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131

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A Report of the Research Work done during 1976-77

SORGHUM AND MAIZE

SORGHUM BREEDER

Department of Botany

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** C O N T E N T S **

A REPORT OF SORGHUM AND MAIZE RESEARCH WORK 1976-77.

Sr. No.	Particulars	Page No.
I)	SORGHUM	
	Introduction	1
	Season (Kharif & Rabi)	1
A)	Kharif Jowar	
	Part-I	
	i) Plant breeding	5
	ii) Agronomy	28
	iii) Entomology	33
	Part-II.	40
B)	Rabi Jowar	
	Part-I.	
	i) Plant breeding	44
	ii) Agronomy	66
	iii) Entomology	89
	Part-II.	100
II)	MAIZE	
	Introduction	1
	Season	1
A)	Plant Breeding	
	i) Part-I	2
	ii) Part-II	16
B)	Agronomy	
	i) Part-I	17
	ii) Part-II	26
C)	Entomology	
	i) Part-I	27
	ii) Part-II	35

S O R G H U M

INTRODUCTION:

Sorghum is an important food & feed Crop of India. It occupies largest area (~~486~~ 158.57 hectares) in the country.

In the year 74-75 the area under kharif & rabi jowar in India was 96.99 & 61.58 lakh hectares & production was 70.00 & 32.21 lakh tonnes respectively. In Maharashtra the area under kharif and rabi jowar was 25.29 and 35.08 lakh hectares and production was 20.58 and 15.64 lakh tonnes, respectively. The average yields of kharif and rabi jowar in the state stand at 814 kg and 446 kg/ha respectively.

The area under jowar cultivation in Maharashtra is about 50% of the totalarea under food crops. It is therefore, imperative to give due attention to this crop for increasing overe-all food production of the state.

SEASON

The kharif research work was carriedout at Agricultural Research Station Jalgaon, Digraj, Dhula Gadhinglaj Karad and Rahuri and Rabi research at Sorghum Improvement Project centralcampus, Rahuri and Agricultural Research Station Mohol.

The climatic conditions in relation to crop growth is summer--ised below and rainfall data is given in Table-1.

i) Kharif

1. Agricultural Research Station, Jalgaon :

Monsoon commenced from 6th June with 23.8 mm. rainfall, further no showers were received till July, In July 55 mm. rains was received on 5 th and continued for a week. The sowings were done in the 2 nd week of July. Germination and stand of the crop was good. However, due to continueous dry spell during last period of crop growth (Sept. & October) the grains of late maturing varieties were shrivelled which res--ulted in low yields.

There was incidence of shootfly, aphids and midge which was controled effectively by timely dusting and sprayings.

2) Agricultural Research Station, Digraj:

The reinfall during the month of July and August was well distribuled which favcured the crop growth. Delayed plantings were affected by stemfly. The incidence of midge on CSH-1 was severe though the dusting of 10 % BHC was undertaken.

3) Agricultural Research Station, Dhule :

Monsoon started on 4 th June 1976 with 10 mm. rainfall and continued upto 9 th June,76. There was break up to 26th June. During the break period all tillage operations were completed. Again there were continuous showers. Which were sufficient for sowing and germination. Mo of the sowings were completed by June end.

4) Agricultural Research Station, Gadhinglaj:

The totalrainfall received in 46 rainy days was 888.5 mm. The sowing was undertaken on 11-7-1976. The germination was good.

Due to the continueous rains in September, October and No -mber the grains were affected heavily by moulds. It was observed that VCC-2-27 and Lavkush were affected heavily. The quality of fodder was also affected, due to leaf spots.

5) Agricultural Research Station Karad:

The pre-monsoon rains were not received which delayed the preparatory tillage and sowings.

The total rainfall received was 683 mm. in 79 rainy days. The sowing were carriedout in the month of July 76. The heavy rains rece during 2nd fortnight of July caused water stagnation in the experimental plots due to which germination and crop growth was badly affected. Due to rainy and cloudy conditions, there was heavy incidence of pests and disea In general the season was unfavourable for the crop and all the trials were vitiated.

ii) Rabi

1) Sorghum Improvement Project Central Campus Rahuri :

The total rainfall received during the year was 350.6 mm. in 56 rainy days.

In kharif two irrigated trials were conducted, the sowing of which was completed on 1st July 76. The germination and crop stand was good.

In rabi, sowings were completed in 3rd and 4th week of September. The germination was satisfactory.

There was moderate incidence of shootfly and midge in kharif and rabi trials which was controlled effectively by spraayings and dustings.

The late rains received in the month of October and November, helped the late maturing varieties.

In general seasonwas favourable for the crop.

2) Agricultural Research Station, Mohol:

The rabi season-1976-77 was most abnormal. It was characterised by good rains in August but very scanty rains during sept-oct monthes; which received 25.1 & 18.7 mm. rains as againest 25 years average of 178.6 & 96.6 mm respectively. Because of this peculiar soilmoisture condition sorghum crop suffered badly during its cariticle stages of growth. It had a very slow and stunted growth for a long time. The panicle exsertion and grain setting was alsopoor. As a result, there was a considerable reduction in the grain and fodder yields. This year would have been a famine year but for clowdy weather during the monthes of October-November and parts of December, with little rains in the middle of November.

The ibidence of shootfly was fairly high on the early sown jowar crop. Infestation of earhead bug, earhead worms and also that of midge was not so severe. Incidence of leaf diseases was negligible.

ble-1. Rainfall data at different Agricultural Research Stations during 1975

Month	Jalgaon		Dhule		Karad		Digraj		Gadhinglaj		Rahuri		Mah	
	Rainfall in mm.	No. of rainy days	Rainfall in mm.	No. of rainy days	Rainfall in mm.	No. of rainy days	Rainfall in mm.	No. of rainy days	Rainfall in mm.	No.of rainy days	Rainfall in mm.	No.of rainy days	Rainf in mm	
January	-	-	-	-	-	-	-	-	-	-	1.6	1	-	
Feburary	-	-	-	-	-	-	-	-	-	-	-	-	-	
March	-	-	-	-	11.9	3	22.5	5	130.0	3	7.6	2	2.5	
April	-	-	-	-	12.2	1	16.0	3	8.0	3	4.7	1	8.0	
May	-	-	-	-	14.2	1	6.7	2	-	-	-	-	-	
June	117.0	9	281.0	12	277.5	11	154.5	13	170.0	11	125.5	11	69.1	
July	290.6	21	189.2	17	143.3	21	118.5	19	205.0	18	80.2	15	69.6	
August	125.2	20	161.7	15	82.5	20	116.0	12	138.0	21	51.8	10	181.9	
Suptember	69.8	14	40.3	10	33.8	14	67.0	10	99.0	18	20.0	8	46.6	
October	-	-	-	-	48.7	2	12.0	3	65.5	3	13.2	3	18.7	
Nobember	82.8	4	93.4	6	59.0	6	108.3	8	72.0	0	45.6	4	26.6	
December	-	-	-	-	-	-	-	-	-	-	0.4	1	-	
Total	485.4	68	765.6	60	683.4	79	621.5	75	888.5	86	350.6	56	423.0	

A) Kharif Jowar

i) Part I. Plant breeding

1) Advanced Sorghum Hybrid trial:

This trial was conducted at Jalgaon, Dhule Digraj and Rahuri. The details of the experiment at different locations are as below.

a) Object	: To study the comparative per-formance different Hybrids.
b) Year od comencement	: 1976-77.
c) Desigon	: R.B D.
d) Plot size: Gross	: 8.1 x 2.7 m.
Net	: 7.5 x 1.8 m
e) Replications	: Three
f) Results	: Table 2 (a) 2 (b)

CONCLUSIONS:

Rahuri: The differences in grain yield were significant. The new hybrid SPH-10 and SPH-32 have given significantly superior grain yield over check CSH-1 and SPH-39, SPH-33 SPH-61, SPH-58, SPH-59 and CSH-5 are on par with SPH-10. The hybrid SPH-33 gave significantly highest fodder yield over check and other hybrids.

Jalgaon: Grain and fodder yield differences are significant. Comparing wi grain yield produced by CSH-1, the hybrids significantly superior are SPH-61, SPH-32 SPH-10 and SPH-24. The hybrid SPH-33 produced highest fodder yield and is at par with the SPH-58 and SPH-32.

Digraj: The results are statistically significant. The hybrid SPH-61 has to yielded all the hybrids and has recorded 3274 kg/ha. but is on par with released hybrid CSH-5, SPH-32.

Dhule: The results are highly significant. The hybrid SPH-61 has given significantly highest yield of 7033 kg/ha grains over check CSH-1 The fodder yield of SPH-32 is highest and is on par with SPH-33.

Summary: The hybrid SPH-61 (296 A x CS-3541) gave highest average yield of 5235 kg/ha followed by SPH-32 (4864 kg/ha) CSH-5 (4736 kg/ha) and SPH-10 (4579 kg/ha). This hybrid possesses bolder grains than CSH

The bybrid SPH-33 has given highest average fodder yield of 12 179 kg/ha followed by SPH-58 & SPH-32.

Table 2 (a) Grain and fodder yield.

Sr. No.	Hybrid	Grain yield kg/ha					Fodder yield kg/ha				
		Rahuri	Galgaon	Digraj	Dhule	Mean	Rahuri	Jalgaon	Digraj	Dhule	Mean
1.	SPH-4	3837	4227	2296	5496	3964	5926	10222	4815	10864	7957
2.	SPH-10	5052	5647	1978	5637	4579	5985	9037	8370	15308	9675
3.	SPH-24	4274	5578	2451	5637	4485	4961	9999	2296	9752	6747
4.	SPH-39	43855	5724	2570	5652	4525	4748	8370	4296	11234	7162
5.	SPH-33	4407	4617	2215	4615	3964	7904	12592	9333	18888	12179
6.	SPH-61	4578	6050	3274	7037	5235	5926	8518	6296	17407	9537
7.	SPH-57	4163	4699	1044	5778	3921	6422	10222	4148	14320	8778
8.	SPH-58	4444	4955	1474	5111	3996	6541	12444	6148	12407	10635
9.	SPH-59	4481	4696	1207	5615	4000	6015	10518	5778	13580	8973
10.	SPH-60	4356	5165	1577	4970	4017	5730	8518	5630	10246	7456
11.	CSH-1	3919	4267	940	4096	3306	3948	7555	815	7407	4931
12.	CSH-6	3733	4161	1950	4778	3656	4444	7037	2592	8518	5648
13.	CSH-5	4370	4936	3118	6519	4736	5059	8296	5926	13826	8277
14.	SPH-32	4874	5922	2851	5807	4864	5926	11333	6000	19259	10630
	SE/ha.	236	404	205	279		396	639	385	902	
	CD/ha.	686	1252	598	807		1151	1856	1119	2622	

Table 2 (b) Days to 50 flowering and plant height.

Sr. No.	Hybrid	50% flowering days					Plant height cms.				
		Rahuri	Jalgaon	Digraj	Dhule	Mean	Rahuri	Jalgaon	Digraj	Dhule	Mean
1.	SPH-4	64	67	75	64	67	168	189	148	196	175
2.	SPH-10	65	63	73	62	66	158	185	151	201	174
3.	SPH-24	60	70	69	59	64	144	178	159	222	176
4.	SPH-39	60	70	70	59	65	158	167	151	199	169
5.	SPH-33	67	65	76	66	68	170	178	156	215	176
6.	SPH-61	63	65	73	64	66	162	182	153	229	182
7.	SPH-57	63	63	75	61	65	153	194	150	201	175
8.	SPH-58	59	62	74	61	64	173	221	178	235	202
9.	SPH-59	59	72	72	57	62	150	176	150	199	169
10.	SPH-60	61	57	64	56	59	143	167	146	201	164
11.	CSH-1	61	59	70	56	61	130	139	154	176	150
12.	CSH-6	60	57	68	57	60	131	161	147	196	159
13.	CSH-5	68	66	73	63	66	144	182	158	197	170
14.	SPH-32	59	60	72	57	62	171	178	147	181	169

.....8/-

2)Preliminary Sorghum Hybrid trial

This trial was conducted at Jalgaon and Digraj.

a) Object :	:	To compares the performance of promising newly developed hybrids.
b) Year of commencement	:	1976-77.
c) Design	:	R.B.D.
d) Plot size Gross	:	8.1 x 2.7 m.
Net	:	7.5 x 1.8 m.
e) Replication	:	Three
f) Results	:	Table 3 ~~(a) and (b)~~

CONCLUSION:

Jalgaon:

Grain and fodder yield differences are significant. Although the grain yield results are significant, none of the hybrids has the yielded significantly superior over CSH-1. The entry SPH-29 produced highest fodder yield.

Digraj :

The released hybrid CSH-5 has given the highest grain yield (3629 kg/ha) and is on par with the hybrid SPH-24, CSH-6 SPH-66, SPH-64 & SPH-15.

Summery:

The hybrid SPH-66 (4176 kg/ha) and SPH-15 (6168 kg/ha) performed well at both the locations and are promising.

.....9/-

Table 3. Grain and fodder yield days to 50% flowering and plant height.

Sr. No.	Variety Hybrid	Grain yield kg/ha			Fodder yield kg/ha			50% flowering days			Plant height cm		
		Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	M
1.	SPH-60	5461	2340	3901	9037	3578	6308	56	72	64	170	116	1
2.	SPH-15	5321	3014	6168	9481	4530	7006	63	77	77	182	160	1
3.	SPH-6	5264	3088	4176	8296	4941	6619	58	69	63	163	145	1
4.	CSH-6	5101	3222	4162	7926	3333	5630	56	68	62	164	157	1
5.	SPH-65	4027	2903	3965	8148	4815	6482	57	69	63	181	171	1
6.	SPH-43	4842	2828	3835	8296	5800	7048	59	69	64	178	172	1
7.	SPH-13	4639	1933	3386	7999	4941	6470	58	71	64	164	144	1
8.	CSH-5	4630	3629	4130	9407	5311	7359	64	77	70	184	162	"
9.	SPH-67	4598	2274	3436	9407	5311	7359	65	77	71	184	152	"
10.	SPH-12	4580	2325	3453	8296	6422	7359	61	69	65	178	159	1
11.	CSH-1	4469	1933	3201	7034	4689	5863	57	70	63	145	131	"
12.	SPH-24	4400	3355	3878	7999	5430	6717	65	74	69	185	153	"
13.	SPH-63	4395	2955	3675	7185	4941	6063	61	73	67	115	115	"
14.	SPH-64	4124	3044	3584	7037	4444	5741	57	71	64	106	122	"
15.	SPH-45	4012	2866	3439	6667	4941	580	55	69	65	157	145	"
16.	SPH-29	3511	2348	2930	11704	6170	8937	68	77	72	180	157	"
	S.E./ha	359	232		449	187							
	C.D./ha.	1037	672		1296	539							

.....10/-

3) Large scale Hybrid-Trial:

This trial was conducted at Jalgaon and Digraj.

a) Object : To study the comparative performance of different hybrids developed at parbhani

b) Year of commencement : 1976-77.

c) Disign : R.B.D.

d) Plot size : Jalgaon Digraj

Gross : 8.4 x 2.7 m.

Net : 7.4 x 1.8 m.

e) Replications : Three

f) Results : Table-4.

CONCLUSIONS:

Jalgaon:

The hybrids 36 A x P.D. 3-1-11 (CSH-8 R), 36 A x 168, (CSH-7 R) 36 A x IS-3924 & 36 A x CS-3541 have given significantly superior grain yield over check CSH-1.

The hybrid 36 A x 285 stood first in fodder yield & it is significantly superior over other entries.

Digraj:

The results are statistically significant. The hybrid 36 A x 168 (CSH-7 R) has given highest grain yield (4557 kg/ha) & is on par with 36 A x P.D.3-1-11 (CSH-8 R). The new hybrid 36 A x CS.3541 has also given good yield and is on par with 36 A x P.D.3-1-11.

Summery:

It is interesting to note that newly developed rabi hybrids CSH-7 R, CSH-8 R and experimental hybrids 36 A x IS-3924 and 36 A x CS.3541 performed well at both the locations. However, these two hybrids suffer from grain mould if cought in the late rains.

.....11/-

Table 4. Grain and fodder yield, days to 50% bloom and Plant height: ..11..

Sr. No.	Variety Hybrid	Grain yield kg/ha			Fodder yield kg/ha			50% flowering days			Plant height		
		Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean
1.	36 A x P.D.3-1-11	4849	4074	4462	9535	5463	7499	64	81	72	171	150	1
2.	36 A x 168	4747	4537	4642	9009	5818	7414	63	79	71	177	195	1
3.	36 A x IS 3924	4202	2571	3417	8258	5107	6683	61	73	67	167	170	1
4.	36 A x CS-3541	4242	3639	3941	6907	4152	5530	63	76	69	162	175	1
5.	1036 A x PD 3-1-11	4197	2891	3544	10510	5933	8222	65	77	71	204	190	
6.	CSH-5	4161	3292	3727	8408	4394	6401	62	77	69	177	160	
7.	CK 60 A x CS-3541	4074	1894	2984	8258	4394	6326	58	74	66	170	150	
8.	1258 A x 168	4049	1881	2965	10886	5698	8292	60	74	67	210	180	
9.	1202 A x 168	3998	2215	3107	9909	4629	7269	59	78	68	180	160	
10.	2077 A x IS-84	3931	1204	2568	7357	2970	5164	59	75	67	140	95	
11.	CSH-4	3691	1709	2700	9535	3796	6666	60	77	68	189	170	
12.	1036 A x P.D.2-5	3601	2400	3000	10135	3205	6670	67	78	72	180	140	
13.	CSH-1	3446	819	2133	6907	2377	4642	57	79	68	148	140	
14.	3660 A x 370	3354	1452	2403	7507	3440	5474	58	75	66	188	180	
15.	1036 A x 168	3211	2599	2905	12162	5819	8991	62	78	70	226	210	
16.	36 A 285	2908	3141	3025	17868	6175	2022	70	81	75	258	195	
	S.E./ha	266	203	806	3006	395							
	C.D./ha	767	586	2326	8706	1140							

....12/-

4) Trial - Preliminary varietial trial-I.

This trial was conducted at Jalgaon and Digraj.

a) Object : To compare the performance of promisinng varieties.

b) Year of comencement : 1976-77.

c) Design : R.B.D.

d) Plot size Gross : 8.1 x 2.7 m.
Net : 7.5 x 1.8 m.

e) Replications : Three

f) Results : Table-5

CONCLUSIONA:

Jalgaon :

Grain and fodder yield differences are statistically significant The varieties SPV-69, SPV-59 have given good grain yields and are on par with CSH-1.

The variety SPV-111 has given significantly superior fodder yield.

Digraj :

The results of the experiment are statistically significant but none of the variety found superior to the hybrid CSH-5 and CSH-6. The variety SPV-115 has given 4970 kg/ha grain yield and is next best to CSH-5 and CSH-6.

Summery :

The new variety SPV-115 (4430 kg/ha) has given good grain yields at both the locations and appears to be promising. This variety has given 80 % of the best hybrid yield (CSH-5) and takes about no days tom mature.

.....13/-

Table-5.Grain and fodder yield, 50 % flowering days and Plant height.

