

ALR. 1 - DISEASE RESISTANT GROUNDNUT VARIETY

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ABSTRACT

An improved groundnut strain ALR. 1 was released for cultivation in Pollachi tract of Tamil Nadu. This was developed from the cross POL. 2 x PPG. 4. The new strain is resistant to rust and late leaf spot diseases coupled with yield.

Key words : Groundnut, ALR. 1, Disease resistance, Rust, Late leaf spot.

Groundnut is a major oilseed crop grown during April-May season in the Pollachi tract. The summer showers and the South west monsoon hamper in taking control measures for diseases thereby causing a heavy loss in yield due to severe damage caused by rust and late leaf spot. None of the released varieties available at present are resistant to diseases, in particular, to rust. Attempts were made to develop a groundnut variety resistant to both the diseases and the result of such an attempt is reported.

MATERIALS AND METHODS

Hybridisation was effected during Kharif'80 season involving POL.2, Co.1, TMV.2, TMV.7, TMV.11 and OSN.2 as ovule parents and rust resistant donor cultures PPG-2, PPG-3 and PPG-4 as pollen parents. All the above cross combinations were forwarded to the Kharif'81 season. In F₂ generation scoring for diseases reaction was done and plants with resistance to rust and late leaf spot diseases were identified in the cross POL.2 x PPG.4. The resistant plants were carried to next generation with culture number AFDRS. 20 to study the family performance sele-

cted from F₃ generation during '83. The culture was tested over five seasons at Agricultural Research Station, Aliyarnagar from 1984 to 1986 and in three large scale demonstration trials and 21 on farm trials in and around Pollachi tract during Kharif'86. The culture AFDRS.20 was also tested for its reaction to rust and late leaf spot under controlled condition as suggested by Castellani (1959). Incidence of rust and late leaf spot diseases were scored based on 9 point disease scale (Subrahmanyam *et al.*, 1980).

RESULTS AND DISCUSSION

The culture AFDRS-20 recorded a mean yield of 1748 kg/ha. in station trials over five seasons (Table-1). The dry pod yield recorded by the culture AFDRS 20 was 11.7 per cent over JL 24 and 2.8 per cent over Co.2.

The average yield performance of culture AFDRS.20 in on farm trials under rainfed condition at 21 locations and large scale demonstration in 3 locations is furnished in Table.2. Its superiority in performance was evident from the large scale demonstration trial. This culture gave a mean pod yield of 2264 kg/ha. against 1341 kg/ha

Table 1. Performance of ALR. 1, at Agricultural Research Station, Aliyarnagar.

Culture/Variety	Dry pod yield (kg/ha)					Mean pod yield kg/ha	% on Co. 2	% on JL. 24
	1984	1984	1985	1985	1986			
	K	S	(FDRVT)	K	(MLT) S			
ALR. 1	1453	1237	1889	1571	2593	1748	102.8	111.7
JL. 24	1350	1157	1648	836	2836	1565	92.0	100.0
Co. 1	1450	1297	1434	753	1916	1730	80.5	87.5
Co. 2	1400	1294	1700	998	3115	1701	100.0	108.7
SE	108.0	124.6	119.3	41.6	59.6			
CD	338.7	357.6	342.4	119.4	165.3			

Table 2. Over all performance of ALR,1 (AFDRS.20)

Culture/variety	Dry yield kg/ha			Mean yield kg/ha.	% on Co. 2	% on JL.24
	Station Trial (Average of 5 seasons)	On farm Trial (21-trials)	Large scale demonstration Trial. (3 loca- tions)			
ALR.1 (AFDRS-20)	1748	1510	2264	1840	123.4	125.8
JL.	1575	1360	-	1462	98.1	100.0
CO.1	1370	-	-	1370	91.9	93.7
CO.2	1701	1280	-	1490	100.0	101.9
POL.2	-	1322	-	1322	88.7	90.4
TMV.2	-	-	1941	1341	90.0	91.7

Table 3. Rust and late leaf spot (LLS) incidence of ALR.1 (AFDRS-2) and other varieties

Culture/ Variety	On-farm Trial		Station Trial		Large scale Demonstra- tion trial		Controlled condition	
	RUST	LLS	RUST	LLS	RUST	LLS	RUST	LLS
ALR.1 (AFDRS.20)	2.3	2.1	2.2	2.2	2.1	2.0	2.8	2.8
JL.24	8.2	6.4	8.1	7.4	-	-	8.8	8.0
CO.1	-	-	8.0	6.8	-	-	-	-
CO.2	7.4	6.1	7.0	6.9	-	-	-	-
POL.2	8.2	6.2	-	-	-	-	-	-
TMV.2	-	-	-	-	8.5	4.0	-	-

Scale adopted : 1-9

Table 4. Economic Attributes of ALR.1

Character	ALR.1	JL.24	POL.2	CO.2	TMV.2
Pod yield kg/ha	1840	1462	1322	1490	1341
Shelling %	70.0	75.0	78.6	76.0	76.7
Haulms yield kg/ha	5290	3410	3080	3475	3130
Duration (Days)	120	105	105	105	105
Oil content (%)	50.34	48.64	47.40	49.25	49.23

registered by TMV.2 still a ruling variety with the farmers. In on farm trials, this cultivar registered an average yield of 1510 kg/ha.

The overall yield performance of the cultivar revealed its superiority over other cultivated varieties by recording an average pod yield of 1340 kg/ha which is 25.8 per cent and 23.4 per cent over JL. 24 and Co 2 respectively.

Pollachi tract is experiencing heavy losses in groundnut yield due to rust and late leaf spot diseases and the yield loss due to the above diseases was estimated to be upto 21% and in the TMV 2 which is the ruling variety under rainfed condition, the yield loss goes even upto 40%. The cultivar AFDRS-20 was scored for rust and late leaf spot in Research Station trials and farm trials and large scale demonstration trials and is given in Table-3. In all the trials the cultivar AFDRS-20 has recorded the intensity of 2.1-2.3 for rust and 2.0-2.1 for late leaf spot there by showing its resistance to both the diseases. It is evident that ALR. 1 is having resistance to both the major diseases of groundnut coupled with increased yield over the cultivated varieties.

The economic attributes of the cultivar has been presented in Table 4. The cultivar has recorded the highest haulms yield of 5920 kg/ha. There is a slight increase in the oil content over other cultivated varieties. The comparatively less percentage of shelling is compensated by increased pod yield. The cultivar is 15 days more in duration than other varieties. Since there will be no crop under rainfed condition in Pollachi tract after groundnut, this is well suited in cropping rotation without affecting the following crop.

In view of the above desirable attributes, the culture AFDRS. 20 was released during January 1987 as ALR. 1 for cultivation in rust and leaf spot affected areas in Tamil Nadu, particularly in Pollachi tract.

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