singh, 1971), respectively. Thirty three genotypes of groundnut provided by ICRISAT, Patancheru, Telangana (Listed in Table -1) were tested. The groundnut genotypes were planted in 19th March and harvested on 15 June after 97 days of seeding during both experimental season of summer. The crop was fertilized with 20 kg N+30kg P_2O_5+45 kg K_2O+200 kg gypsum/ha. The irrigations were given at 20, 35, between 50-55 and 70-75 days of seeding. The crop was harvested on the residue moisture of irrigation given at 70-75 days after seeding as suggested by Singh (2004), Singh (2005), Singh (2006) and Singh (2007). The smart agronomical practices were followed as suggested by Singh (2004). The experiment was under taken in RBD with three replications. The experimental data of pooled years were statistically analyzed as suggested by Gomez and Gomez (1984).

Results and Discussion

The pooled data of two years were analyzed and reported in Table -1 and discussed here under appropriate heads.

Pod yield

Among the different genotype, tested during summer season D_4D_8-10, D_4D_8-14 and ICGV 93468 gave higher pod yield by 35.08 q/ha, 34.34 q/ha and 32.62 q/ha, respectively. Genotypes, ICGV-96360, ICGV-95337, ICGV-95299, ICGV-95319, D.G. 40, and ICGV-95290 also gave better yield during summer season plantation.

Table.1 Statement showing pod yield, pest incidence and disease incidence under different genotypes during summer season *(Pooled data of two years).*

Sl. No.	Genotype	Yield (q/ha)	Pest incidence (%)				Disease incidence (%)	
			Anarsia eppiphias	Jasid	Pod borer	White grub	Viral	Fungal
1.	ICGV-96337	1.76	2.00	0.00	21.42	0.00	0.00	1-2
2.	ICGV-96412	1.76	2.00	0.00	25.00	0.00	0.00	1-2
3.	ICGV-96395	2.10	1.00	0.00	20.00	0.00	0.00	1-2
4.	ICGV-96433	4.20	1.00	0.00	0.00	0.00	0.00	1-2
5.	ICGV-96443	7.00	2.00	1.00	5.25	0.00	0.00	1-2
6.	ICGV-96342	7.70	2.00	0.00	0.00	0.00	0.00	1-2
7.	ICGV-96332	11.92	1.00	3.00	0.00	0.00	0.00	1-2
8.	ICGV-96399	2.44	3.00	0.00	11.11	0.00	0.00	1-2
9.	ICGV-96365	7.00	1.00	2.00	8.33	0.00	0.00	1-2
10.	ICGV-96329	7.70	1.00	1.00	0.00	0.00	0.00	1-2
11.	ICGV-95290	20.34	1.00	1.00	2.43	0.00	0.00	1-2
12.	ICGV-95271	16.48	2.00	0.00	7.69	0.00	0.00	1-2
13.	ICGV-94357	9.46	3.00	2.00	7.69	0.00	0.00	1-2
14.	ICGV-94299	16.48	2.00	2.00	3.57	0.00	0.00	1-2
15.	ICGV-95299	23.14	6.00	1.00	6.66	0.00	0.00	1-2
16.	ICGV-95296	16.12	4.00	3.00	20.00	0.00	0.00	1-2
17.	ICGV-95319	22.10	2.00	0.00	15.38	0.00	0.00	1-2
18.	ICGV-95311	17.54	4.00	1.00	32.14	0.00	0.00	1-2
19.	ICGV-94313	14.38	5.00	1.00	3.33	0.00	0.00	1-2
20.	D.G.-40	21.04	2.00	1.00	0.00	0.00	0.00	1-2
21.	D_4-D_8-14	34.34	1.00	0.00	11.59	0.00	0.00	1-2
22.	D_4-D_8-6	12.62	1.00	0.00	14.54	0.00	0.00	1-2
23.	ICGV-96357	16.12	7.00	2.00	51.85	0.00	0.00	1-2
24.	ICGV-96356	18.24	3.00	0.00	22.50	0.00	0.00	1-2
25.	D_4-D_8-10	35.08	1.00	0.00	3.44	0.00	0.00	1-2
26.	ICGV-96360	25.94	2.00	0.00	0.00	0.00	0.00	1-2
27.	ICGV-96349	19.64	2.00	3.00	31.63	0.00	0.00	1-2
28.	ICGV-96359	16.82	1.00	1.00	2.63	0.00	0.00	1-2
29.	ICGV-95337	24.90	2.00	2.00	4.00	0.00	0.00	1-2
30.	ICGV-93468	32.62	1.00	0.00	4.34	0.00	0.00	1-2
31.	ICGV-96453	8.06	2.00	0.00	0.00	0.00	0.00	1-2
32.	ICGV-93460	16.12	1.00	0.00	0.00	0.00	0.00	1-2
33.	ICGV-86158	4.90	2.00	2.00	0.00	0.00	0.00	1-2
	C.D. 5%	4.58	-	-	-	-	-	-

The order of performance of these genotype was ICGV-96360 (25.94 q/ha)> ICGV-95337 (24.90 q/ha)> ICGV-95299 (23.14 q/ha)> ICGV-95319 (22.10 q/ha)> D.G. 40 (21.04 q/ha) and >ICGV-95290 (20.34 q/ha). The other tested genotypes were failed in production of expected pod yield, during summer season. The results display that the better yield in aforementioned genotypes was due to suitability of climatic condition, resistant against to the thermal environment and harsh condition. Under this situation these varieties had maintained better source – sink relationship. It means amount of dry matter or photosynthetic produced by source organs translocated towards sink organ (economic part) and, produced higher yield. These results are commensurable to the findings of Panchbor and Shete (2010), Singh *et al.,* (2015), Singh *et al.,* (2016) and Singh *et al.,* (2019).

Pest incidence

The data recorded on Anarsia eppiphias, Jasid, Pod borer and White grub display that among these insect, pod borer damage the pod up to 51.85% in some tested genotype during summer season. The genotypes ICGV -96337 (21.42%), ICGV-96412 (25.00%), ICGV-96433 (20.00%), ICGV-95319 (20.00)%, ICGV-95311 (32.14%), ICGV-96357 (51.85)%, ICGV-96356 (22.50%) and ICGV-96359 (31.63%) were displayed damaged of pods by pod borer. The incidence of white grub was found nil during summer season.

Disease incidence

The incidence of viral disease was not seen but incidence of fungal disease was noted 1-2%.

The farm families residing in the riverine tract of Uttar Pradesh, where, groundnut cultivation is in vigour may be advocated for cultivation of D_4D_8-10 and D_4D_8-14 (both varieties released by name Dh-86) and ICGV 93468 (AVTAR) for obtaining maximum pod yield during summer season.

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