Sr. No.	variety Hybrid	Grain yield kg/ha			Fodder yield kg/ha			50% flowering days			Plant height		
		Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean
1.	SPV-69	4420	2903	3661½	7630	3852	5741	61	77	69	122	137	130
2.	SPV-59	4410	3170	3790	6668	5037	5852	65	80	72	136	139	138
3.	CSH-5	4370	6177	5274	8741	8296	8519	68	74	71	186	183	185
4.	SPV-59/D	4358	3993	4158	7259	5630	6445	63	79	71	130	129	130
5.	CSH-6	4284	5466	4875	6444	5758	6111	58	67	62	152	195	174
6.	CSH-1	4247	4562	4405	7556	5333	6454	60	67	63	124	150	137
7.	SPV-59 c	4165	2444	3305	6667	7841	7254	67	81	74	159	167	163
8.	SPV-103	4148	3874	4011	8296	6667	7481	59	71	65	218	205	212
9.	SPV-112	4106	3614	3860	6148	5185	5666	59	70	64	166	166	1666
10.	SPV-115	3889	4970	4430	13704	83904	10897	67	82	74	174	164	189
11.	SPV-59 A	3852	2142	2997	12741	9630	11186	71	83	77	200	177	161
12.	CSV-3	3596	4333	4015	6148	5630	5889	65	80	72	165	157	158
13.	SPV-125	3309	2712	3011	9407	4667	7037	64	74	69	168	147	118
14.	SPV-70	3296	3251	3273	6815	5926	6370	70	82	76	118	118	157
15.	SPV-3	3271	3296	3284	7778	6148	6993	69	80	74	128	136	169
16.	SPV-59 B	3198	2437	2818	10889	10222	10556	70	81	75	162	151	210
17.	SPV-4	3074	4223	3649	7630	6518	7074	72	79	75	165	172	169
18.	SPV-113	3037	4193	3615	11851	7778	9815	63	73	68	211	208	213
19.	SPV-109	2395	1585	1990	15333	7841	11587	69	80	74	167	171	193
20.	SPB-129	2339	2207	2237	14814	9111	11963	76	84	80	230	195	154
21.	SPB-111	2301	2525	2413	15555	7111	11333	64	75	69	212	173	197
22.	SPV-110	2267	2550	2409	10740	4296	7518	70	82	76	165	143	138
23.	SPV-23	1750	3288	2519	14815	10,000	12408	70	90	80	220	173	
24.	SPV-114	1627	3607	2617	10519	10815	10667	76	88	82	135	140	

5) Preliminary varietial trial-II:

This trial was conducted at Jalgaon and Digraj.

a) Object : To compare the performance of promising varieties.

b) Year of commencement : 1976-1977.

c) Design : R.B.D.

d) Plot size: Groos : 8.1 x 2.7 m.
Net : 7.5 x 1.8 m.

e) Replications : Three

f) Results : Table 6

CONCLUSIONS :

Jalgaon :

Grain and fodder yield differences are statistically significant. Varieties SPV-138 and SPV-135 are at par with CSH-5 as far as grain yield is concerned. The variety SPV-73 stood first in fodder yield and is at par with SPV-119 and SPV-34.

Digraj :

The yields of different varieties and hybrids are poor due to less plant population and incidence of midge. The variety SPV-34 has out yielded rest of the varieties but is on par with CSH-5, SPV-33 and SPV-116. In this case of fodder the variety SPV-34 has out yielded 94.81 q/ha. but is on par with SPV-132 and SPV-73. These results will have to be confirmed.

....15/-

Table 6. Grain and fodder yield, 50% flowering days and Plant height:

r. No.	Hybrid	Grain yield kg/ha			Fodder yield kg/ha			50% flowering days			Plant height cms.		
		Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean
1.	CSH-5	4776	1785	3281	9481	5988	7704	64	75	69	177	168	173
2.	SPV-138	4511	-	-	9630	-	-	63	-	-	185	-	-
3.	SPV-135	4013	-	-	11999	-	-	67	-	-	138	-	-
4.	SPV-131	3733	814	2238	9778	6815	8297	62	72	67	163	161	134
5.	SPV-130	3659	459	2059	9037	4667	6852	61	74	67	147	116	132
6.	SPV-137	3617	-	-	15926	-	-	71	-	-	272	-	-
7.	CSH-6	3395	2088	2742	7407	5185	6296	56	65	60	153	156	155
8.	SPV-129	3331	844	2088	7259	3926	5593	64	75	69	182	175	151
9.	SPV-133	3301	1208	2255	7556	5778	6667	64	75	69	139	130	129
10.	SPV-120	3259	533	1896	12963	3407	8185	63	79	71	169	148	146
11.	SPV-117	3222	963	2093	7999	5778	6889	61	70	65	144	138	124
12.	GSV-3	3161	1438	2100	7037	4074	5556	65	76	70	155	138	147
13.	SPV-124	3152	577	1865	9481	6815	8148	67	79	73	189	170	144
14.	SPV-83	3124	-	-	6667	-	-	70	-	-	89	-	-
15.	SPV-136	3024	-	-	8370	-	-	64	-	-	171	-	-
16.	SPV-29	2987	-	-	8148	-	-	68	-	-	138	-	-
17.	SPV-95	2634	599	1642	8889	6518	7704	65	77	71	171	168	146
18.	SPV-121	2543	1785	2164	10593	8000	9297	66	78	72	223	141	172
19.	SPV-122	2511	570	1541	11630	3926	7778	70	80	75	149	125	135
20.	SPV-132	2324	1044	1684	10370	8741	9556	69	81	75	134	139	128
21.	SPV-134	2209	548	1379	9407	4148	6778	71	83	77	131	125	127
22.	SPV-116	2094	1245	1670	15037	5407	10222	67	78	73	165	155	143
23.	SPV-123	1997	1067	1527	10963	5555	8259	70	82	86	132	123	128
24.	SPV-126	1679	970	1325	10519	4889	7704	73	85	79	168	144	147
25.	SPV-118	1313	785	1049	12815	3333	8074	79	82	80	182	134	142
26.	SPV-119	1254	888	1056	19259	3259	11259	79	87	83	197	133	164
27.	SPV-34	1030	2525	1778	18377	9481	13926	81	89	85	180	148	156
28.	SPV-127	928	829	879	9111	3186	6149	75	85	80	97	109	111
29.	SPV-33	830	1681	1256	16667	3852	10288	94	88	91	140	125	136
	SPV-73	272	637	455	19630	8370	14000	81	79	80	220	157	171
	S.E./ha	312	196		752	672							

....16/-

6) Trial- large scale varietal trial :

This trial was conducted at Jalgaon and Digraj.

a) Object : To study the comparative performance of different varieties.

b) Year of commencement : 1976-1977.

c) Design : R.B.D.

d) Plot size : Gross : 8.4 x 2.7 m.
Net : 7.4 x 1.8 m.

e) Replications : Three

f) Results : Table-7.

CONCLUSIONS:

Jalgaon :

Grain and fodder yield differences are statistically significant. The new entry PV-1 (2791 kg/ha) stood first in grain yield and it was at par with grain yield produced by CS-3541 (2697 kg/ha) & 370 (2152 kg/ha) released varieties.

Digraj :

The grain yield differences due to the different varieties are statisticaly significant. The variety PV-2 has given best yield (2948 kg/ha) but is on par with PV-14, PV-3, PV-11, CS-3541, PV-10, PV-9 PV-5 and PV-4 varieties.

Most of these lines are still segregating for earliness, year, grain and developmental character. About518 selections at Digraj which would again be tested next year. These lines would be useful as straight varieties and also as restoress.

.....17/-

Table-7. Grain yield, Fodder yield, days to 50% flowering and plant height

Sr. No.	Hybrid	Grain yield kg/ha			Fodder yield kg/ha			50% flowering days			Plant height cms.		
		Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean
1.	PV-1	2731	1303	2407	7658	4038	3899	61	69	65	145	109	85
2.	CS-3541	2697	2429	2563	7282	8205	7744	66	75	70	126	118	122
3.	370	2152	1631	1892	5631	4038	4835	64	80	72	164	131	148
4.	PV-13	1890	912	1406	8634	3084	5859	64	78	71	116	139	128
5.	PV-14	1489	1839	1664	14039	4986	9513	65	79	72	201	165	183
6.	PV-8	1143	712	928	11637	2970	7304	66	82	74	156	122	139
7.	PV-10	1096	1645	1371	10736	4152	7444	59	82	71	145	127	136
8.	PV-12	996	1147	1072	13889	6054	9972	71	79	75	191	156	174
9.	PV-7	869	997	933	11111	2614	6863	70	82	76	133	117	125
10.	PV-5	861	1132	967	13514	3440	8477	72	83	77	177	149	163
11.	PV-6	568	762	665	11488	2612	7049	74	84	79	137	122	130
12.	PV-11	523	1752	1138	18618	6410	12515	75	84	79	215	177	131
13.	PV-3	511	1866	1189	13288	4273	8781	64	79	71	168	141	155
14.	PV-4	426	1239	833	13363	3084	8224	78	81	79	173	136	155
15.	PV-9	403	1253	8280	15916	2015	8966	77	83	80	174	122	148
16.	PV-2	588	2072	1230	12387	5463	8925	78	73	75	199	167	183
	S.E./ha.	190	301		1823	302							
	C.D./ha.	548	868		5263	872							

.....18/-

This trial was conducted at Rahuri, Jalgaon, Digraj, Dhule and Gadhinglaj.

a) Object : To study the comparative performance of promising varieties.

b) Year of commencement : 1976-1977.

c) Design : R.B.D.

d) Plot size : Gross : 8.10 x 2.70 m.
Net : 7.50 x 1.80 m.

e) Replications : Three

f) Results : Table-8 (a) and Table 8 (b)

CONCLUSIONS:

Rahuri :

The results are statisticaly significant. SPV-101 (6415 kg/ha) has given significantly superior grain yield and is on par with CSH-1 (5852 kg/ha) CSH-5 (5830 kg/ha), SPV-98 (4852 kg/ha) and SPV-59 (4849 kg/ha) also appear to be promising.

Jalgaon :

Grain and fodder yield differences are significnat. The grain yield of varieties. SPV-35, CSV-3 SPV-59, SPV-101 and SPV-102 is on far with that of CSH-5, CSH-1 and CSH-6. The variety B.S.-12-2-11 stood first in fodder yield and is statistically superior over the other entries.

Digraj :

The results are statistically significant. The hybrid CSH-5 has given the highest yield (49.33 kg/ha) and is on par with CSH-1, CSH-6 and SPV-35.

Dhule :

The results are highly significant. None of the released variety or hybrid has given significantly superior yield over the local.

Summary :

The newly developed varieties SPV-59, SPV-101 and SPV-35 appear to be promising in respect of grain yield and maturity. The first two flower in 71 and 73 days, while the third takes 65 day days. Such varieties would be useful in tracts where late rains are usually received.

10/-

Sr. No.	Hybrid	Grain yield kg/ha					Fodder yield kg/ha				
		Rahuri	Jalgaon	Digraj	Dhule	Mean	Rahuri	Jalgaon	Digraj	Dhule	Mean
1.	SPV-59	4889	3995	3599	3437	3980	7778	7630	3704	8888	7000
2.	SPV-95	3852	3481	2822	2822	3254	6422	6667	3333	8518	6235
3.	SPV-97	4719	3222	3585	2496	3505	15311	11259	6000	24197	14192
4.	SPV-98	4852	1827	2592	1762	2858	18148	14814	5556	25308	15957
5.	SPV-99	4185	3054	2903	2659	3200	8644	9111	5407	12592	8939
6.	SPV-100	4756	3000	2799	2400	3239	12348	9630	5556	10987	9630
7.	SPV-101	6415	3972	4007	4104	4625	9015	8370	5333	9752	8108
8.	SPV-102	4467	3859	2237	4074	3659	12348	12963	8222	16048	12396
9.	SPV-103	3667	3430	2340	2918	3089	9015	8370	5407	10740	8383
10.	SPV-104	4570	3707	2940	4148	3841	7407	10370	5630	12715	903
11.	SPV-105	4526	2863	2806	3748	3486	9756	12222	4667	15678	1058
12.	SPV-106	3530	2370	2170	3267	2859	13578	13928	5037	19135	1291
13.	SPV-107	-	3654	3370	3889	3638	-	10741	7259	20987	12996
14.	SPV-81	-	3313	3407	2852	3191	-	5037	4296	7777	5703
15.	SPV-35	4607	4321	3496	3904	4332	8644	6074	5407	9999	7531
16.	SPV-9	3815	1637	3666	1015	2533	16296	14963	6148	26913	16080
17.	SPV-13	4763	1909	3599	1089	2840	16541	17556	7111	24691	16475
18.	CSV-3	5126	4028	3162	4911	4307	8393	7407	4444	9629	7468
19.	CSV-4	3630	3301	3222	2659	3203	7778	9111	5259	12715	8716
20.	CSH-1	5852	5156	4762	3822	4898	7163	7407	6296	6666	8883
21.	CSH-6	5296	4899	4592	4333	4780	6296	7926	6296	7407	6981
22.	CSH-8	5830	5173	4933	4792	5282	9133	8296	7037	8518	8296
23.	SPV-80	4422	2830	2029	3222	3076	13578	15185	7852	19259	1369
24.	SDM-9	-	-	3659	-	3659	-	-	7778	-	7778
25.	P.S.12-2-11	-	1247	-	-	1247	-	27630	-	-	27630
26.	K-2-2-10	-	-	-	4252	4252	-	-	-	15678	15678
27.	SPV-109	3444	-	-	-	3444	12719	-	-	-	12719
28.	149	4148	-	-	-	4148	7533	-	-	-	7533
29.	Swarna	4763	-	-	-	4763	10985	-	-	-	10985
	S.E./kg/ha	401	480	217	321		893	1004	569	716	
	C.D.kg/ha	1143	1330	599	911		2545	3005	1620	2030	

.....20/-

Sr. No.	Hybrid	50 % flowering days					Plant height cms.				
		Rahuri	Jalgaon	Digraj	Dhule	Mean	Rahuri	Jalgaon	Digraj	Dhule	Mean
1.	SPV-59	60	64	77	63	68	143	140	160	170	154
2.	SPV-96	63	69	63	58	63	134	143	139	172	147
3.	SPV-97	79	72	81	60	73	180	196	158	202	184
4.	SPV-98	83	76	81	61	75	248	246	213	289	249
5.	SPV-99	66	60	78	61	64	166	163	159	181	167
6.	SPV-100	74	69	78	64	71	143	132	141	136	138
7.	SPV-101	77	69	81	67	73	178	147	163	161	157
8.	SPV-102	78	69	79	66	73	220	207	189	224	210
9.	SPV-103	76	65	77	63	70	173	180	187	152	174
10.	SPV- 104	77	69	80	70	74	185	191	168	213	139
11.	SPV-105	75	68	82	67	73	174	186	123	197	170
12.	SPV-106	78	71	82	67	74	161	188	132	193	168
13.	SPV-107	-	68	78	64	70	-	197	128	201	175
14.	SPV-81	-	65	72	66	68	-	98	119	117	111
15.	SPV-35	6	60.	67	64	65	132	129	126	144	133
16.	SPV-9	79	76	76	73	76	161	147	158	190	164
17.	SPV-13	82	78	78	72	77	211	225	204	243	221
18.	CSV-3	69	65	78	60	68	161	160	193	182	174
19.	CSV-4	79	69	76	70	73	117	157	130	139	186
20.	CSH-1	59	59	66	58	60	149	137	159	167	153
21.	CSH-6	59	58	63	57	59	137	165	180	183	166
22.	CSH-5	70	64	73	63	65	202	169	191	208	193
23.	SPV-80	78	76	81	64	75	173	227	203	192	186
24.	SDM-9	-	-	84	-	84	-	-	218	-	218
25.	B.S.12-2-11	-	99	-	-	99	-	323	-	-	323
26.	K-2-2-10	-	-	-	70	70	-	-	-	262	262
27.	SPV-109	72	-	-	-	72	154	-	-	-	154
28.	140	76	-	-	-	76	114	-	-	-	114
29.	Swarna	72	-	-	-	72	158	-	-	-	158

.....21/-

8) Parental line trial :

This trial was conducted at Jalgaon and Digraj.

a) Object : To compare the performance of parents involved in different hybrid combinations.

b) year of commencement :1976-77.

c) Design : R.B.D.

d) Plot size : Gross : 8.10 x 2.70 m.
Net : 7.50 x 1.80 m.

e) Replications : Three

f) Results : Table -9.

CONCLUSIONS :

Jalgaon :

Grain and fodder yield differences are significant. The maintainer line SPV-3 produced the highest grain yield, and was at par with the grain yield produced by CSV-4, 2947 B, 2219-B, IS-84 and CSV-3. Among the restorers CSV-5 produced the highest yield.

Digraj :

The grain differences are statistically sigificnat. However, the plant population was not uniform and there was heavy incidence of midge which affected the grains yield considerably and as such valid conclusions cannot be drawn.

Summary :

The new male sterile line 296 A apperas to be promising, since it is high yielding and its combination with CS-3541 has given the highest grain yield at most of the location. Nicking problems of CSH-5 could also be eliminated if this line is used in place of 2077 A. The grain size is also better than 2077 A.

.....22/-

Table 9. Grain and fodder yield, days to 50% flowering and plant height.

Sr. No.	Hybrid	Grain yield kg/ha			Fodder yield kg/ha			50% flowering days			Plant height cms.		
		Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Mean	Jalgaon	Digraj	Me
1.	SPV-3(296 E)	4050	2414	3232	8296	1852	5074	68	78	73	120	110	11
2.	CSV-4(Co.3541)	3684	2762	3228	9407	[illegible]	6000	68	72	70	116	125	12
3.	2047 B	3432	1570	2501	5704	2074	3889	65	74	69	114	123	11
4.	3677 B	3272	474	1873	7259	889	4074	57	69	63	125	126	12
5.	2219 B	3185	1414	2300	6296	2074	4185	54	67	60	94	109	10
6.	IS-84	3141	666	1904	6518	889	3704	60	67	63	116	109	11
7.	CSV-3(370)	3072	1637	2355	6074	1259	3667	65	78	71	143	107	12
8.	3660-B	2990	1162	2076	1037	1333	4185	64	73	68	140	130	13
9.	CS-3541(R.6)	2610	2518	2564	10740	1629	6185	73	78	75	120	105	11
10.	CK-60 B	2239	540	1394	6296	863	3639	60	71	55	107	105	10
11.	CSV-5 (160)	2136	2283	2219	10370	1630	6000	69	65	67	112	111	11
12.	IS-3691	2055	1051	1553	5037	518	2778	55	64	59	60	104	8
13.	641-1	1778	881	1330	9481	1741	5111	74	78	76	100	130	11
14.	CO-3541(R-12)	1684	1693	16902	10592	8791	5741	75	80	77	104	94	99
15.	2677-8	1561	1044	1303	7926	889	4408	68	85	76	103	120	11
16.	36-B	1264	1585	1425	7555	2000	4778	72	79	75	89	98	94
	S.E.kg/ha	422	213		477 401	267							
	C.D.kg/ha	1219	615		1157	770							

.....23/-

9) Lavkush Trial :

This trial was conducted at Jalgaon, Dhule and Digraj.

a) Object : To compare the performance of promising derivatives along with released varieties and an entry Lavkush (twin seeded) developed at G.I.C. Amaravati.

b) Year of commencement : 1976-77.

c) Design : R.B.D.

d) Plot size : Gross : 8.40 x 2.70 m.
Net : 7.40 x 1.80 m.

e) Replications : Three

f) Results

CONCLUSIONS :

Jalgaon :

Grain and fodder yield differences are significant. CSH-1 has produced the highest grain yield and is at par with S.S.12, CS-3541 and 370. The variety SDM-9 stood first in fodder yield and is at par with V.C.C.2-7. The late entries like SDM-9, VCC selections etc suffered heavily due to stress conditions. The S.S.-12 with white chalky grains having philipines origin was tried for the first time at this locations. The grain quality and bread quality of this variety is very poor.

Dibraj: The trial at Digraj was not propuly conducted and as such the yields are very poor. The stand was not good and the crop was heavily infested by midge.

Dhule: Results are highly significant But none of the variety is superior to CSH-1 in respect of grain yield du
The variety were affected due to stress conditions in Sept. and October.

Gadhinglaj: Variety 148 has given highest yield 4977 kg/ha. The variety 148 CS-3541 & CSH-1 have given significantly superior yield than local check SDM-9. The late selections including Lavkush did not do well.

Summary: The result of four locations clearly indicate that the variety Lavkush is definitely inferior to released hybrids and varieties. The same trend was also observed last year. This varieties is also not tolernat/resistant to shootfly and midge as was claimed earlier. The trial would be discontinued.

Table-10 (a) Grain and fodder yield.

Sr. No.	Hybrid	Grain yield kg/ha					Fodder yield kg/ha				
		Jalgaon	Digraj	Dhule	Gadhinglaj	Mean	Jalgaon	Digraj	Dhule	Gadhinglaj	Me
1.	CSH-1	4890	1424	4829	4676	3955	7283	1282	11633	10558	768
2.	CS-3541	3516	1346	3718	4751	3333	10736	3849	14601	10558	968
3.	370	3441	627	3006	4071	2787	7357	2849	8665	5279	603
4.	143	2423	684	2892	4977	2744	11411	1949	10208	7542	777
5.	V.C.S.2-26	1717	719	527	2187	1288	15240	1923	20180	7542	112
6.	Lavkush	1794	206	1261	2262	1381	10360	1211	21605	9050	105
7.	V.S.C.2-7	861	789	385	2262	1074	21771	2849	22316	4525	131
8.	D.D.M-9	578	1310	1545	3545	1744	24999	3988	15430	12821	145
9.	S.S.-12	4788	-	-	-	1 : 12	14414	-	-	-	144
10.	V.C.C.-2-23	2162	-	-	-	-	18018	-	-	-	180
11.	V.C.C.-2-8	1914	-	-	-	-	21021	-	-	-	210
12.	V.C.C.-2-20	1532	-	-	-	-	14789	-	-	-	147
	S.E./ha	210	244	262	370	-	1101	-	543		
	C.D./ha	616	741	791	421	-	3228	-	1638		

.....25/-

Table-10 Days to 50% flowering and plant height.

Sr. No.	Hybrid	50% flowering days			Plant height in cms.			
		Jalgaon	Gadhinglaj	Mean	Jalgaon	Dhule	Gadhinglaj	Mean
1.	CSH-1	56	61	58	125	192	147	169
2.	CS-3541	68	73	67	124	149	184	139
3.	370	64	75	70	150	179	134	140
4.	148	69	71	71	110	220	37	124
5.	V.C.C.-2-26	80	77	75	165	265	177	181
6.	Lavkush	76	63	71	240	298	177	217
7.	V.C.C.-2-7	71	76	76	208	233	150	179
8.	S.D.M.-9	98	73	87	234	319	259	246
9.	S.S.-12	66	-	66	144	-	-	144
10.	V.C.C.-2-23	69	-	69	207	-	-	207
11.	V.C.C.-2-8	71	-	71	214	-	-	214
12.	V.C.C.-2-20	80	-	80	195	-	-	195

10. Seed Production:- At A.R.S. Jalgaon 594 kg V.C.C.-2-7 and 547 kg V.C.C.-2-26 seed was produced.

At A.R.S. Digraj 300 kg seed of S.D.M.-9 was produced.

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Summary of Results:

1) Advanced Sorghum hybrid Trial:

The trial was conducted at Agril. Research Station, Jalgaon, Digraj, Dhule and Central Campus Rahuri.

The hybrid SPH-61 gave highest average grain yield of 5235 kg/ha followed by SPH-32 (4864 kg/ha), CSH-5 (4736 kg/ha) SPH-10 (4579 kg/ha). The hybrid SPH-61 appears to be promising. This hybrid has bold grains and high yield which is a advantage over CSH-5.

2) Preliminary Sorghum hybrid Trial:

The trial was conducted at Agril. Research station Jalgaon and Digraj.

The mean performance of SPH-66 (4176 kg/ha) and SPH-15 (6168 kg/ha) was better than rest ~~is~~ of the entries.

3) Large scale Sorghum hybrid Trial:

This trial was conducted at Jalgaon ~~of~~ and Digraj.

It is interyesting to note that the newly developed rabi hybrids CSH-7 R (4642 kg/ha) and CSH-8 R (4462 kg/ha) perforamed well at both the locations in kharif season. The experimental hybrids 36 A x IS-3924 (3416 kg/ha) and 36 A x CS-3541 (3941 kg/ha) are also showing promise. However, these two hybrids suffer from grain moulds if caught in the late rains.

4) Preliminary varietal Trial-I:

This trial was conducted at A.R.S. Jalgaon and Digraj.

The new variety SPV-115 (4430 kg/ha) has given good grain yields appears to be promising. This variety has given 80% of the best hybrid grain yields (CSH-5) and takes about 120 days to mature. The released variety CSV-3 gave (4015 kg/ha) grain yield.

5) Preliminary varietal Trial-II:

This trial was conducted at Agril. Research Station Jalgaon & Digraj.

The grain yields at Digraj are poor due to low plant population and incidence of midge. The mean performance of CSH-6 (2742 kg/ha) is good at both the locations followed by SPV-133 (2255 kg/ha).

The entries SPV-138, (4511 kg/ha) & SPV-135 (4013 kg/ha) have given good grain yield at Jalgaon and are at par with CSH-5 (4476 kg/ha).

.....27/-

6) Large scale varietal Trial:

This trial was conducted at Jalgaon and Digraj.

The entry PV-1 (2791 kg/ha) and PV-2 (2072) pefformed well at Jalgaon and Digraj respectively. Most of the lines are still regarding for earliness, ear size, grown size, plant type etc. Individuel plant selections have been effected in different entries, which would be given next year.

7) Advanced Sorghum varietal Trial:

This trial was conducted at A.R.S. Jalgaon, Digraj, Dhule, Gadhinglaj.

The newly developed varieties SPV-59 SPV-101 and SPV-35 appear to be promising in respect of grain yield and maturity. The first two flower in 71 and 73 days, while the third takes 65 days. Such varieties would be useful in tracts where late rains are usually received.

8) Parental line trial:

The new male sterile line 296 A appears to be promising. Its combination with CS-3541 has given the highest grain yield at most of the locations. Nicking problems of CSH-5 could also be eliminated if this line is used in place of 2077 A. The grain size is also better than 2077 A.

9) Lavkush Trial:

This trial was conducted at Agril Research Station Jalgaon, Dhule, Digraj and Gadhinglaj.

The results of the four location clearly indicate that the variety Lavkush is definitely inferior to released hybrids and varieties.

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ii) AGRONOMY

I) Agricultural Research Staton Jalgaon and Digraj:

1 (a) Title : Intercropping studies

(b) Object: To findout the best combination of intercropping with jowar.

(c) General information :

i) Year of the experiment : Second

ii) Treatments : 10

1) Sorghum alone (45x15 cm) CSH-5
2) Uniform rows of Sorghum CSH-5 (60 cm) + Greengram
3) –"– + Blackgram
4) –"– + Groundnut (SB XI)1
5) –"– + Cowpea(Halavi)
6) –"– + Soybean (J.2)
7) –"– + Redgram(No.148
8) –"– + Castor(Aruna)
9) –"– + Sunflower (EC.68414)
10) –"– + Sesamum(D-7-11 -1)
11) –"– + Horse gram (Co-1-1-8)

Spacing within the row of intercrops

Greengram, Blackgram, Groundnut and Soybean 10 to 15 cm Cowpea 20 cm Redgram and castor - 40 cm. Sesamum - 15 cm and Sunflower - 30 cm.

iii) Design : R.B.D.

iv) Replications : Four

v) Plot size.

Jalgaon

Gross: 10.0 mx 4.8 m. = 48.0 m^2

Net : 8.0 m x 3.6 m. = 28.8 m^2

Digraj:

Gross: 7.30 m x 5.30 m = 38.69 m^2

Net : 5.50 m x 3.49 m = 19.20 m^2

vi) Manures and fertilizers:

12.5 C.L. of F.Y.M. + 80 kg N + 60 kg P_2O_5 + 40 kg K_2O/ ha.

d) Results : Table 11

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Table 11: Grain and fodder yield q/ha with total returns Rs/ha.

Sr. No.	Treatments	Jowar grain Jalgaon	Jowar grain Digraj	Jowar grain Mean	Inter crop grain Jalgaon	Inter crop grain Digraj	Inter crop grain Mean	Jowar fodder Jalgaon	Jowar fodder Digraj	Jowar fodder Mean	Total Returns in Rs/ha Jalgaon	Total Returns in Rs/ha Digraj	Total Returns in Rs/ha Mean
1.	Sorghum alone	19.58	28.95	24.26	-	-	-	81.60	37.08	59.34	2447.20	4052.00	3249.60
2.	*Sorghum+ Green gram*	14.57	20.67	17.62	2.40	5.93	4.16	79.51	29.97	54.74	2304.74	3755.18	3030.00
3.	-"- + Black gram	18.18	20.98	19.58	2.15	2.81	2.48	61.11	27.97	44.54	2558.99	3536.43	3067.70
4.	-"- + Groundnut	20.76	20.41	20.58	0.08	0.72	0.40	68.40	21.64	45.02	2771.04	3072.89	2922.00
5.	-"- + Cowpea	14.11	15.67	14.89	3.76	3.69	3.72	62.85	24.74	43.79	2329.90	2749.96	2540.00
6.	-"- + Soyabean	19.27	9.99	14.63	2.51	2.65	2.58	73.26	22.13	47.69	2663.74	1937.48	2300.60
7.	-"- + Redgram	22.48	17.13	19.80	0.45	7.65	4.05	72.57	18.23	45.40	2844.08	3546.85	3195.00
8.	-"- + Castor	16.19	6.40	11.29	-	17.81	17.81	77.08	15.62	46.35	2089.22	2682.27	2385.70
9.	-"- + Sunflower	13.32	5.83	9.57	2.90	11.56	7.23	61.46	16.25	38.85	2189.54	3901.01	3045.30
10.	-"- + Sesamum	16.06	-	16.06	-	-	-	67.36	-	67.36	2036.04	-	2036.04
11.	-"- + Horse gram	-	13.33	13.33	-	10.78	10.78	-	21.46	21.46	-	3057.27	3057.27

Prevailing Market Prices of grain Rs/q.

	Jalgaon	Digraj
Groundnut	200	285
Sesamum	300	-
Sunflower	165	250
Green gram	160	145
Black gram	165	210
Cowpea	140	150
Soybean	100	200
Redgram	180	150
Castor	225	100
Jowar	110	125
Horse gram	-	125

CONCLUSIONS:

At Agricultural Research Station, Jalgaon Sorghum + Redgram treatment produced the maximum grain yield and gave the highest total returns over all other treatments. Sorghum + Groundnut treatment stood second in case of grain yield. The lowest return was received from Sorghum + Sesamum treatment.

However, at Agricultural Research Station Digraj highest grain yield was obtained from Sorghum alone and gave the highest total returns (Rs. 4052/ ha) and the lowest was obtained from Sorghum + Soybean (Rs. 1937.48/ha).

At both the locations on an average Sorgum alone and Sorghum + Redgram have given more or less same monetary returns. Intercropping trial was also conducted at Agricultural Research Station Karad but due to water stagnation germination was affected. The yields are below average due to low plant density, heavy infestation of pest so trial is treated as vatiated.

During the last year intercropping trial was conducted at Agricultural Research Station Jalgaon, Digraj and Karad. At Jalgaon and Digraj Sorghum + Green gram treatment (3435 and 6840 Rs/ha) gave the highest total returns and Sorghum + Sunflower (2579 and 2089 Rs/ha) produced lowest outturns /ha. However, at Karad Sorghum alone (5379 Rs/ha) produced the highest total returns and lowest was of Sorghum + Castor.

2(a) Title : Uniform Agronomic trial (Agril. Research Station, Digraj)

(b) Object : To study the effect of nitrogen on the yield of different Sorghum hybrids and varieties.

(c) General information:

i) Year of the experiment: First

ii) Treatments : 20

a) Entries : 5

E_1 CSH-5
E_2 CSH-6
E_3 CS-3541
E_4 168
E_5 CSH-1

b) Levels of Nitrogn : 4

N_0 - 0 kg N/ha
N_1 - 40 kg N/ha
N_2 - 80 kg N/ha
N_3 - 120 kg N/ha

iii) Design : R.B.D.

iv) Replications : Four

v) Plot size :

Gross : 10.0 m x 3.6 m. = 36.0 m^2

Net : 8.0 m x 2.7 m = 21.6 m^2

vi) Manures and fertilizers.

12.5 cartload of F.Y.M./ha. and nitrogen as per the treatments + 60 kg P_2O_5 + 40 kg K_2O/ha.

(d) Results - Table 12.

Table 12. Grain yield q/ha.

E/N	Levels of Nitrogen				
	0	40	80	120	Mean
E_1-(CSH-5)	20.64	25.18	24.44	23.24	23.38
E_2-(CSH-6)	22.87	22.31	23.10	25.23	23.38
E_3-(CS-3541)	21.20	25.18	27.73	23.93	24.51
E_4-(168)	22.59	25.50	25.50	28.88	25.62
E_5-(CSH-1)	10.51	9.49	9.03	12.91	10.49
Mean	19.56	21.53	21.96	22.84	

	S.E. ± q/ha	C.D. at 5% q/ha.
Entries :	2.81	7.80
Nitrogen:	2.53	-
E x N :	5.64	-

Table 13. Fodder yield q/ha.

E/N	Levels of Nitrogen				
	0	40	80	120	Mean
E_1-(CSH-5)	26.02	26.62	37.04	28.94	29.66
E_2-(CSH-6)	25.46	23.15	35.88	38.75	30.81
E_3-(CS-3541)	33.56	39.35	37.04	34.72	36.17
E_4-(168)	39.35	43.38	28.33	38.19	37.31
E_5-(CSH-1)	15.60	16.20	19.07	19.07	17.49
Mean	28.00	29.74	31.47	31.93	

	S.E. ± q/ha	C.D. at 5% q/ha.
Entries :	1.22	3.38
Nitrogen:	1.03	2.87
E x N :	2.40	6.66

CONCLUSIONS:

Grain yield: The grain yield due to varieties differ significantly. The entries CSH-5, CSH-6, CS-3541 and 168 produced significantly more grain yield than CSH-1. However they were on par among themselves.

The nitrogen levels were found to be non significant. Last year this trial was conducted at Agril. Research Station Jalgaon where linear response for different doses 'N' was observed. This year the trial at Agril. Research Station Digraj was not properly conducted as plant population was not uniform and was hardly 60.- 70% of the optimum. There was also heavy incidence of midge which has also affected the yield. The trial would be repeated this year at Digraj & Karad.

Fodder yield: The highest fodder yield was produced by variety 168 (37.31 q/ha) followed by CS-3541 (36.17 q/ha) and were significantly superior than the rest. Hybrid CSH-5 and CSH-6 were found to be superior over CSH-1.

Nitrogen levels of 80 and 120 kg/ha produced significantly more fodder yield than control. However 0 and 40 kg N/ha were on par.

The interaction between entries x nitrogen was found to be significant.

SUMMARY

1) Intercropping studies:-

The trial was conducted at Agril. Research Station, Jalgaon and Digraj on an average Sorghum alone and Sorghum + Red gram have given more or less same monetary returns. During the last year this trial was conducted at Agril. Research Station, Jalgaon,Digraj and Karad. At Jalgaon and Digraj Sorghum + Green gram treatment (3435 and 6840 Rs./ha) gave the highest total returns and Sorghum + Sunflower (2579 and 2089 Rs./ha) produced lowest out turns/ha. However, at Karad Sorghum alone (5379 Rs/ha.) produced the highest total returns and lowest was of Sorghum + castor.

2) Levels of Nitrogen x Germplasm:

Trial was conducted at Agril. Research Station, Digraj only. The hybrids CSH-5, CSH-6 and varieties CS-3541, 168 produced 23.38 23.38 and 24.51, 25.62 q/ha grain yield respectively and were significantly superior than the hybrid CSH-1.

The grain yield of entries did not differ significantly due to levels of nitrogen.

During the last year this trial was conducted at Agril. Research Station Jalgaon where CSH-5 and CSH-6 proved their superiority over varieties CS-3541, 168 and 604. The yield of jowar varieties and hybrids showed linear increase with the increase in dose of nitrogen upto 120 kg/ha.

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iii) Entemology- kharif

1) a) Title : To study the effect of Carbofuran alongwith Azotobacter culture on the yield of Sorghum.

b) Object : To find out antogonistic or synergistic effect of carbofuran on the growth of Azotobacter.

c) Design :R.B.D. with 5 replications.

d) Sowing date :3-7-1976.

e) Hybrid :CSH-1.

f)Plot size : : 6 m. x 4m.

g) Harvesting date : 10-10-1976.

h) Results : Presented in table-14.

Table-14

Sr. No.	Treatment	Average percentage dead hearts due to shoot fly	Yield of grain kg/ha	Yield of fodder kg/ha
1.	5% Carbofuran	4.92	7416.54	8916.50
2.	5% Carbofuran + Azotobacter	6.06	7266.55	7958.20
3.	Azotobacter alone	26.33	6858.22	7416.54
4.	Control	59.76	4566.59	6583.22
	S.E.	3.62	295.82	337.49
	C.D. at 5%	11.12	908.31	1033.31

The results obtained in this experiment showed that the average percentage dead hearts due to shoot fly in the treatment where only 5% carbofuran was used was 4-92 as against 6.06 and 26.33 in the treatment where carbofuran + Azptobacter alone were used No. significant difference existed amoungst the two treatments viz., carbofuran alone and carbofuran + Azotobacter. While significant difference existed between these two treatments and Azotobacter alone and control. Likewise this trend was also observed in the yields of grain and fodder.

The results thees indicated that carbofuran is compatible with Azotobacter.

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The samples of treatments of 5 replications were mixed together and th Azotobacter count was taken accordingly.

Table - 15.

Sr. No.	Treatments	1st week	2nd week	3rd week	4th week
1.	Azotobacter	37	41	44	49
2.	Azotobacter + Carbofuran	35	40	43	48
3.	Carbofuran	21	22	25	31
4.	Control	22	20	27	37

Thus it indicates that carbofuran does not inhibit the growth of Azotobacter:

This trial was also conducted at Agril. Research Station, Digraj : Jalgaon. At both the places yield differences in case of grain and fodde were non-significant however the data is presented in table No. 16

Effect of carbofuran along with Azotobacter culture on yield of jowar at Agril. Research StationJalgaon & Digraj.

Table -16.

Sr.No.	Treatments	Jalgaon Grain kg/ha	Jalgaon Fodder kg/ha	Digraj Grain kg/ha	Digraj Fodd kg/h
1.	Azotobacter	1458	10208	1315	2685
2.	Carbofuran	1254	11208	1856	3103
3.	Carbo furan + Azotobacter	1121	10875	1643	2963
4.	Untreated	1403	11333	1264	2268

The differences in grain yield are not significant mostly due to low plant population at harvest. This experiment would be repeated next year.

2) a) Title — Insecticidal trial against Sorghum Shoot fly.

b) Object — To find out the most effective insectic... against the pest.

d) Plot size — 4.5 m. x 5 m.

e) Sowing date — 17-7-1976.

f) Hybrid — CSH-5.

g) Results — Presented in table- 17.

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Table-17.

Sr. No.	Treatments	% age ~~decline~~ pest incidence	Arcsin values	Yield of grain in kg/ha.	Yield of fodder in kg/ha.
I.	Seed treatment				
1.	5% Carbofuran	19.45	20.79	7848.81	10593.33
II.	Soil Application				
2.	0.5 kg aldicarb/ha	25.03	28.13	7537.70	10293.23
3.	0.5 kg phorate/ha.	26.21	28.79	7437.70	10146.56
4.	1.0 kg aldicarb/ha	26.66	31.11	7204.70	9924.34
III.	Sprays				
5.	0.05 % dursban	28.14	32.01	7012.15	8888.80
6.	0.05 % phosalone	28.24	32.08	6622.15	8666.58
7.	0.05 % dimethoate	28.28	32.14	6857.70	8716.28
8.	0.2 % sevimol	29.37	32.83	6413.25	8666.58
9.	0.05 % fenitrothion	29.73	33.62	6146.60	8815.47
10.	0.2 % BHC.	31.07	33.89	6046.60	8071.03
11.	0.2 % D.D.T.	32.07	34.51	5226.61	5924.38
IV.	Dust				
12.	10 % B.H.C.	36.62	38.26	6026.60	8015.47
13.	Control	43.57	44.32	4959.95	7848.81
	S.E.		2.40	284.60	270.99
	C.D.		6.97	773.32	888.88

Analysis of the data indicated that the seed treatment with 5 percent carbofuran was the most promising & significantly superior to res of the treatments except the treatments with soil application of 0.5 kg. aldicarb and 0.5 kg. phorate. No. significant difference however, was noticed amongst the rest of the treatments. 10% BHC dust was the least effective.

Highest yield of grain (7848.81 kg/ha) and fodder (10593.33 k was obtained in treatment with 5% carbofuran which was significantly superior to rest of the treatments except 0.5 kg aldicarb, phorate and 1.0 kg aldicarb/ha.

3. Screeing of some lines for resistence/tolerance to shootfly.

Non replicated three rows of each entry was sown on 20 th July 1976. The data is presented in table No. 18.

Set I.

Table No. 18.

Sr. No.	Entry	Percentage infestation	Sr. No.	Entry	Percentage infestation
1	I.S. 5604	28.57	11.	P.O.P 110	62.50
2.	I.S. 1004	40.00	12.	E- 303	66.00
3.	I.S. 5383	40.00	13.	I.S. 4663	69.20
4.	I.S. 2123	41.66	14.	I.S. 2912	70.00
5.	I.S. 1082	42.85	15.	I.S. 4501	71.00
6.	E-302 3020	50.00	16.	I.S. 2660	71.00
7.	E.N 3337-4	54.54	17.	I.S. 4518	72.72
8.	I.S. 2663	58.33	18.	I.S. 4644	75.00
9.	P.O.P. 111	58.82	19.	I.S. 12664	91.66
10.	I.S. 3962	60.52	20.	I.S. 2302	100.00

Set No. 2

Table No. 19.

Sr. No.	Entry	Percentage infestation	Sr. No.	Entry	Percentage infestation
1.	IS 5604	4.28	13.	FR 198-1	63.23
2.	IS 5490	11.11	14.	FR-167	65.21
3.	FR-196-1	21.33	15.	EC-92793	65.38
4.	IS 5469	23.00	16.	FR 186-1	68.88
5.	IS 5801	27.00	17.	FR 203	68.95
6.	IS 8315	28.33	18.	EC 92794	70.00
7.	FR 129-1	48.33	19.	FR 493	71.75
8.	FR 164-1	50.00	20.	1258 B	72.72
9.	36 B	56.00	21.	IS 9327	73.80
10.	1202 B	56.66	22.	FR-194	75.00
11.	FR-173	60.00	23.	IS 9333	76.19
12.	IS 9530	62.22	24.	EC 92792	77.77

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Table-20.

Set III

Sr. No.	Entry	Percentage infestation	Sr. No.	Entry	Percentage infestation
1.	MS-7	46.30	7	IS 6297	71.42
2.	IS 10939	53.42	8.	IS 10404	79.31
3.	IS 7248	58.18	9.	ET-2039	80.00
4.	RY 49	62.10	10.	IS 10244	86.53
5.	IS 8272	60.39	11.	IS 10927	88.33
6.	MS-3	62.10	12.	IS 7502-C	88.88
7.	IS 6297				

The data shows that the entries from set No. I, IS 5604, 1004, 5383 and IS-2123 are some what tolerant to shootfly. In set No.2 IS-5604, IS-5490, FR 196-1, IS 5469, 5801 and IS 8315 are promising. While in set No. 3 MS 7, IS 10939 have some tolerance to shoot fly.

4. Screening of some lines for resistance to midge fly.

At central campus following entries were tested to their reaction to midge flies. The entries were sown on 21-7-76. The year heads were exposed to 20 midges for laying eggs. The data is presented in table No. 21.

Sr. No.	Entry	Rahuri % Grain affected	A.R.S. Digraj % grain filled	A.V. No. Midge fl on one e head
1.	SC 228	9.12	-	-
2.	S girl. MR 1	13.20	44.59	9.80
3.	SC-120	15.20	12.82	23.20
4.	SC-239	19.12	-	-
5.	SC-423	20.11	39.37	12.20
6.	SC-108	32.33	-	-
7.	SC-173	39.43	44.58	12.40
8.	Tam 2566	42.26	-	-
9.	CSH-1	88.33	24.03	34.20

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The data indicate that the lines viz SC-228,SC-120, S. Girl MR-1 SC-239 and SC-423 are resistant to midge fly. This trend was observed at centrel campus. While at Digraj SC-173, S. Gril MR-1 and SC-423 have shown some tolernce to midge fly.

5.

a) Co-ordinated Trial No. 8 : Pest incidence in ratoon crop.

b) Object : To determine the relative damage due to major pests on the main and ratoon and to estimate the losses caused pest.

c) Design : R.B.D. with four replications

d) Plot size : 4.5 m x 3 m.

e) Hybrid : CSH-5

f) Sowing date : 29-6-1976

g) Date of harvest of main and ratoon crops : 14-10-1976 and 4-2-1977

h) Results : Presented in Table 22

Table- 22 (a) Damage due to shootfly and stem borer and yields of grain and fodder.

(Main crop)

Sr. No.	Shootfly Av.% age dead hearts,	Arcsin values	Stem borer Av. % age dead hearts	Arcsin values	Yield in kg/ha Grain	Fodder
Protected						
1.	3.09	10.14	21.25	27.42	9488.87	11111.10
2.	3.17	10.31	17.50	24.73	9370.36	11511.47
3.	4.08	11.68	13.75	21.64	9051.84	11851.84
4.	3.29	10.47	17.50	24.73	9550.36	11203.59
Unpretected						
5.	26.89	31.24	36.25	36.99	6837.03	7129.62
6.	28.53	32.27	35.00	36.27	6037.03	7037.03
7.	34.92	36.21	33.71	35.49	5859.25	7222.21
8.	33.46	35.37	32.25	34.27	6207.40	5918.51
	S.E.	1.64		4.17	296.29	414,81
	C.D.	4.80		12.22	866.66	1216.29

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Table 22 (b)

Treatment	Av.% age dead hearts due to shoot fly	Av. % are dead hearts. due to stem borer	Av. grain yield in kg/ha	Av. fodder yield in kg/ha.	Loss due to pe in kg/ha Grain	Fodder
Protected	3.40	17.50	9370.35	11419.5[illegible]	3135.18	4592.65
Unprotected	30.95	34.30	6235.17	6826.84		

The data indicated that the damage caused by shoot fly and stem borer was relatively more in the unprotected plots than in the protected ones. Likewise yields obtained in the protected plots were higher than in the unprotected plots. The losses observed due to shootfly and stem borer was to the extent of 3135.18 kg/ha and 4592.65 kg/ha of grain and fodder respectively for the main crop.

Summary

The experiment conducted at Central Campus shows that the carbofuran does not inhibit the growth of Azotobacter. Azotobacter + Carbofuran and carbofuran alone did not differ significantly. While significant difference existed between these two treatments and Azotobacter alone and control.

In case of chemical control of shoot fly experiment it was revealed that 5% carbofuran was the most promising and significuntly superior to rest of treatments except treatment with soil application of 0.5 kg aldicarb and 0.5 kg phorate.

The following lines were observed to be some what tolerant to shoot fly and midge fly.

Shoot fly tolerent :

IS 5604, 1004, 5383, 2123, 5490, FR 196-1, IS 5469, 8315, and IS 5801.

Midge fly tolerent :

SC 228, SC 120, S Girl MR-1, SC-239 and SC 423.

In case of Main crop of Ratoon the loss due to shootfly and stem borer was to the extent of 3135.18 kg/ha and 4592.0 kg/ha of grain and fodder respectively.

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PART-II.

(Proposed work for 1977-78)

KHARIF JOWAR:

A) Plant breeding

I) Sorghum Improvement Project, Rahuri

1) Advanced Sorghum hybrid Trial
2) Advanced Sorghum varietal Trial

II Agril. Research station Jalgaon

1) Advanced Sorghum hybrid trial
2) Preliminary Sorghum hybrid Trial
3) Large Scale Sorghum hybrid Trial
4) Preliminary Sorghum varietal Trial-I
5) Preliminary Sorghum varietal Trial II
6) Large Scale Sorghum Varietal Trial
7) Advanced Sorghum varietal Trial
8) Parental line Trial.

III) Agril. Research Station Dhule:

1) Advanced Sorghum hybrid Trial.
2) Advanced Sorghum varietal Trial.

IV) Agril. Research Station Digraj:

1) Advanced Sorghum hybrid Trial.
2) Advanced Sorghum varietal Trial.
3) Preliminary Sorghum varietal Trial.-I
4) Preliminary Sorghum Varietal Trial-II.
5) Preliminary Sorghum hybrid Trial
6) Parental line Trial.
7) Large scale varietal Trial.
8) Large scale hybrid Trial.

V) Agril. Research Station Karad:

1) Advanced Sorghum hybrid Trial.
2) Advanced Sorghum hybrid Trial.
3) Preliminary Sorghum hybrid Trial.
4) Large scale Sorghum hybrid Trial.
5) Preliminary Sorghum varietal Trial-I
6) Preliminary Sorghum Varietal Trial-II.
7) Large scale Sorghum varietal Trial
8) Parental line Trial.

Hybridization programme would be taken to improve present high yielding varieties and parents of hybrids in respect of shootfly, midgefly, grain would tolerance/resistance and grain quality improvement.

VI. Agril. Research Station Gadhinglaj:

1) Advanced Sorghum hybrid Trial.
2) Advanced Sorghum Varietal Trial.

B) Agronomy

a) Experiments to be continued	Location
1) To study the effect of nitrogen levels on the grain yield of different promising genotypes.	Agril. Res. Station Jalgaon, Digraj & Karad.
2) Inter cropping studies	-do-

b) New proposed experiments to be conducted during the year 1977-78

I) Name of the experiment: Date of sowing x plant population on Sorghum.

ii) Location: Agril. Research Station Karad and Professor of Agronomy Agril. College Dhule.

iii) Treatments: 40

a) Dates of sowing : 5 (at the interval of 10 days)

b) Population : 4

P_1-90,000/ha P_2-1,35,000/ha

P_3- 1,80,000/ha P_4-2,25,000/ha.

c) Entries: 2

E_1- CSH-5, E_2- CS-3541

iv) Design: Scattered block design.

v) Replications : 4

vi) Plot size:

Gross 12.0 m x 5.4 m = 64.8 m^2

Net 10.0 m x 3.6 m = 36.0 m^2

II) i) Title : Rates of nitrogen x Entries.

ii) Location : Agril. College Dhule ~~and Agril. Research Station Digraj.~~

iii) Treatments : 16

.....42/-

a) Levels of nitrogen : 4

N_0 - 0 kg N/ha N_1 - 40 kg N/ha

N_2 - 80 kg N/ha N_3 - 120 kg N/ha

b) Entries : 4

E_1- CSH-5 E_2- CSH-6

E_3- CS-3541 E_4- 148/168

iv) Design : R.B.D.

v) Replication : 4

vi) Plot size:

Gross : 10.0 m x 3.6 m = 36.0 m^2

Net : 8.0 m x 2.7 m = 21.6 m^2

III) i) Title : Ratoon experiment on CSH-5

ii) Location : Agril. Research Station Jalgaon.

iii) Treatments : 18

a) Main treatments : 3 (Harvesting)

H_1- 15 days before due date of harvest of main crop. (35% moisture in grain)

H_2- 7 days before due date of harvest.

H_3- Harvesting of main crop at due date of maturity.

b) Sub-treatments : 3 (Nitrogen levels) :

N_0- 0 kg N/ha.

N_1- 40 kg N/ha

N_2- 80 kg N/ha

c) Sub-sub-treatments : 2 (tillers)

T_1 - 2 tillers per shoot

T_2 - 3 tillers per shoot

iv) Design: Split plot design

v) Replications : 3

vi) Plot size:

Gross : 9.0 m x 3.6 m = 32.4 m^2

Sub plot : 4.5 m x 3.6 m = 16.2 m^2

Net : 3.9 m x 2.7 m = 10.53 m^2

IV) i) Title Trial on weed control of Sorghum

ii) Location : Prof. of Agronomy College of Agriculture Dhule and Kolhapur.

.....43/-

V) i) Title : Intercropping studies on jowar CSH-5, groundnut as intercrop.

ii) Location: Agril. Research Station Digraj.

iii) Treatments : 12

a) Main treatments : 2

i) Intercrop

ii) No intercrop.

b) Sub-treatments: 3 (Spacing)

Sorghum with i) 60 x 15 cm ii) 60 x 10 cm

iii) 60x 7.5 cm

c) Groundnut as intercrop : (Varieties) : 2

i) SB XI ii) TMV-10

iv) Design: Split plot design.

v) Replications : 4

vi) Plot size :

Gross : 5.40 m x 6.00 m

Net : 4.20 m x 3.60 m

vii) Fertilization :

100 kg N + 80 kg P_2O_5 + 60 kg K_2O/ha.

C) Entomology

Sorghum Improvement Project, Rahuri

1) Trials given by Technical Project leader.

2) Insecticidal trial/for control of shoot fly as discussed in special meeting on 8th December 1976.

3) Screening of Germplasms for shootfly and midgefly.

.....44/-

B) RABI JOWAR.

Part-I.

i) Plant breeding

The Rabi Sorghum research work was carried out at Sorghum Improve Project, central campus Rahuri and April. Research Station Mohol.

1) Advanced Sorghum Varietal hybrid trial:

This trial was conducted at Rahuri.

a) Object : To see the performance of new varieties & hybrids.

b) Year of commencement : 1976-77.

c) Design : R.B.D.

d) Plot size: Gross : 8.1 x 2.7 m.

Net : 7.5 x 1.8 m.

e) Replications : Three.

f) Results : Table -23.

CONCLUSIONS:

Rahuri:

The results are significant. The released hybrids CSH-7 R (516 ha) yielded significantly superior over other entries. CSH-7 R is significantly superior to M-3541 (4019 kg/ha).

M. 35-1 has given significantly highest fodder yield over other entires.

Table-23. Grain and fodder yield Height days to 50% flowering & 1000 grain weight.

Sr. No.	Entry	Yield kg/ha — Grain	Fodder	Days to 50 % flowering	Plant height CMS.	1000 grain weight.
1.	SPV-86	3785	4200	64	128	29
2.	SPV-139	2904	4200	64	96	30
3.	SPV-140	2830	2222	64	85	25
4.	SPV-102	2504	3948	62	111	33
5.	SPV-115	3607	2963	60	80	30
6.	SPV-41	3052	3704	68	111	25
7.	SPV-42	3570	6667	68	129	28
8.	SPV-43	3044	5185	69	134	24
9.	SPV-50	3311	4444	70	117	32
10.	SPV-51	2252	3948	74	118	30
11.	SPV-80	2941	3704	61	103	25
12.	CSV-7 R	2889	2222	61	85	25
13.	SPH-33	3274	4200	59	90	30
14.	SPH-47	3733	2467	57	89	25
15.	SPH-49	3496	2719	56	103	33
16.	SPH-62	3519	2963	56	90	25
20.	SPH-67-1	3459	2467	59	73	25
21.	SPH-67-2	3215	2719	58	75	26
22.	CSH-1	3504	2467	57	78	25
23.	CSH-5	3348	2719	62	108	30
24.	CSH-6	2059	2222	54	84	30
25.	CSH-7 R	5163	2719	56	85	29
26.	CSH-8 R	4622	3948	57	85	33
30.	M-35-1	4015	9133	68	197	33
	S.E. kg/ha	283	555			
	C.D. kg/ha	806	1582			

2) Preliminary Sorghum Varietal trial-I

This trial was conducted at Rahuri.

a) Object : To see the performance of newly developed varieties in rabi season.

b) Year of Commencement: 1976-77. c) Design : R.B.D.

d) Plot size: Gross : 8.1 x 2.7 m. e) Replications : Three
Net : 7.5 x 1.8 m.

f) Results : Table -24.

.....46/-

Table-24. Grain & fodder yield Height days to 50% flowering & 1000 gra

Sr. No.	Entry	Yield kg/ha		Days to 50 % flowering	Plant height cms.	1000 weig
		Grain	Fodder			
1.	SPV-81	2222	2593	56	68	20
2.	SPV-95	1244	8143	76	106	25
3.	SPV-122	2593	2719	63	85	22
4.	SPV-123	2496	4689	65	75	23
5.	SPV-124	2807	5170	71	110	33
6.	SPV-131	2615	3948	63	102	25
7.	SPV-137	3111	4689	61	147	27
8.	SPV-138	2570	3459	60	105	20
9.	SPV-141	3393	6667	64	135	25
10.	SPV-143	2874	3207	61	101	27
11.	SPV-144	3296	6911	61	172	30
12.	SPV-145	2148	3704	65	129	30
13.	1202 A x 285	4681	4200	46	130	28
14.	1258 A x 285	2867	3207	50	118	29
15.	SPV-146	1867	4200	75	93	25
16.	SPV-147	2681	4200	67	98	25
17.	SPV-148	1874	6422	74	99	27
18.	SPV-149	2170	7652	69	120	25
19.	SPV-150	2459	5430	67	93	32
20.	SPV-155	1726	7163	71	131	30
21.	SPV-153	2652	3948	64	117	25
22.	SPV-154	3244	3207	62	103	25
23.	SPH-115	3089	2719	57	112	29
24.	CSH-7 R	4533	3704	59	104	28
25.	CSH-8 R	5259	3467	58	93	30
26.	M-35-1	3422	8393	62	193	33
	S.E. kg/ha	346	1591			
	C.D. kg/ha	983	4524			

CONCLUSIONS:

Rahuri: The released hybrid CSH-8 R (5259 kg/ha) gave significantly super yield over other entries and is on par with 1202 A x 285 (4681 kg/ha) and CSH-7 R.(4533 kg/ha)

The hybrid 1202 A x 285 posses tolerance to shootfly, good cob shape, grain size flowers in about 46-48 days and matures in 95-100 days. It produces tillers and tillers mature simultaneous.

The M.35-1 has given highest fodder yield.

3) Preliminary Sorghum varietal trial-II.

This trial was conducted at Rahuri and Mohol.

a) Object : The promising derivatives obtained from the cross R-24 x R-16 (Sister lines of SPV-86) were tested for their yield performance in comparision with R-16, CSH-7, CSH-8 and M-35-1.

b) Year of commencement: 1976-77.

c) Design : R.B.D.

d) Plot size.: Gross: 8.1 x 2.7 m. 9.[illegible] x 2.[illegible] m.
Net : 7.5 x 1.8 m. [illegible]

e) Replications : Three

f) Results : Table.25.

CONCLUSIONS:

Rahuri: Though the results are significant none of the entry yielded significantly superior to M 35-1. The hybrid CSH-8 R has given highest grain yield of 3274 kg/ha followed by the new entry 91-1 giving 3044 kg/ha grain yield.

M.35-1 has given highest fodder yield.

Mohol : The differances in the grain yield due to varieties were non-signi ant. CSH-8 the standard check recorded the highest yield of 2200 kg/ha. Among the varieties 91-5 was the best and recorded 208 kg/ha. grain yield. This was closely followed by 91-8, 91-6 and 91-7. All these lines were possessed desired plant type and grain characteristics. M-35-1 gave highest fodder yield of 2466 kg/h

Summary: The hybrid CSH-8 R performed well at both the locations giving aver yield of 2737 kg/ha. The new varieties 91-4 (2515 kg/ha) and 91-5 (2407 kg/ha) also performed well at both the locations.

....,...48/-

Table-25. Grain and fodder yield days to 50% flowering plant height and 1000 grain weight.

Sr. No.	Entry	Grain yield kg/ha			Fodder yield kg/ha			Days to 50% bloom			Plant height cms.			1000 grain weight		
		Rahuri	Mohol	Mean	Rahuri	Mohol	Mean	Rahuri	Mohol	Mean	Rahuri	Mohol	Mean	Rahuri	Mohol	Mean
1.	91-1	2667	1563	2115	3459	1607	2533	62	64	63	133	112	123	22	28.0	25.0
2.	91-2	2393	1467	1930	2963	1607	2285	65	65	65	122	109	121	20	24.6	22.3
3.	91-3	2370	1785	2078	3948	1851	2900	65	65	65	106	107	107	25	24.6	24.8
4.	91-4	3044	1785	2415	3459	2096	2778	64	64	64	122	111	117	20	27.6	23.8
5.	91-5	2733	2081	2407	2222	2222	2222	62	63	63	124	116	120	21	28.2	24.6
6.	91-6	2467	1867	2167	2719	1851	2285	61	62	62	107	113	110	28	25.7	26.8
7.	91-7	2385	1867	2126	3207	1851	2529	63	63	63	133	109	121	25	26.9	25.9
8.	91-8	2311	1904	2108	3207	1977	2592	62	62	62	105	116	111	25	31.5	28.2
9.	CSV-7 R	2089	1570	1830	1978	1725	1852	58	68	63	81	84	83	25	30.4	27.7
10.	CSH-7 R	2830	1444	2137	2963	1607	2285	59	61	60	87	97	92	29	25.0	27.0
11.	CSH-8 R	3274	2200	2737	2719	2222	2471	58	59	59	81	102	92	30	29.1	29.5
12.	M-35-1	2667	1615	2141	6052	2466	4259	68	75	72	170	137	154	33	31.4	32.2
13.	Hy-66EB	2515	-	-	2593	-	-	57	-	-	128	-	-	20	-	-
	S.E. kg/ha	344	252		271	266										
	C.D.				---	---										

.....49/-

4) Parental line trial.

This trial was conducted at Rahuri and Mohol.

a) Object : To make a comparetivee study of the yield of B lines and restorers.

b) Year of commencement : 1976-77.

c) Design : R.B.D.

d) Plot size : Gross : 8.1 x 2.7 m.
Net 7.5 x 1.8 m.

e) Replications : Three

f) Results : Table 26.

CONCLUSIONS:

Rahuri:

The results are stastistiealy significant. 3660 B yielded significantly superior over other entries and is on par with CK 60 B and 1202 B.

Mohol:

There was a significant differences in the grain yields due to various entries 1202 B produced significantly highest yield over all entries except CK 60 B and 168. Among B lines 1202 B and CK 60 B were promising. Among pollinators CSV-5 (168) recorded the highest yield of 963 kg/ha.

Summary:

The average performance of 1202 B and CK 60 B at both the locations is good. 1202 B flowers in 56 days and is having madium /lustrous bold, / grains with tolerance to shootfly.

.....50/-

4Table 26 Grain and fodder yield days to 50% bloom Plant height and 1000 grain weight.

Sr. No.	Entry	Grain yield kg/ha			Fodder yield kg/ha			Days to 50% flowering			Plant height			10000	
		Rahuri	Mohol	Mean	Rahuri	Mohol	Mean	Rahuri	Mohol	Mean	Rahuri	Mohol	Mean	Rahuri	Mohol
1.	IS 84	2407	807	1607	3207	1059	2133	60	62	61	86	85	86	29	24.5
2.	CK-60 B	3459	1148	2304	3207	1111	2159	56	59	58	90	86	88	20	23.1
3.	30 B	2837	733	1785	3207	1355	2281	59	62	61	91	80	86	25	29.3
4.	296 B	2948	748	1848	3704	1111	2408	63	66	65	89	86	88	20	24.4
5.	1202 B	3348	1185	2267	2467	1355	1911	55	57	56	90	85	88	22	25.1
6.	2077 B	1770	400	1085	4444	985	2715	71	72	72	87	86	87	25	18.7
7.	2219 B	2519	681	1600	2963	985	1974	64	58	61	81	85	83	25	19.0
8.	2947 B	2311	326	1319	2222	1237	1730	65	68	69	92	89	91	25	23.6
9.	3660 B	3630	711	2171	4689	1355	3022	60	63	62	112	85	99	22	20.0
10.	168	2552	963	1808	3459	1355	2407	60	62	61	85	81	83	28	2022
11.	370	2467	674	1571	2963	1237	2100	66	60	63	774	93	99	20	20.9
12.	P.D. 3 -1-11	2333	659	1496	3459	985	2222	62	62	62	78	82	81	28	27.8
13.	CS-3541	2704	607	1656	3207	985	2096	66	62	64	97	86	88	25	23.7
14.	CS3541(R-F)	2852	207	1530	3948	1111	2530	70	75	73	93	86	92	20	22.3
15.	CS-3541(R-12)	2504	119	1312	4941	1481	3211	71	76	74	784	95	87	22	21.5
16.	CS-3541 (R-13)	2644	289	1467	5430	1481	3456	69	76	73	104	101	103	23	20.1
	S.E.kg/ha	172	141		402	155									
	C.D. kg/ha	495	407		1162	N.S.									

5) Large scale sorghum hybrid trial:

This trial was conducted at Rahuri and Mohol.

a) Object : To evaluate the yield performance of newly produced Sorghum hybrids under rainfed conditions.

b) Year of commencement: 1976-77.

c) Design : R.B.D.

d) Plot size Gross : 8.1 x 2.7 m.

Net : 7.5 x 1.8 m.

e) Replications : Three.

f) Results : Table 27.

Conclusions:

Rahuri: The results are statistically significant. The released hybrids CSH-7 R (2948 kg/ha) and CSH-8 R (2948 kg/ha) and new hybrid 4 RA x Hy 66 (2926 kg/ha) are on par with each other giving more yield than the other entries.

Mohol:

The yield differences amongst the hybrids were stastically nonsignificant. However the hybrid 4 RA x Hy 66 produced the highest yield of 1274 kg/ha. Among others 1 R (114) A x IS-2930-75, 1586 A x 15-2930-75, 4 RA x IS 2930-75 appeared to be promising.

Summary:

The average performance of 4 RA x Hy 66 (2100 kg/ha) at both the location is satistactory. This hybrid willbe tested in the Co-ordinated trials of rabi 1977.

.....52/-

Table 27 Grain and fodder yield days to 50% flowering plant height and 1000 grain weight.

Sr. No.	Entry	Grain yield kg/ha Rahuri	Mohol	% increase over check	Mean	Fodder yield kg/ha Rahuri	Mohol	Mean	Days to 50% bloom Rahuri	Mohol	Mean	Plant height cms. Rahuri	Mohol	Mean	1000 grain weight Rahuri	Mohol	Mean
1.	4 RA x Hy 66	2926	1274	70.3	2100	2663	1237	1950	56	60	58	114	116	115	30	28.2	29.1
2.	4 RA x IS-2930-75	2259	800	6.9	1530	2593	867	1730	52	58	55	105	105	105	30	31.0	30.5
3.	4 RA x IS-532	1556	370	-	963	1237	489	863	56	61	59	77	89	83	30	29.2	29.6
4.	4 RA x IS-3024	2593	533	-	1563	1481	615	1048	54	61	58	81	93	87	30	25.6	27.8
5.	4 RA x CS-3541	2111	778	4.0	1445	1481	985	1233	51	58	55	94	105	100	20	24.8	22.4
6.	1036 A Hy.66	2393	600	-	1497	2963	741	1852	59	61	60	103	93	98	20	18.8	19.4
7.	1586 A x IS.2930 -75	2459	837	11.9	1648	1978	867	1423	52	59	56	81	100	91	22	23.1	22.5
8.	1586 A x IS.3924	2326	511	-	1419	1356	489	923	57	64	61	83	80	82	20	20.4	20.2
9.	1 R (114) x IS. 2930-75	2333	852	13.9	1593	1726	867	1297	51	60	56	86	105	96	25	29.5	27.2
10.	15 R (904) A x IS.2930-75	2052	385	-	1219	1726	489	1108	53	60	57	84	88	86	30	27.7	28.8
11.	1587 A x IS 3924	1711	481	~~489~~	1096	1607	489	1048	56	63	60	80	88	84	25	20.0	22.5
12.	19RA x IS-3924	2356	696	-	1526	1978	867	1423	57	64	61	90	98	94	25	28.0	26.5
13.	CSH-1	2348	859	14.8	1604	1726	867	1297	57	68	63	79	92	86	25	21.2	23.1
14.	CSH-7 R	2948	741	-	1845	2467	867	1667	59	65	62	97	91	94	20	27.7	23.8
15.	CSH-8 R	2948	919	22.9	1934	2719	985	1852	58	63	61	92	79	86	30	31.3	30.6
16.	M.35-1	2319	748	~~4~~-	1534	5556	985	3271	70	77	74	135	123	128	30	29.6	29.8
	S.E.kg/ha	304	191	-		363	162										
	C.D.kg/ha	878	N.S.			1047	NS										

53/-

6) SORGHUM YIELD TRIALS AGRIL. RESEARCH STATION MOHOL

a) Title : Preliminary sorghum hybrid trial.

a) Object : To evaluate the yield performance of newly produced sorghum hybrid under rainfed conditions.

Eighteen new hybrid combinations produced at Mohol were included in this trial. CSH-7, CHS-7, CSH-8 and M. 35-1 were used as check.

b) Year of commencement : 1976-1977
Entries : 18+4 = 22
c) Design : R.B.D.
d) Replications : Three
e) Plot size: Gross : 6.90 x 1.80 m.
Net : 6.30 x 1.80 m.
f) Results : Table 28

Sr. No.	Hybrid	Yield kg/ha. Grain	% Increase Over check	Fodder yield kg/ha.	Height cm.	Days to 50% flowering	1000 grain weight
1.	4 RAx PD-12-1	1720	93.9	1767	122.4	57	28.9
2.	4 RAx PD-12-2	1384	56.8	1464	119.7	57	26.9
3.	4 RAx 148	1146	29.2	1323	118.1	58	25.1
4.	17RAxPD-12-2	1252	41.2	13 23	128.2	57	26.6
5.	1202Ax PD-12-2	1041	17.4	1173	104.3	58	27.8
6.	1202AxIS-532	1146	29.2	1173	91.1	55	25.0
7.	1258Ax FR-129	1217	37.2	1614	119.8	63	23.2
8.	1568Ax PD-12-2	1102	24.2	16 14	119.7	61	29.3
9.	1560Ax Hy.66	1190	34.2	1173	115.1	60	25.2
10.	MS4 RxHy.66	1367	54.1	1163	110.9	61	22.8
11.	1582Ax IS-2930-75	1252	41.2	1464	129.5	54	25.2
12.	1502AxIS-10202	1243	40.1	1323	112.5	55	25.4
13.	1587AxPD-12-1	1287	45.1	1323	123.7	57	24.4
14.	15R(904)AxR-16	1261	42.2	1323	110.8	57	26.2
15.	15R(904)AxCS-3541	970	9.2	1032	107.2	57	23.8
16.	573AxR-16	1252	41.2	1323	106.6	58	25.9
17.	A 198-3-10-20-1 x IS-84	952	7.3	1032	113.2	59	23.7
18.	SSH-4134AxIS-3924	934	5.3	1173	109.1	58	29.1
19.	CSH1	1146	29.2	1173	106.5	66	23.8
20.	CSH-7 R	926	4.4	1032	106.0	63	24.7
21.	CSH-8 R	970	9.36	1032	100.7	60	29.7
22.	M.35-1	887	-	1173	132.4	74	33.0
G.M.		1164		1305			
SE.		222		220			
C.D.		N.S.		N.S.			
C.V.		32.8		28.60			

...54..

Results and discussions:

The differences in grain and fodder yields of various hybrids were statistically non signific The experimental hybrid 4 RA x PD-12-1 gave the highest grain yield of 1720 kg/ha. and was clos followed by 4 RA x PD-12-2, Ams-4 R x Hy.66, 15 A x IS-2930,75 and 04258 x R-FB-1233 The ~~[illegible]~~ in grain yield over check was 5 to 93. Most of hybrids matured in be deleting 115 to 118 days. This trial will be continued during the next years, hybrids at Sr. No. 12,17 and 18.

2) Title: Small scale sorghum hybrid trial:

a) Object : To study the yield performance of sorghum hybrids under dryland agriculture.

Forteen hybrids selected during rabi-75 were compared with CSH-1, CSH-7, CSH-8 and M.35-1 in this set trial.

b) Year of commencement : 1976-77.

c) Design : Randomized block design.

d) Replications : Three

e) Plot size : Gross : 6.90 x 2.70 m.

Net : 6.30 x 1.80 m.

f) Results : Table 29.

Conclusion:- The Data reeleal d that the differences in the grain & fodder yiedls due to hybrides were statistically significant. The hybrid 17RA x IS-3924 registered significantly highest yield over all hybrids and check, except hybrid 17RA x PD-2-3 and check CSH-1 . Among others 15R(904) A x IS-34,640 x IS-3924 8RA x IS-2930,75, 17RA x CS 3541,17RA x CS-3541 appeared promising . The percent increase in grain yield over check was 42 4 to 335.

Table 29. Grain and fodder yield, Height, Days to 50% flowering and 1000 grain weight:

Sr. No.	Hybrid	Yield kg/ha Grain	% increase over check	Fodder	Height CM	Days to 50% flowering	1000 grain weight
1.	8 RA x IS-2980-75	1384	117.98	1472	138.7	58	32.1
2.	8 RA x IS-3924	1005	58.27	1613	133.2	58	28.9
3.	17 RA x IS-3924	2760	334.65	2495	141.5	59	27.2
4.	17 RA x PD-2-3	2284	259.69	2354	146.8	61	20.1
5.	648 A x IS-3924	1526	140.31	1675	96.3	61	23.5
6.	17 RA x CS-3541	1446	127.72	1613	119.1	56	24.4
7	4 RA x PD-2-3	1296	104.09	1472	111.5	60	23.1
8.	15 R-(904) A xIS-84	1693	166.61	1763	117.4	60	23.7
9.	15 R(904) x IS-3924	1340	111.02 02	1613	103.1	60	24.9
10.	19 RA x CS-3541	1499	136.06	1613	116.8	58	24.5
11.	648 A x IS 10202	740	16.54	1014	87.8	58	22.4
12.	1582 A x IS-3924	661	4.09	1172	79.0	61	20.8
13.	1258 A x IS-3924	785	23.62	1587	82.40	60	23.9
14.	15 R (904) A x IS 10202	1243	95.75	1613	109.0	59	25.8
15.	CSH-1	1834	188.82	16.13	99.20	64	22.3
16.	CSH-7 R	1446	127.72	1904	109.9	64	24.4
17.	CSH-8 R	1041	61.94	1172	74.4	61	26.3
18.	M. 35-1	635	-	2204	115.4	77	27.8
G.M.-		1446		1631			
S.E.-		348		282			
C.D.-		965		784			
C.V.(%)		42.07		9.72			

3) Title :- Large Scale Sorghum Varietal Trail (Parbhani)

a) Object:- To evaluate the yield potential and wide adaptability of newly developed lines under rainfed conditions.

This set of trial was received from the Sorghum Breeder Marathawada Agriculture University, Parbhani and consisted of thirty different entries along with R-16, M.35-1 CSH-1, CSH-4, CSH-7 and CSH-8 as standard check.

b) Year of commencement :- 1976-77
Entries :- 30 + 6 = 36

c) Design :- Randomised block design

d) Replication :- Three (3)

e) Plot size :- Gross : 8.40 x 2.70 M.
Net : 7.80 x 1.80 M.

f) Results :- Table -30.

Row spacing :- 45 x 15 cm.

Table No. 30. Yield and ancillary data of Large Scale Sorghum Varietal trial (Parbhani)

Sr. No.	Hybrid.	Yield kg./ha Grain	Fodder	Height in CM.	Days to 50% Flowering	1000 grain Wt.(g)
1	2	3	4	5	6	7
1.	PVR-3	2058	4572	168.0	68	27.93
2.	PVR-4	1425	2792	119.7	71	27.35
3.	PVR-5	1816	2905	161.3	66	22.94
4.	PVR-6	1915	2792	120.0	58	33.24
5.	PVR-7	1189	3440	130.7	69	24.45
6.	PVR-8	1545	4330	146.7	74	25.96
7.	PVR-9	2101	3796	162.7	68	25.80
8.	PVR-10	1759	3682	151.0	67	25.98
9.	PVR-11	1965	3383	154.3	64	19.15
10.	PVR-12	1923	3618	144.0	67	22.61
11.	PVR-13	1538	2314	148.3	68	25.13
12.	PVR-14	1524	2193	130.0	64	23.85
13.	PVR-15	1467	3027	117.0	68	21.33
14.	PVR-16	1773	3084	154.7	67	18.68
15.	PVR-17	1189	1780	149.7	68	16.78
16.	PVR-18	1168	2015	136.7	68	22.81
17.	PVR-19	1695	2905	109.7	63	18.61
18.	PVR-20	1631	2435	137.0	68	22.27
19.	PVR-21	1837	2492	138.7	67	20.95
20.	PVR-22	1467	1901	128.7	63	28.74
21.	PVR-23	1866	4394	158.0	69	16.69
22.	PVR-24	1666	3262	150.0	66	18.51
23.	PVR-25	1752	3262	153.0	65	19.61
24.	PVR-26	1517	3205	157.0	68	19.61
25.	PVR-27	1374	2792	127.7	68	20.61
26.	PVR-28	1823	3682	127.7	68	25.43
27.	PVR-29	954	4451	117.7	83	23.96
28.	PVR-30	1460	5106	131.3	81	26.43
29.	PVR-31	1367	3148	160.7	68	18.07

1	2	3	4	5	6	7
30.	PVR-32	1253	2849	122.3	68	23.50
31.	R-16	2094	3262	135.0	66	21.68
32.	M.35-1	1595	4152	173.3	80	23.93
33.	CSH-1	2051	2849	118.3	67	29.35
34.	CSH-4	1844	2435	129.7	67	24.23
35.	CSH-7 R.	1759	2492	93.7	66	26.50
36.	CSH-8	2336	2549	107.0	67	30.94
G.M.		1680	3143			
S.E.		127	384			
C.D. 5%		352	1061			
C.V.(%)		13.13	21.38			

CONCLUSION

The yield data revealed that there was significant differences in the grain and fodder yield of varieties. The check CSH-8 was the best and recorded highest yield of 2336 kg/ha. The varieties PVR-3, PVR-9 and PVR-11 were on par with CSH-8 in grain yield. Among others PVR-5, PVR-6, PVR-12, PVR-21 and PVR-28 were appeared promising. The variety PVR-6 was early maturing, medium in height and was having bold grains.

In fodder yield PVR-30 recorded the highest yield of 51 q/ha followed by PVR-3, PVR-29, PVR-23 and M.35-1.

4) Title: Large Scale Sorghum hybrid trial (Parbhani)

a) Object: To evaluate the yield performance of promising hybrids at different Locations under rainfed conditions.

Twenty three hybrid entries were included in the test. These were compared with CSH-1, CSH-4, CSH-7, CSH-8 and M.35-1. *This set of trial was received from the Sorghum* breeder, Marathawada Agricultural University, Parbhani.

b b) Year of commencement:- 1976-77

Entries : 23 + 5 = 28

c) Design :- Randomised block design

d) Replications:- Three (3)

e) Plot size :- Gross :- 8.40 x 2.70: 1.

Net :- 7.80 x 1.80 M.

f) Results : Table 31.

.....58/-

Sr. NO.	Hybrid	Yield Kg./ha. Grain	Fodder	Height in CM.	Days to 50% Flowering	1000 grain wt
1	2	3	4	5	6	7
1.	CK.60A x PD-3-1-11	2329	2692	119.2	69	25.82
2.	410A x PD-3-1-11	1502	2314	116.5	75	23.83
3.	648A x PD-3-1-11	1730	1780	96.8	70	24.57
4.	648A x IS-3924	1566	1958	126.6	70	21.74
5.	1036A x PD-3-1-11	1424	3739	122.3	78	22.00
6.	1036A x PD-12-2	1659	2314	121.2	73	23.50
7.	1036A x 148	2186	4508	155.5	69	26.10
8.	1202A x PD-3-1-11	1766	1958	109.3	67	19.61
9.	1202A x 168	1958	2670	127.2	66	26.60
10.	1202A x 285	1965	1958	157.1	59	29.28
11.	1202A x 370	1766	2727	112.9	61	25.09
12.	1258A x PD-3-1-11	1823	2015	126.6	69	28.26
13.	1258A x 168	1538	1837	136.3	66	28.35
14.	1258A x 285	2215	2193	177.8	58	32.60
15.	2077A x PD-3-1-11	1396	1602	119.3	69	22.74
16.	2077A x 1235	1225	2549	107.3	79	17.97
17.	2219A x PD-3-1-11	876	2727	114.3	67	26.60
18.	2219A x 370	1346	3796	127.4	62	24.94
19.	2219A x 285	2086	2970	162.1	56	24.65
20.	3660A x PD-3-1-11	1566	1602	124.2	72	23.70
21.	3660A x 148	1225	4508	133.3	71	20.98
22.	3660A x 285	1702	2371	174.3	60	24.96
23.	CSH-1	1581	2670	121.8	66	27.18
24.	CSH-4	2065	2435	135.4	65	27.04
25.	CSH-7	1787	3675	142.8	68	27.04
26.	CSH-8	1225	1538	103.4	68	26.37
27.	M.35-1	1267	4508	180.4	81	31.43
	G.M.	1652	2606			
	S.E.	240	405			
	C.D.	686	1588			

CONCLUSION

The trial was planted on 12th October, 1976. As there was inadequate moisture in the soil the trial was irrigated twice during the crop growth period. First irrigation was applied at sowing and 2nd at heading stage. Eventhough the germination was not satisfactory in almost all the entries. It was poor in (CK.60A x PD-3-1-11, 1036A x PD-12-2, 1202A x PD-3-1-11, 2077A x PD-3-1-11, 1202A x 285 and 1258A x 285 . The seeds of hybrid 1036A x SP-773 failed to germinate.

The yield data revealed that there was significant differences in grain and fodder yield of hybrids. The hybrid CK.60A x PD-3-1-11 recorded the highest grain yield of 2329 Kg/ha & was superior over hybrids at sr. No. 2, 5,13,15,16,18,18,20,21 and the standard check CSH-1, CSH-8 & M.35-1. Among promising others 1258A x 285 1036A x 148, 2219A x 285, 1202A x 168, 1202A x 285 appeared promising.

7) Hybridization Programme:

1) Sorghum Improvement Project Central campus Rahuri.

The crossing programme was taken with an object to breed tolerent/ resitance lines for midge , shootfly grain moulds and to improve grain quality in respect of protein and lysine.

i) A dialed set of 8 x 8 was taken by including parents like 148, 1202 B, Swarna, 36 B, 370, CS.3541 S gril. MR-1. and EC 82 92, to incorporate midge tolerance.

Similarly high yielding varieties like CS-3541, 370, PB-3-1-11 were crossed with midge tolerence lins SC-423 S. Girl MR-1 etc.

ii) For grain mould resistance following crossing programme was undertaken.

IS 9333 x 370, 1202B, CS-3541, 148

IS 9327 x 370, 1202 B, 148, CS-3541.

IS 9530 x 370, 1202 B, 148 and CS-3541.

iii) A new hybrid derivative Hy.66 was crossed with M.35-1 R-16 and SPV-86 for incorporating boldness, earliness and tolerance to shootfly in derivatives, similarly 1235 was crossed with HD-1-1 DH-4-1 H-2 and HD 12-1 etc. to have high yielding shootfly tolerant lines which could be used as pollinators and gh yielding varieties.

iv) A high protein lysine line was crossed with M-35-1 and R-16 to incorperate quality characters and yield components in the derivatives. Similarly the long glume good grained lines IS-9219 and D-15 were crossed with P.D.-3-1-11 and CS-3541 for improving grain characteristics.

v) The grain grass Sorghum types G. 2279, G. 2235 and G. 2127 were crossed with M.35-1 for inducing earliness, tillering etc.

2) Agricultural Research Station Mohol:

Efforts were made to collect the additional sorghum germplasm from different sources. The genetic stock was categorised considering their desirable attributes like high yield, dwarfness earliness, tolerence to shootfly, midge grain moulds and grain quality cherecters etc.

This year about 75 different sorghum lines from the genetic stock were planted in the specially designed sorghum breeding nursery with three dates of planting at an interval of 15-20 days; with a view to undertake crossing programme as below:

Project-1 : Effecting crosses among some sorghum lines for isolating promising material in respect of height (dwarf to medium stature) earliness, good grain colour and size and high tolerance to insect pests and diseases. About 97 crosses were effected, which would be grown in next rabi season.

Project-2 : Combining ability study in L x T programme for incorporating yield, pest tolerance and earliness.

Parents involved Females- GM-1-5, DS 1122, IS 6394

Males: IS5332, IS.84, IS.2930-75, IS.3924; 168, and CS-3541.

Eightean Crosses were effected between three females and six pollen parents and the crossed seeds were collected for further study.

Project-3 : Effecting crosses for isolating lines having earliness, medium plant stature, good grain and high tolerance to insect pests and diseases by Utilising best types from sorghum caudatum group.

Parents involved

i) Promising rabi varieties : M35-1, R-16, PJ.4 R.

ii) Lines from S. caudatum group: IS.73, IS.7058, IS.7124, IS.8541, IS.148 IS.8044, IS.9688, IS.9816, IS.940, IS.2532, IS.3074, IS.8023, IS. 9660, IS.9693, IS.9761, IS.9815, IS.9829.

In all 34 straight crosses were effected.

Project-4 : To develop sorghumlines having high tolerance to midgefly.

Parents involved : (i) Lines having high tolerance to midge : EC. 92792, EC. 92793, EC.92794, SGIRL-MR-I

(ii) Promising rabi lines :

M.35-1, R-16, and SPV-86.

In all 12 crosses were made among these lines and the hybrid seeds were collected for further study.

New Hybrid Combinations :

(i) Crosses were effected among newly developed male steriles and best combiners to produce hybrid combinations for further testing.

MS lines	Pollen parents
36 A , 2077 A, 2219 A, 3660A, 418 A	285, 206, 329, 370, PD-12-2
1202A, 4RA, 1586A, 15R(904)A,	PD-2-3-11, 168, CS.3541 1324,
1258A, 1R(114)A, 158A, 750A.	1235, FR-493, Hy.66.

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(B) Growing of F_1'S : In rabi season-1975 a crossing programme was commenced between tall late Indian and exotic early dwarfs and Indian x Indian types. Nine Is conversion lines including give dwarf lines were among the early parents; adapted parents included seven good lines from the AICSIP programme: three which appeared good in kharif and two in rabi. High lysine types included were IS.11167 and IS.11758.

The F1 generations of 76 single crosses was grown alongwith their parents in the rabi-76. Of which 66 crosses were successful. The F1's were seflfed and seeds of individual plants were collected for studying in in F2 generation during next season.

		No.of crosses grown	Succesful crosses
i) Indian x exotic types	:	37	31
ii) Rabi x kharif types	:	24	21
iii) kharif x kharif	:	9	8
iv) Rabi x Rabi	:	6	6
		76	66

(C) Growing of F2's:

i) F2 population of 10 crosses between kahrif x rabi types was grown fro isolating the material with desired yield attributes and photopheriod insensitiveness.

About 1500 to 2000 plant population (F2's) of each cross were grown. Individuals having good plant type, earliness, long big panicle and lustrous bold grains were selected from each cross.

Cross	No. of desired plants selected
1. M.35-1 x PJ.4 R	50
2. M.35-1 x ND-15	30
3. M.35-1 x Imp-Saoner	60
4. M.35-1 x Shenoli-4-2	40
5. PJ.4R x ND-15	20
6. PJ.4R x Imp.Saoner	50
7. PJ.4R x Shenoli-4-2	40
8. ND-15 x Imp.Saoner	45
9. ND-15 x Shenoli-4-2	25
10. Imp.Saoner x Shenoli-4-2	30

The selected F2 plants will be studied in F3 generation during the next season for their tolerance /resistance to shootfly, yield, earliness etc.

.....62/-

ii) Developing genetically divergent female lines in sorghum.

A 6 x 6 diallel crossing programme was initiated in rabi-1974 among the existing promising 'B' lines (10368, 12508, 6408, 36 B / 22198 and 15078) to create variation amongst the 'B' lines to evolve better recombinations.

The resultant 15 F1 gnerations alongwith their parents were grown during rabi-1975 and the subsequent F2 populations of were planted in rabi 1976. Based on plant type, grain characteristics, ear types, stature and earliness 213 individual plant selections were selected, which would be grain in kharif 1977.

D) Growing of F3 's

One hundred fifty F3 cultures of ten crosses involving exotic and Indian lines were grown in seven sets and studied for good plant type, semicompact ear bold grains, less glume coverage and earliness. Twenty promising cultures were selected for further study.

3. Germ plasm collection

Ninty different male sterile lines alongwith their counter parts (B lines) were planted, studied and maintained for further exploitation.

Promising selections were effected in 'B' lines of 4 RA 8 RA, 17 RA and D22-15 based on head type, boldness of grain plant height etc.

.....63/-

Summary of Results:

1) Advanced Sorghum Varietal/hybrid Trial

This trial was conducted at central campus Rahuri.

The released hybrid CSH-8 R yielded significantly superior over all other entries.

2) Preliminary Sorghum varietal Trial-I

This tiral was conducted at Rahuri.

The released hybrid CSH-8 R (5259 kg/ha) yielded significantly superior and is on par with 1202 A x 285 (4631 kg/ha) and CSH-7 R (4533 kg/ha)

The hybrid 1202 A x 285 posses tolerance to shootfly, good cob shape, grain size and flowers in about 48 days and matures in 95-100 days.

3) Preliminary Sorghum varietal Trial -II:

This trial was conducted at Rahuri and Mohol.

The hybrid CSH-8 R performed well at both the locations giving average yield of 2737 kg/ha. The new varieties 91-4 (2415 kg/ha) and 91-5 (2407 kg/ha) also performed well at both the locations.

4) Parental line trial:

This trial was conducted at Rahuri and Mohol.

The average performance of 1202 B and CK 60 B at both the locations in good 1202 B flowers in 56 days and is having medium bold lustrous grains with tolerance to shootfly.

5) Large scale sorghum hybrid trial :

This trial was conducted at Rahuri and Mohol.

The average performance of 4 RA x Hy. 60 (2100 kg/ha) at both the locations is satisfactory. This hybrid will be tested in the Co-ordinated trials of rabi 1977.

) Sorgum yield trials:

These yield trials were taken at A.R.S. Mohol:

Forty four sorghum hybrids produced at Mohol were tested under three sets of trial for identifying best hybrid for cultivation under dry land agriculture. Out of these following hybrids were appeared promising.

.....64/-

i) Preliminary sorghum hybrid trial; The hybrid 4RA x PD-12-1 produced highest grain yield and was closely followed by 4 RA x PD-12-2, Ams 4 R x Hy.66, 1487 A x PD-12-1 and 15 R(904) A x R-16.

ii) Small Scale sorghum hybrid trial: The sorghum hybrid 17 R x IS-3924 registered significantly higher yield (1520 kg./ha) over all hybrids and check under test. Among others 17 RA x PD-2-3, 15 R(904) A x IS.34 648 A x IS.3924, 8RA x IS.2930-75, 17RA x CS.3541 19RA x CS.3541 were appeared promising.

Regional trials:

(i) Large scale sorghum varietaltrial(Parabhani)

Thirty different varieties received from the Sorghum breeder, Marathwa Agriculture University, Parabhani tested for their yield performence in comparision with CSH-1,CSH-4,CSH-7,CSH-8, R-16 and M.35-1. None of the variety proved superior in yield to the hybrid CSH-8. The varieties PVR-3,PVR-9 and PVR-11 were on par with CSH-8 in grain yield. Among oth PVR-5,PVR-6,PVR-12,PVR-21 and PVR-23 were appeared promising.

(ii) Large scale sorghum hybrid trial(Parabhani).

This set of trial was also received from Parabhani. It included 23 hybri entries alongwith CSH-1,CSH-4,CSH-7,CSH-8 and M.35-1. The hybrid CK. 60A x PD-3-1-11 recorded the highest grain yield of 2329 kg./ha. The others in order of merit were 1258 A x 285, 1030 A x 148, 2219 A x 285, 1202 A x 168, 1202A x 285.

(2) Hybridization :

Varietal Development: (A) Effecting crosses: Crosses were effected among various sorghum lines for developing the best variety or varieties which will be suitable for planting under dryland agriculture. While effecting crosses more emphasis was laid on (i) yield, followed by (ii) early duration, midtall stature, combing good grain & fodder quality (iii) high tolerance to insect/pest and diseases(iv) high tolerance to drought.

In all161 single crosses were effected among various sorghum lines with the afore said objects in veiw.

(B) Growing of F1 's: The F1 generations of 76 single crosses were grown alongwith their parents in the rabi-76. Of which 66 crosses were successful.

.....66/-

The F1's were selfed and seeds of 670 successful plants were collected for studying in F2 generation during next season.

C) Growing F2'S: (i) F2 populations of 10 crosses between kharif x Rabi types was grown for isolating superior material inrespect of yield, earliness drought tolerance and photoperiod insensitiveness. 390 desired plants were selected for further study.

ii) F2 populations of 15 crosses among six promising 'B' lines were planted in rabi-76. 213 desired character recombinations were selected for further study and exploitation.

D) Growing of F3 's : One hundred fifty F3 cultures of different ten crosses were grown, in seven sets & studied for good plant type, semicopact head, bold grains, less glume coverage & early in flowering duration. Twenty promising cultures were selected for further study.

2) AGRONOMY:

I) Central Campus, Rahuri :

1 (a) Title : Uniform Agronomic trial of Rates of Nitrogen.

(b) Object :To study the responce of new sorghum entries to nitrogen levels in different agroclimatic regions and to determine the economic optimum dose of nitrogen.

(c) Year of the experiment: First year.

(d) Treatments : 16

i) Rates of nitrogen : 4

a) N_0-0 kg N/ha. c) N_2-60 kg N/ha.

b) N_1-30 kg/ha. d) N_3-90 kg N/ha.

ii) Entries : 4

a) E_1- CSH-7 R c) E_3-SPV-86

b) E_2- CSH-8 R d) E_4-M.35-1.

e) Date of sowing : 25-9-76.

f) Design : Randomised block.

g) Replications : Four

h) Plot size : Gross: 10.0 m x 3.6 m = 36.0 m^2

Net : 8.0 mx2.7 m = 21.6 m^2

i) Fertilization : Nitrogen (through Urea) as per the treatments + 60 kg P_2O_5/ha in the form of single superphosphate entrire at the time of sowing.

j) Harvesting : 16-1-77 and 21-1-77.

k) Results are presented in table 32 and 33.

Table 32 : Grain yield q/ha.

E/N	Levels of Nitrogen				
	0	30	60	90	Mean
E_1 (CSH-7 R)	24.38	27.27	29.85	30.74	28.06
E_2 (CSH-8 R)	23.03	27.33	31.36	34.06	28.94
E_3 (SPV-86)	22.25	25.74	30.05	29.10	26.80
E_4 (M.35-1)	20.94	24.24	27.44	29.98	25.65
Mean	22.65	26.14	29.67	30.99	

	S.E. ± q/ha.	C.D. at 5% q/ha.
Nitrogen :	0.62	1.77
Entries :	0.62	1.77
(E x N) :	1.24	-

Table 33. Fodder yield q/ha:

E/N	Levels of Nitrogen 0	30	60	90	Mean
E_1-(CSH-7 R)	23.15	23.70	26.02	25.08	24.73
E_2-(CSH-8 R)	17.36	16.76	24.01	24.91	20.90
E_3 (SPV-86)	30.09	31.25	32.96	33.01	31.83
E_4 (M.35-1)	52.64	49.63	54.40	57.87	53.63
Mean	30.01	30.32	34.57	35.46	

	S.E. ± q/ha.	C.D. at 5% q/ha.
Nitrogen:	1.29	3.66
Entries :	1.29	3.66
(E x N) :	2.58	3.--

CONCLUSIONS:

Grain yield: Application of 30,60 and 90 kg N/ha produced significantly more grain yield (26.14, 29.67 and 30.09 q/ha), than control. Nitrogen level of 60 and 90 kg N/ha also produced significantly more grain yield than 30 kg N/ha, however 60 and 90 kg N/ha were on par.

The new rabi hybrid CSH-8 R produced the highest grain yield and was significantly superior to variety SPV-86 and M.35-1. Hybrid CSH-7 R, CSH-8 R and variety SPV-86, M.35-1 were on par within themselves.

The interaction between E x N found to be non-significant.

Fodder yield : Application of 60 and 90 kg N/ha produced significantly more fodder yield than 0 and 30 kg N/ha. Significant differences were not observed amoungs 0,30 and 60, 90 kg N/ha.

The local variety M.35-1 yielded the highest fodder yield and was significantly superior than the rest. The entry SPV-86 also produced significantly more fodder yield than the hybrids. The new hybrid CSH-7 R was also found to be superior than CSH-8 R.

The interaction was found to be non significant.

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2. (a) Title : Uniform Agronomic Trial of plant population x Entries.

(b) Object : To determine the optimum plant population of new Sorghum rabi hybrids and variety in comparision with local in various agroclimatic conditions.

(c) Year of the experiment : First year.

(d) Treatments : 16.

(

i) Population : 4

a) P_1-45,000 plants/ha. c) P_3-1,35,000 plants/ha.

b) P_2-90,000 plants/ha. d) P_4-1,80,000 plants/ha.

ii) Entries : 4

a) E_1- CSH-7 R c) E_3-SPV-86

b) E_2- CSH-8 R d) E_4-M.35-1.

(e) Date of sowing : 26-9-1976

(f) Design : Randomised block

(g) Replications : Four

(h) Plot size: Gross : 12.0 m.x 5.4 m. = 64.8 m^2

Net : 10.0 m x 3.6 m = 36.0 m^2.

(i) Fertilization : 80 kg N + 60 kg P_2O_5/ha. through Urea and siggle supper phosphate at the time of sowing.

(j) Harvesting : 25-1-77 and 1-2-77.

(k) Results are presented in table : 34 and 35.

Table 34 Grain yield q/ha:

E/P	Levels of population P_1 (45,000)	P_2 (90,000)	P_3 (1,35,000)	P_4 (1,80,000)	Mean
E_1 (CSH-7 R)	27.22	28.55	31.85	32.43	30.01
E_2 (CSH-8 R)	24.54	28.14	29.20	29.72	27.90
E_3 (SPV-86)	23.50	22.91	29.18	29.88	26.37
E_4 (M.35-1)	23.73	24.52	26.18	30.26	26.17
Mean	24.75	26.03	29.10	30.57	

	S.E.+ q/ha	C.D. at 5% q/ha.
Population :	0.82	2.33
Entries :	0.82	2.33
(P x E) :	1.64	-

.....69/-

Table 35. Fodder yield q/ha:

E/P	Levels of population				
	P_1 (45,000)	P_2 (90,000)	P_3 (1,35,000)	P_4 (1,80,000)	Mean
E_1 (CSH-7 R)	26.39	28.47	30.19	35.06	30.03
E_2 (CSH-8 R)	16.31	18.06	24.30	24.64	20.83
E_3 (SPV-86)	27.08	29.17	30.19	33.67	30.03
E_4 (M.35-1)	46.17	45.14	48.25	57.64	49.30
Mean	28.99	30.21	33.23	37.75	

	S.E. ± q/ha	C.D. at 5% q/ha
Population :	0.82	2.33
Entries :	0.82	2.33
(P x E) :	1.64	-

CONCLUSIONS:

Grain yield: The population P_3 (1,35,000 Plants/ha) and P_4 (1,80,000 plants/ha) produced 29.10 and 30.57 q/ha grain yield and were significantly superior to P_1 (45,000 plants/ha) and P_2 (90,000 plants/ha) which yielded 24.75 and 26.03 q/ha respectively. The significant differences were not observed between P_1, P_2 and P_3, P_4 treatments.

In the case of entries new rabi hybrid CSH-7 R produced the highest grain yield (30.01 q/ha) and was significantly superior to high yielding variety SPV-86 (26.37 q/ha) and local M.35-1 (26.17 q/ha). The hybrid CSH-8 R SPV-86 and M.35-1 were on par. No significant difference were observed between CSH-7 R and CSH-8 R.

The interaction was found to be non significant.

Fodder yield: The fodder yield increased as the population density increased in respect of all the entries.

The local variety M.35-1 produced the highest fodder yield and was significantly superior than the rest entries. The hybrid CSH-7 R and variety SPV-86 produced significantly more fodder yield than CSH-8 R, However they were on par.

The interaction effect was found to be non-sig-nificant.

3 (a) Title : Meeting aberrant weather Mid-season correction contingency experiment.

Back ground information:

Under rainfed condition, plant populati... should be adjusted according to soil moisture re... In Rabi season the amount of soil moisture reser... on the September, October rains. The soil moistu... a limiting facter when September, October rains fa... Hence, to meet such conditions, this experiment w... planned.

(a) Object : To adjust plant poopulation according to soil mo... reserve under rainfed condition. Variety : CS4-8 R

(b) Year of the experiment : First.

(c) Treatments : 6

i) T_1-Original 1,80,000 plant population /ha

ii) T_2 -Original 1,80,000 plant population/ha + straw mulch

iii) T_3-Remove every alternate row (Population ...

iv) T_4- Remove every third row (population 1,20...

v) T_5- Remove every alternate plant with-in the ... (population 90,000/ha)

vi) T_6- Remove every third plant with-in the ... (population 1,20,000/ha).

e) Date of sowing : 29-9-76

f) Design : Randomised Block.

g) Replications : Four

h) Plot size: Gross: 14.0 m x 7.54 m = 105.56 m^2
Net : 13.0 m x 5.54 m = 72.2 m^2

i) Fertilization : 60 kg N + 30 kg P_2O_5/ha through Urea and ... phosphate at the time of sowing.

j) Harvesting : 12-1-77

k) Results are presented in Table: 36 and 37.

Table 36 Grain ... /ha:

Table 36. Grain yield q/ha:

T/R	I	II	III	IV	Mean
T_1	26.92	24.67	25.80	25.55	25.23
T_2	28.03	27.23	26.57	27.08	27.23
T_3	20.40	24.72	24.15	23.09	23.09
T_4	27.77	27.06	25.55	27.87	27.06
T_5	24.30	27.44	23.86	25.38	25.24
T_6	26.75	28.18	24.90	25.82	26.41
Mean	25.70	26.55	24.80	25.80	

	S.E. ± q/ha	C.D. at 5% q/ha.
Treatment :	0.65	1.95

Table 37. Fodder yield q/ha:

T/R	I	II	III	IV	Mean
T_1	22.22	18.05	18.74	20.13	19.78
T_2	15.77	19.44	20.83	22.22	19.56
T_3	15.77	15.27	13.80	14.58	14.87
T_4	18.74	19.44	15.97	23.60	19.39
T_5	19.44	18.05	15.97	17.36	17.65
T_6	18.05	18.74	19.33	21.52	19.09
Mean	18.33	18.16	17.17	19.90	

	S.E. ± q/ha	C.D. at 5% q/ha
Treatment:	0.97	2.92

CONCLUSIONS:

The treatments mamely original plants 1,80,000 + straw mulch (T_2), 1,20,000 plant population maintained by removing third row (T_4) and third plant within the row (T_6) produced 27.23, 27.06 and 26.41 q/ha grain yield respectively and were significantly superior than 1,80,000 population/ha (T_1) and 90,000 population/ha(T_3) and amongst themselves, they were on par. Original 1,80,000 plants (T_1) and 90,000 population maintained by removing every alternate plant within the row (T_5) were also superior than 90,000 plants /ha by removing every alternate row (T_3).

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Original 1,80,000 plants/ha (T_1) produced the highest yield and trend of other treatments was similar to the grain yield.

4. (a) Title: Advanced dates of Sowing.

(b) Object: The object of the experiment was to examine the possi of advancing the dates of sowing of Sorghum and to stu relative performance of some promising new rabi cultiva comparision with the local M.35-1.

(c) Year of the experiment: First year.

(d) Treatments: i) Sowing dates : 5

a) D_1-1-9-76 b) D_2-10-9-76
c) D_3-20-9-76 d) D_4-30-9-76.
e) D_5-10-10-76.

ii) Entries : 4

a) E_1-CSH-7 R c) E_3-SPV-86
b) E_2-CSH-8 R d) E_4-M.35-1

iii) Carbofuran treatments: 2

a) Co-untreated
b) C_1-seed treated with carbofuran.

e) Design : Scattered block design.

f) Replications: Four

g) Plot size : Gross 10.0 m x 2.7 m = 27.0 m^2
Net 8.0 m x 1.8 m = 14.4 m^2

h) Fertilization: 80 kg N + 60 kg P_2O_5 per hectare through Urea an single super phosphate entire at the time of sowing

i) Harvesting :

D_1- 4 and 5-1-1977. D_2-6-1-77 to 10-1-77
D_3-19-1-77 D_4 28-1-77 to 1-2-77
D_5- 5 and 6-2-77.

j) Results : Table 38, 39, 40 and 41.

Table 38. Dates x Entreis:

E/D	Grain yield q/ha				
	D_1 (1-9-76)	D_2 (-10-9-76)	D_3 (20-9-76)	D_4 (30-9-76)	D_5 (10-10-76)
E_1 (CSH-7 R)	32.78	32.82	28.61	24.18	10.74
E_2 (CSH-8 R)	32.37	32.93	30.93	22.60	9.19
E_3 (SPV-86)	38.16	39.75	29.58	23.71	6.67
E_4 (M.35-1)	33.53	34.57	32.65	23.31	3.83
Mean	34.21	35.02	30.44	23.45	7.61

Table 39. Entries x Carbofuran:

Grain yield q/ha

C/E	E_1 (CSH-7R)	E_2 (CSH-8 R)	E_3 (SPV-86)	E_4 (M.35-1)	Mean
C_0	23.16	25.21	26.88	24.87	24.88
C_1	28.49	26.00	28.87	26.29	27.41
Mean	25.83	25.60	27.57	25.58	

	S.E. ± q/ha.	C.D. at 5% q/ha
Dates :	0.78	2.21
Entries:	0.70	-
Carbofuran	0.49	1.39
Interactions:		
(D x E)	1.58	4.42
(E x C)	1.12	-
(D x C)	1.00	-
(D x E x C)	2.24	-

Table 40 Dates x Entries:

Fodder yield q/ha

E/D	D_1 (1-9-76)	D_2 (10-9-76)	D_3 (20-9-76)	D_4 (30-9-76)	D_5 (10-10-76)	Mean
E_1 (CSH-7 R)	38.19	31.25	28.61	32.57	26.87	31.49
E_2(CSH-8 R)	31.25	25.14	26.46	28.68	26.46	27.60
E_3(SPV-86)	47.71	43.82	42.08	48.61	39.51	44.35
E_4(M.35-1)	92.92	72.50	63.82	67.29	60.76	71.46
Mean	52.52	43.18	40.24	44.29	38.40	

Table 41 Entries x Carbofuran:

Fodder yield q/ha

C/E	E_1 (CSH-7 R)	E_2 (CSH-8R)	E_3 (SPV-86)	E_4 (M.35-1)	Mean
C_0	28.61	26.74	41.67	62.85	39.97
C_1	34.37	28.47	47.08	80.00	47.88
Mean	31.49	27.61	44.38	71.43	

	S.E. ± q/ha	C.D. at 5% q/ha
Dates :	1.32	3.70
Entries :	1.18	3.31
Carbofuran	0.83	2.34
Interactions		
(D x E)	2.64	7.41
(E x C)	1.67	4.69
(D x C)	1.87	-
(D x E x C)	3.74	-

CONCLUSIONS:

Grain yield:

The comparision of mean values of grain for different dates of sowing indicated that the treatment D_1 (1-9-76) and D_2(10-9-76) gave significantly higher grain yield as compared to D_3(20-9-76), D_4 (30-9-76) and D_5 (10-10-76). The treatment D_3 was significantly superior to D_4 and D_5 treatment D_4 also gave significantly more grain yield than D_5.

The yield of entries did not differ significantly. However the highest grain yield was produced by high yielding variety SPV-86.

The seed treatment with carbofuran was found to be significantly superior than the untreated seed.

The interactions except Dates x Entries were non significant. All entries produced more grain yield at D_2 (10-9-76) treatment than D_1(1-9-76) and there after reduction is observed.

Fodder yield: As regards fodder yield, the treatment D_1 produced the highest fodder and was significantly superior than the rest of the treatments. D_4 treatment produced significantly more fodder yield than D_3 and D_5. However D_2 , D_4 and D_3, D_5 were on par.

The local variety M.35-1 produced the highest fodder yield and was significantly superior than the rest entries. The high yielding variety SPV-86 produced significantly morre fodder than CSH-7 R and CSH-8 R. The hybrid CSH-7 R was also superior to the CSH-8 R.

The seed treatment with carbofuran affected the fodder yield significantly than untreated seed.

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The interactions between dates of sowing x entries and entreis x carbofuran were found to be significant. All hybrids and varieties produced more fodder yield at D_4 than D_2 and D_3 except M.35-1.

The rabi season was very peculion this year since it rained very little in the months of September, October and as such the sowing were effected by giving one irrigation initially. The stand of the crop was also not uniform especially is the hybrids due to poor quality seed. The experiment will be repeated.

5) a) Title : Input x Management Interaction study.

b) Object : To compare improved technology with local practices, the levels of management on farmers field and to work out the economics of production at different levels of imputs and management.

c) Year of the experiment: First year.

d) Treatments: 4

i) T_1 High input + High Management.

ii) T_2 High input + Low management.

iii) T_3 Low input + Low management.

iv) T_4 Low input + High management.

e) Date of sowing : 15-9-76

f) Plot size : Harvested 42.00 m. x 17.10 m.

g) Fertilization : 80 kg N + 60 kg. P_2O_5/ha in case of high input and 40 kg. N + 30 kg P_2O_5/ha. in case of low input.

h) Harvesting : 18-1-77

i) Results are presented in Table- 42.

Table 42. Mean grain, fodder yield, cost of cultivation and net profit /ha as affected by different treatments.

Treatment	Grain yield q/ha	Fodder yield q/ha	Cost of cultivation Rs./ha	Total income Rs./ha	Net income Rs./ha.
T_1 High In-put + High Management	33.77	26.31	1517.25	3640.10	2122.85
T_2 High In-put + Low Managment	2854	27.15	1246.80	3125.50	1878.70
T_3 Low Input + Low Managment	17.40	17.54	982.95	1915.40	932.45
T_4 Low Input + High Managment	17.12	24.36	1253.40	1955.60	702.20

(Rate of grain Rs. 100/q and fodder Rs. 100/M. tonne).

The highest grain yield was recorded in High input + High Management (T_1) treatment, which was followed by High input + Low Management (T_2) treatment. Treatment T_1 produced 48.47 and 49.30 % more grain yield than Low Input + Low Management (T_3) and Low Input + High Management (T_4) treatments respecti The treatment T_2 also produced 39.03 and 40.01 % more grain yield than T_3 and T_4 respectively.

The net profit received from treatment T_1 and T_2 was more than double to T_3 and T_4 treatments.

6) a) Title : Ratoon experiment on CSH-1

b) Object: To study the yielding ability of ratoon of CSH-1 influenced by various treatments.

c) Year of the experiment: Second.

d) General information : The main crop was sown on 30-6-76 by maintaining the proper plant population. The main crop was fertilized with 80 kg N + 60 kg P_2O_5/ha. The mean grain yield obtained from the main crop was 42.00 q/ha.

e) Treatments: 30

A) Main treatments :3
(time of Harvesting)

i) H_1-15 days before due date of harvest of main crop
(35% moisture in grain)

ii) H_2- Harvesting of main crop before 7 days.

iii) H_3-Harvesting of main crop at due date.

B) Sub-treatments: 5
(Irrigation)

i) I_0-No irrigation

ii) I_1-One irrgation after one month of harvest of main crop.

iii) I_2-One irrigation at boot stage of crop.

iv) I_3-One irrigation at grain setting stage.

v) T_4-Irrigation at all stages.

C) Sub-sub-treatments:2
(Tillers)

i) T_1-One tiller per shoot

ii) T_2-Two tillers per shoot

f) Design : Split plot design.

g) Replications: Three.

h) Plot size : Main: 12.0 m. x 3.6 m.=43.2 m^2
Sub-plot-6.0 m x 3.6 m. =21.6 m^2
Harvested:- 5.4 m x 2.7 m =14.58 m^2

i) Fertilization : 60 kg N + 50 kg P_2O_5/ha through Urea and single super phosphate was applied to the ratoon crop as basal dose.

j) Harvesting:

	Main crop	Ratoon crop
H_1	5-10-76	3-2-77
H_2	12.10.76	9.2.77
H_3	19.10.76	16.2.77

k) Results : Are given on table: 43 to 48

Table No. 43 Harvesting x Irrigation

I/H	Grain yield q/ha			
	H_1	H_2	H_3	Mean
I_0	11.33	10.64	6.18	9.38
I_1	15.86	11.38	4.40	10.55
I_2	14.72	10.66	4.15	9.84
I_3	13.11	8.74	4.23	8.71
I_4	17.41	12.78	6.59	12.26
Mean	14.49	10.84	5.12	

Table-44 Harvesting x Tillers:

T/H	Grain yield q/ha			
	H_1	H_2	H_3	Mean
T_1	12.76	9.18	5.73	9.22
T_2	16.21	12.48	4.52	11.07
Mean	14.49	10.84	5.12	

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Table 45 Irrigation x Tillers:

T/I	Grain yield q/ha					
	I_0	I_1	I_2	I_3	I_4	Mean
T_1	7.74	10.38	8.70	7.00	12.28	9.22
T_2	11.03	10.72	10.99	10.42	12.19	11.07
Mean	9.38	10.55	9.84	8.71	12.24	

	S.E. ± q/ha	C.D. at 5% q/ha
Harvesting	0.60	1.71
Irrigation	0.78	2.21
Tillers	0.49	1.40
Interactions:		
(H x I)	1.36	-
(H x T)	0.86	2.42
(I x T)	1.10	-
(H x I x T)	1.92	-

Table 46 Harvesting x Irrigation:

I/H	Fodder yield q/ha			
	H_1	H_2	H_3	Mean
I_0	7.41	7.41	7.41	7.41
I_1	10.84	13.72	8.02	10.86
I_2	14.88	12.55	10.84	12.76
I_3	10.29	10.84	8.37	9.83
I_4	15.43	18.38	12.30	15.27
Mean	11.77	12.58	9.33	

Table 47 Harvesting x Tillers:

T/H	Fodder yield q/ha			
	H_1	H_2	H_3	Mean
T_1	9.40	10.29	7.34	9.01
T_2	14.20	14.61	12.14	13.65
Mean	11.80	12.45	9.74	

Table 48 Irrigation x Tillers:

T/I	Fodder yield q/ha					
	I_0	I_1	I_2	I_3	I_4	Mean
T_1	5.69	8.78	10.29	8.02	12.21	9.01
T_2	9.12	12.96	15.23	12.21	18.72	13.65
Mean	7.42	10.87	12.76	10.11	15.46	

	S.E. ± q/ha	C.D. at 5% q/ha
Harvesting	0.48	1.36
Irrigation	0.62	1.76
Tillers	0.39	1.11
Interactions		
(H x I)	1.08	-
(H x T)	0.68	-
(I x T)	0.88	-
(H x I x T)	1.52	-

Conclusions:

Grain yield: The treatment harvesting of main crop 15 days before due date of harvest (H_1) produced the highest grain yield (14.49 q/ha) and was significantly superior to 7 days before due date of harvest (H_2) and at due date of harvest (H_3) treatment. The treatment (H_2) also produced significantly more grain yield than (H_3) treatment. Last year the harvesting treatments did not differ significantly, probably due to contiuness rains upto November.

Irrigation at all stages (I_4) produced the highest grain yield (12.26 q/ha) and was significantly superior than the rest of the treatments except one irrigation one month after harvest (I_1). Last year irrigation one month after harvest and at grain setting stage of ratoon crop was found to be beneficial. Irrigation at all stages was not included during the last year.

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Two tillers per shoot (T_2) produced 11.07 q/ha grain yield and was significantly superior than one tiller per shoot (T_1) viz. 9.22 q/ha grain yield. Last year the same trend was also observed.

Interactions except Harvesting x Tillers were found to be not significant. Two tillers per shoot (T_2) produced more grain yield than T_1 at H_1 and H_2 treatments of harvesting. However the reduction is observed at H_3 treatment.

Fodder yield :Harvesting of main crop 7 days before due date of harvest (H_2) produced the highest fodder yield and was significant superior than H_3 treatments. However, H_1 and H_2 treatments were on par.

Irrigation at all stages (I_4) produced the highest fodder yield and was significantly superior than rest of the treatments. Irrigation at boot stage of the crop (I_2) was also significantly superior than I_0, irigati one month after harvest of main crop (I_1) and irrigation at grain setting stage (T_3). Treatments I_1 and I_3 were also superior to control. However, they were on par.

Two tillers per shoot (T_2) produced significa more fodder yield than the one tiller per shoot (T_1).

None of the interactions were found to be significant.

Since precipitation was very less during the months of Sept, October and as main crop was harvested during October, the sprouting of tillers was very poor, resulting in poor yields. It is therefore, suggested that excepting the control (No irrigation), in the rest of the treatments basal irrigation immediately after harvesting of main crop be given.

a) Title : Trial on leaf sugary disease on Sorghum.

b) Object : To study the effect of dates of planting and fertilizati on incidence of leaf sugary disease.

c) Year of the experiment: First

d) Treatments : 42

I) Main treatments:
(Meteorological weeks): 7
34,36,38,40,42,44, and 46.

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II) Sub-treatments: 2
(Varieties)

E_1-CSH-8 R E_2- M.35-1

III) Sub Sub-treatments : 3
(Fertilizations)

i) N_0P_0 kg/ha ii) N 50 P_0 kg/ha iii) N_0 P_{25} kg/ha

e) Design : Split plot design

f) Replications : Three

g) Plot size : Gross : 5.40 m x 2.70 m
Net : 4.40 m x 1.80 m

h) Results : The date is not ready due to late harvesting and the same may be presented in the next year report.

Completed Experiment

Experiment: Uniform Agronomic trial of Rate of Nitrogen:-

The experiment was conducted at Rahuri during the last three years in rabi season and the result of pooled data of grain yield is given in Table 49

Table : 49 Grain yield in q/ha.
(Year 1973-74 to 1975-76)

E/N	Levels of Nitrogen				
	0	30	60	90	Mean
E_1-(R-16)	11.90	14.99	20.13	23.18	17.56
E_2-(CSH-1)	11.11	15.69	19.41	24.94	17.79
E_3-(M.35-1)	11.33	15.50	18.55	19.69	16.27
Mean	11.45	15.39	19.38	22.60	

	S.E. ± q/ha	C.D. at 5% q/ha
Entries :	0.43	1.24
Levels of 'N'	0.50	1.43
Interaction(EXN)	0.87	-

Results:

The three years data from table 49 indicated that the variety R-16 and CSH-1 produced (17.56 & 17.79 q/ha) significantly more grain yield than local M.35-1 (16.27 q/ha). However they were on par.

Increase in level of nitrogen increased the grain yield significantly. Incase of nitrogen linear response was observed. Application of 30, 60 and 90 kg N/ha were increased 34.41, 69.26 and 97.38 % grain yield over control respectively.

The interaction was found to be nonsignificant.

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ii) Agricultural Research Station Mohal :

1) Title : Rates of Nitrogen x Germplasm

Object: i) To study the response of sorghum entries to nitrogen levels

ii) To determine the economic dose of N.

Year of commencement:- 1976-77.

Treatments: a) Varieties:- CSH-7R, CSH-8R, SPV-86 & M. 35-1

b) N level (kg/ha):- 0,30,60 and 90

Design: Randomised block design

Replications:- Four (4)

Plot size : Gross:- 8 rows 10 m length = 36.0 m^2

Nte :- 6 rows 8 m lenght = 21.6 m^2

Spacing:- 45 x 15 cm.

Date of sowing:- 9th September, 1976

Basal manuring:- 60 Kg P_2O_5 + 40 K_2O/ha.

Rates of N x Germplasm

Table : 50 Grain & fodder yield as affected by N levels & varieties q/ha

Treatment		Grain	Fodder
A) N level	0	7.08	8.79
	30	8.05	10.11
	60	8.51	11.11
	90	10.23	12.03
	S.E.	0.53	0.40
	C.D.	1.48	1.28
B) Varieties:			
	CSH-7R	8.28	8.79
	CSH-8R	8.84	7.77
	SPV-86	8.87	11.57
	M.35-1	8.28	14.81
	S.E.	0.53	0.40
	C.D.	N.S.	1.28

Results & discussions:

The data in the Table 50 showed that nitrogen application increased the yield of grain and fodder of jowar significantly. Application of 90 Kg.N/ha produced significantly higher yield than 0(control), 30 and 60 Kg. N/ha.

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the differences in yield among 0(control), 30 and 60 Kg. N/ha were not significant. In the case of fodder yield there was significant increase due to application 90 Kg.N/ha) over '0' and 30 Kg.N/ha. Application of 60 and 90 Kg.N/ha were on par.

The varieties did not show any significant differences in grain yields due to various levels of N amongst themselves. In case of fodder M.35-1 gave significantly highest yield of 14.8 q/ha.

Further, interaction between varieties and nitrogen was not found to be exiting in the case of grain yields. However it was present in case of fodder. M.35-1 produced highest fodder yield at 30, 60 and 90 Kg.N/ha than 0 Kg N/ha.

2) Title:- Plant Population x rates of Nitrogen.

Object: To determine the optimum plant population and dose of nitrogen for sorghum variety G.M. 1-5

Year of commencement: 1976-77

Treatments: (a) Plant population: 4
45, 90, 135 & 180 '000' plants/ha.
(b) Rates of N : 4
0, 30, 60 and 90 kg/ha.

Design:- Randomised block design

Replications:- Four (4)

Plot size :- Gross :- 6.90 x 5.40 M.
Net :- 5.70 x 3.60 M.

Spacing:- (a) Between rows - 90 CM.
(b) Between plants- As per treatment i, e.6,12,18, & 24 cm.

Basal manuring 60 Kg P_2O_5/ha. 40 Kg K_2O/ha 'N' as per treatments

Date of sowing: 6th November, 1976.

Date of harvest:- 25th March, 1977

Irrigations : Three (first at Planting, Heading, dough stage)

Plant population x Rates of Nitrogen

Table 51 Grain & fodder as affected by plant popuation & N levels (q/ha)

Treatment	Grain	Fodder
A) Plant population,000/ha		
45	17.93	25.83
90	19.10	27.29
135	23.93	35.28
180		

S.E.	1.15	1.22
C.D.	3.19	3.39

B) Dose of N in Kg/ha.

0	14.77	29.24
30	20.22	31.68
60	23.05	33.63
90	28.36	34.60
S.E.	1.15	1.22
C.D.	3.19	3.39

Results & discussions:

The data presented in Table 51 indicated that the differences in the grain and fodder yields of jowar variety-Gm-1-5 were statistically significant. The grain yields obtained due to 1,35 & 1,80 thousand plants/ha were significantly higher than 45000 & 90,000 plants/ha. Population levels of 1,35 & 1,80 thousand plants/ha did not show significant difference in the yield. In case of fodder, population at 1,80 thousand plants/ha gave significantly higher yield than 45,90 & 1,35 thousands plants/ha.

Increasing levels of nitrogen, increased the yield of both grain and fodder of GM. 1-5, The grain yield due to the application of 90 Kg. N/ha increased significantly over 0,30 & 60 Kg N/ha. The nitrogen levels 30 and 60 kg N/ha produced significantly higher yield over 0 Kg N/ha.

In case of fodder yields nitrogen level at 60 & 90 kg N/ha gave significantly more fodder than 0 Kg N/ha.

The interaction between plant population & level of N was not observed to be exiting.

3) Title:- Advanced dates of sowing in sorghum

Object: 1. To assess the yield potential of sorghum under different dates of sowing.
2. To study the losses caused by shootfly and the effect of carbofuran to check it.
3. To compare different varieties under early & late sown condition with M.35-1.

Year of commencement: 1976-77

Treatments: Combination of following factor.
1. Dates of planting :- Sowing during 35, 37, 39 & 40 Meteorological weeks.
2. Varieties: CSH-7 R, CSH-8R, SPV-86 and M.35-1
3. Seed treatment: with carbofuran (C1)
without carbofuran (C0)

Replications: Four (4)

Experimental design:- Randomised block design(Scattered blocks for Date of sowing.)

plot size :- Gross : 6 rows 10 M length
Net : 4 rows 8 M length.

Spacing: 45 x 15 cm.

Date of sowing:- Meteorological week : 35- 1.9.76
" 37- 15.9.76
" 39- 25.9.76
" 40- 7.10.76

Basal manuring:- 80 Kg N + 60 Kg P_2O_5 + 40 Kg K_2O/ha.

Table : 52 Effect of dates of sowing on grain & fodder yields of Jowar (q/ha)

	Dates of planting							
	1.9.76		15.9.76		25.9.76		7.10.76	
	Grain	Fodder	Grain	Fodder	Grain	Fodder	Grain	Fodder
ety								
7R	4.51	13.40	9.37	9.58	9.37	11.24	11.11	12.15
8R	3.05	12.15	10.41	9.58	9.65	7.36	10.76	10.83
86	3.33	15.62	9.93	10.83	10.20	11.66	9.99	12.56
-1	2.56	18.68	9.30	19.93	8.54	16.87	9.16	19.93
	3.40	15.30	9.79	12.50	9.44	11.80	10.28	13.90
	0.42	1.20	-	0.62	-	0.83	-	0.88
	1.24	3.55	-	1.83	-	2.44	-	2.61
ofuran treatment								
reated	3.68	16.45	10.48	13.61	9.72	12.36	11.04	14.51
ntrea- ed.	2.56	13.40	9.02	11.24	9.16	11.24	9.37	13.19
.E.	-	0.86	-	0.44	-	-	0.34	-
.D.	-	2.54	-	1.30	-	-	1.02	-

Results and discussions:

It was observed from the data presented in Table 52 that the grain and fodder yields in general were low. The grain yield obtained under the first date of sowing were low as compared 2nd, third and 4th date of sowing. These results are, however, contradictory to the previous finding. The low grain yield of 1st date of sowing were mainly due to severe

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moisture stress at heading and early grain filling stage. The plant growth was slow, weak and stunted for a long time. Panicle exsertion was poor. This could be mainly attributed to peculiar rainfall situation this year which was most unusual.

In the later dates of sowing, although there was a reduced plant population, the plants were fairly good, panicle exsertion and grain filling was also good. This could be seen from the factors like length of panicle, grain weight/panicle.

Carbofuran produced higher grain and fodder yields compared to untreated seeds.

SUMMARY:

1) Rate of Nitrogen x Entries:

The trial was conducted at central campus. Rahuri and A.R.S. Mohol.

At Rahuri 30,60 and 90 kg N /ha produced significantly more grain yield than control. Nitrogen level of 60 and 90 kg/ha also produced significantly more grain yield than 30 kg N /ha. However 60 and 90 kg N/ha were on par. The same trend was also observed in the last year.

At Mohol 90 kg N/ha produced significantly more grain yield over 0, 30 and 60 kg N/ha. However they were on par.

The new hybrid CSH-8 R produced the highest grain yield and was significantly superior to SPV-86 and M.35-1 at Rahuri. However the entries did not differ significantly at Mohol.

2 Uniform Agronomic Trial of Plant Population x Entries:

The population P_3 (1,35,000 plants/ha) and P_4 (1,80,000 plants/ha) produced 29.10 and 30.57 q/ha grain yield and were significantly superior to P_1 (45,000 plants/ha) and P_2 (90,000 plants/ha) which yielded 24.75 and 26.03 q/ha respectively.

In case of entries new rabi hybrid CSH-7 R produced the highest grain yield (30.01 q/ha) and was significantly superior to SPV-86 (26.37 q/ha) and local M.35-1 (26.17 q/ha). The hybrid CSH-8 R, SPV-86 and M.35-1 were on par. No significant difference was observed between CSH-7 R and CSH-8 R.

Grain yield did not differ significantly due to 45,000, 90,000 1,35,000 and 1,80,000 plant population/ha during the last year.

3. Experiment on Meeting Aberrant wheather Mid-season correction contin.

The treatment namely original plant population 1,80,000 + straw mulch (T_2), 1,20,000 plant population maintained by removing third row (T_4) and third plant within the row (T_5) produced 27.23, 27.06 and 26.41 q/ha grain yield respectively and were significantly superior than 1,80,000 population/ha (T_1) and 90,000 population/ha (T_3) and amongst themselves, they were on par. Original 1,80,000 plants (T_1) and 90,000 population

also superior than 90,000 plants/ha by removing alternate row (T_3).

.. Experiment on Advanced Dates of Sowing:

Suitable period for sowing to get maximum grain yield at Rahuri was observed to be first fortnight of September. The yield of entries did not differ significantly. The highest grain yield was produced by the variety SPV-86 (27.57, q/ha)

Seed treatment with carbofuran was observed to be effective.

The interactions except Dates x Entries were non significant. All entries produced more grain yield at D_2 (10-9-76) treatment than D_1 (1-9-76) and there after reduction is observed. Last year suitable period for sowing was observed to be last week of August to first week of September.

At Mohol the results were contradictory to the previous finding. This could be mainly attributed to peculiar rainfall situation this year which was most unusual.

5. Input Management study:

The highest grain yield was recorded in High input + High Management (T_1) treatment, which was followed by High input + Low Management (T_2) treatment. Treatment T_1 produced 48.47 and 49.30 % more grain yield than Low input + Low management (T_3) and low input + High management (T_4) treatments respectively. The treatment T_2 also produced 39.03 and 40.01 % more grain yield than T_3 and T_4 respectively. The net profit received from treatment T_1 and T_2 was more than double to T_3 and T_4 treatments.

During the last year improved method was superior to local method of jowar cultivation for obtaining the high grain yield.

6. Ratoon Experiment on CSH-1:

Harvesting of main crop 15 days before due date of harvest (H_1) produced the highest grain yield of ratoon crop(14.49 q/ha) and was significantly superior to 7 days before due date of harvest (H_2) and at due date of harvest (H_3) treatment. The treatment (H_2) also produced significantly more grain yield than (H_3) treatment. Last year the harvesting treatments did not differ significantly, probably due to continuous rains upto November.

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Irrigation at all stages (I_4) produced the highest grain yield (11.26 q/ha) and was significantly superior than the rest of the treatments except one irrigation one month after harvest (I_1). last year irrigation one month after harvest and at grain setting stage of ratoon crop was found beneficial. Irrigation at all stages was not included during last year.

Two tillers per shoot produced significantly superior grain yield than one tiller per shoot. Last year the same trend was observed.

7. Plant population x rates of nitrogen:

The trial was conducted at Mohol to determine the optimum plant population and dose of N for sorghum variety GM-1-5.

It was seen that, differences in the grain and fodder yields due to various plant populations were significant. The population levels of 1, 35 and 1,80 thousand plants/ha produced significantly more yield than 45,000 and 90,000 plants/ha. Population levels of 1,35 and 180 thousand plants/ha did not show significant differences in the yield.

Increasing levels of nitrogen increased the yield of both grain and fodder of the variety GM-1-5-. The grain yield due to the application of 90 kg.N/ha increased significantly over 0, 30 and 60 kg. N/h

The interaction between plant population and levels of N was not observed to be existing.

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ENTOMOLOGY - RABI

All India Co-ordinated Sorghum Improvement Project

1) a) Title — To study the effect of irrigation on the incidence of leaf sugary disease.

b) Design — Split-plot with 3 replications.

c) Sowing date — 28-9-76.

d) Plot size — 4.40 m x 1.80 m.

e) Entries — CSH-8; M-35-1.

f) Harvesting date — 31-1-1977.

Main treatments — Two.

i) Four irrigations at an interval of 25 days starting from one month after sowing.

ii) No irrigation.

Sub treatments — Three

i) Untreated

ii) 5% Carbofuran seed treatment.

iii) 0.035% endosulfan (complete control)

Results — Presented in table 53.

From the table, it can be seen that the intensity of sugary substance on leaves and plants was significantly higher in case of irrigated crop compared to unirrigated one which can be attributed to the succulent growth of the crop and high humidity conditions prevalent in irrigated plots. In case of sub-treatments, the incidence was more in control plots.

Incidence of delphacids was negligible during the period under study. Though the population of aphids was noticed on the crop both in irrigated as well as unirrigated plots it was comparatively more in the irrigated crop. No correlation, however, could be drawn between the aphid infestation and the intensity of sugary substance.

Further it was noted that the yields of grain both in CSH-8 and M. 35-1 were higher in the irrigated plots than in unirrigated ones while. The reverse trend was observed in case of fodder yields. This may be due to more deterioration of leaves.

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Table : 53 (a)

Sub-treatment / Main treatment	Average population of aphids on five plants/sq cm.						Average percentage of plants and leaves affected by sugary substance							
	A		B		C		A		B		C		Mean	
	CSH-8	M.35-1	CSH-8	M.35-1	CSH-8	M.35-1	CSH-8	M.35-1	CSH-8	M.35-1	CSH-8	M.35-1	CSH-8	M 35-
1.No irrigation	292	235	188	154	56	84	P 34.81	58.32	19.07	35.51	27.41	29.94	27.10	41.26
							L 60.83	52.38	54.25	44.71	56.04	51.55	57.07	49.55
2.Irrigation	335	262	230	196	72	98	P 58.98	63.49	53.64	41.62	48.16	62.29	52.59	55.80
							L 74.16	61.84	60.47	61.48	72.71	57.20	69.12	60.17
Mean							P 45.40	60.90	36.35	38.57	37.78	46.11		
							L 67.54	67.11	57.36	53.99	64.38	54.38		

Average of three replications

P = Plants L = Leaves

A = Control

B = Corbofuran treated

C = Complete control with endosulfan

Main- Treatments S:E		P	3.63	2.63
		L	3.59	1.60
C.D. at 5%		P	20.55	N.S.
		L	N.S.	9.67
Sub-Treatments S.E.		P	2.97	5.27
		L	2.19	1.73
C.D. at 5%		P	N.S.	17.08
		L	7.08	N.S.

Table (Continued) 5A (B)

Average yield in q/ha.

Sub treatment	A				B				C				Grain		Fodder	
Main treatment	CSH-8		M.35-1		CSH-8		M.35-1		CSH-8		M.35-1		CSH-8	M.35-1	CSH-8	M.35-1
	Grain	Fodder	Grain	Fodder	Grain	Fodder	Grain	Fodder	Grain	Fodder	Grain	Fodder				
1) No Irrigation	3162.50	3332.5	3125.0	6252.0	4857.5	4582.5	4153.7	9375.0	4016.2	3332.5	3200.0	7291.2	4012.5	3492.5	3750.0	763
2) Irrigation	3788.7	2500.0	3578.7	5625.0	5182.5	3750.0	4957.5	7707.5	4466.2	2916.2	4297.5	5625.0	4480.0	4277.5	3055.0	631
Mean	3475.0	2916.2	3362.0	5937.5	5020.0	4166.2	4556.2		4241.2	3125.0	3748.7					

Main-treatment	S.E.	61.25	54.00	0.103	2.5
	C.D. at 5%	306.25	268.75	N.S.	N.S
Sub-treatment	S.E.	207.50	188.75	175.0	362.
	C.D. at 5%	672.50	608.75	566.25	117

a) Co-ordinated Trial No.8 : Pest incidence in ratoon crop.

b) Object : To determine the relative damage due to major pests on the main and ratton crops and to estimate the losses caused by each pest.

c) Design : R.B.D. with four replications

d) Plot size : 4.5 m x 3 m.

e) Hybrid : CSH-5

f) Sowing date : 29-6-1976

g) Pate of harvest of main and ratoon crops : 14-10-1976 and 4-2-1977

h) Results : Presented in Table 53 (c) and (d)

Table 53 (c.) Ratton crop:

Sr. No.	Shootfly		Stem borer		Yield in kg/ha	
	Av. % age dead hearts	Arcsin values	Av.% age dead hearts	Arcsin values	Grain	Fodder
Protected						
1	2.92	9.81	15.00	22.79	4162.94	7407.40
2	3.04	9.98	13.75	21.72	4340.72	8146.14
3	3.57	10.94	12.50	20.70	4385.18	7407.40
4	3.73	11.09	11.25	19.55	4474.06	5103.60
Unprotected						
5	20.08	26.64	38.75	38.47	1792.58	3140.72
6.	23.51	29.00	35.00	36.37	2933.32	3881.46
7	22.53	28.11	37.50	37.76	2044.44	3881.46
8.	23.96	29.33	35.00	36.27	2288.88	3140.72
S.E.		2.24		4.04	592.58	444.44
C.D.		6.56		11.84	1733.32	1288.88

Table 53 (d):

Treatment	Av. % age dead hearts due to shootfly	Av. % age dead hearts due to stem borer	Av.grain yield in kg/ha	Av.fodder yield in kg/ha	Loss due to pest in kg/ha	
					Grain	Fodder
Protected	3.31	13.12	4340.72	7266.65	1825.92	3705.51
Unprotected	22.52	36.56	2514.80	3511.09		

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The data indicated that the damage caused by shoot fly and stem borer was relatively more in the unprotected plots. Than in the protected ones. Likewise yields obtained in the protected plots were higher than in the unprotected plots. The losses observed due to shootfly and stem borer was to the extent for the ratoon crop 1825.92 kg/ha and 3755.56 kg/ha of grain and fodder respectively. The percentage loss due to the pests was observed to be and 42.0 and 51.60 (ratoon crop) for grain and fodder respectively.

a) Co-ordinated Trial No.1 : Evaluation of breeders material in advance yield trial for resistance to shootfly and stem borer.

b) Object : To determine relative susceptibility of Sorghum lines in advance yield trials to major pests.

c) Design : R.B.D. with four replications

d) Plot size : Single row, 3 m. long

e) Entries : 61

f) Date of sowing : 11-9-1976.

Table 54 Reletive susceptibility of sorghum lines to major pests:

Sr. No.	Sorghum lines	Average perdentage of shootfly incidence	Average percentage of stem borer incidence
1	2	3	4
1.	SPV-86 (91-1)	47.71	37.53
2.	SPV-86 (91-2)	51.65	34.84
3.	SPV-86 (91-3)	42.15	47.56
4.	SPV-86 (91-4)	44.53	38.39
5.	SPV-86 (91-5)	51.34	34.15
6.	SPV-86 (91-6)	46.22	55.48
7.	SPV-86 (91-7)	40.72	36.82
8.	SPV-86 (91-8)	53.78	38.50
9.	SPV-139	56.17	46.20
10.	SPV-140	65.63	45.97
11.	SPV-102	70.62	45.47
12.	SPV-115	47.63	26.79
13.	SPV-41	41.54	51.06
14.	SPV-42	44.62	34.87
15.	SPV-43	57.43	32.00
16.	SPV-50	50.89	39.50
17.	SPV-51	54.25	38.84
18.	SPV-53	68.15	-
19.	SPV-54	93.33	-
20.	SPV-80	62.49	39.36
21.	CSV-7 R	47.67	40.92
22.	SPH-33	50.13	41.21
23.	SPH-47	56.24	46.41
24.	SPH-49	70.98	45.51
25.	SPH-62	53.57	33.81

1.	2.	3.	4.
26.	SPH-67-2	55.52	39.53
27.	CSH-1	60.37	29.05
28.	CSH-5	58.38	31.58
29.	CSH-6	58.87	36.62
30.	CSH-7 R	56.00	37.45
31.	CSH-8 R	64.71	34.12
32	SPV-81	57.41	35.41
33.	SPV-95	54.93	26.07
34.	SPV-122	64.86	19.64
35.	SPV-123	62.43	38.92
36.	SPV-124	75.36	39.86
37.	SPV-131	65.50	34.24
38.	SPV-137	56.71	35.10
39.	SPV-138	56.25	26.43
40.	SPV-141	50.49	50.18
41.	SPV-143	62.11	47.42
42.	SPV-144	41.52	48.68
43.	SPV-145	52.39	37.13
44.	SPV-146	62.20	38.23
45.	SPV-147	61.61	35.02
46.	SPV-148	55.74	29.53
47.	SPV-149	50.96	40.52
48.	SPV-150	51.27	49.20
49.	SPV-155	60.51	30.90
50.	SPV-153	50.16	36.87
51.	SPV-154	61.62	42.35
52.	SPV-15	62.08	55.98
53.	2077 B	60.11	36.84
54.	2219 B	52.77	30.28
55.	36 B	54.88	35.17
56.	296 B	57.84	33.39
57.	3660 B	51.71	40.14
58.	CS -3541	44.43	51.78
59.	16B	45.50	30.13
60.	PD-3-1-11	48.60	43.94
61.	M-35-1	22.20	35.52

Of the 61 sorghum lines tested only M-35-1 was found to be relatively less susceptible to the attack of shootfly where in the damage due to the pest was 22.20 per cent while in rest of the lines the damage was comparatively more. In the case of stem borer the entries SPV-122, SPV-95, SPV-138 and SPV-115 were found to show some promise where in the damage was to the extent of 19.64 to 26.79 per cent.

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a) Co-ordinated Trial : Incidence of insect pests, especially the shootfly on early sown rabi crop.

b) Object : To assess the relative pest incidence, especially the shootfly, in the early sown crop as compared to the crop sown on normal date during rabi season.

c) Desing : R.B.D. with four replications

d) Plot size : 4.5 m x 3 m.

e) Entries : CSH-5 and CS-3541

f) Harvesting dates : 22-12-76; 4-1-77; 4-1-77; and 11-1-77.

g) Results : Presented in table 55.

Table 55 Incidence of shootfly in early sown rabi crop:

Sowing date	Average % age of dead hearts due to shoot fly		Yield Grain in kg/ha		Yield fodder in kg/ha	
	CSH-5	CS-3541	CSH-5	CS-3541	CSH-5	CS-3541
18-8-76	58.96	59.32	2777.77	1940.73	4407.40	3422.21
29-8-76	53.79	52.77	3014.81	2037.03	4777.77	3792.58
8-9-76	36.61	33.13	4192.58	3407.40	6014.80	4718.51
18-9-76	43.73	46.25	3629.62	2407.40	5274.06	3888.88
S.E.	2.24	3.39	151.85	140.74	125.92	125.92
C.D.	7.17	10.80	466.66	444.44	377.77	377.77

The observations indicated that the shootfly incidence was relatively more in the crop sown on 18-8-76 and 29-8.76 (advance sowing) as compared to the crop sown onnormal date (8-9-76). The grain and fodder yields obtained were also relatively less only in the crop sown on advanced dates. This is mainly because of higher incidence of shootfly during this period.

a) Co-ordinated Trial No.5 : Evaluation of some systemic and contact insecticides for the control of sorghum shootfly.

b) Object : To find out suitable altarnative for carbofuran seed treatment and other effective granular insecticides.

c) Design : Split plot with eight main treatments, two sub-treatments, and four replications.

d) Plot size : 3 x m 4.5 m

e) Hybrid : CSH-1

f) Sowing date : 3-11-1976.

g) Results : Presented in Table 56.

Table- 56 Insecticid l trial for thecontrol of sorhgum shootfly:

Sr. No.	Sub-treatment Main treatment	Average % age dead hearts A	Average % age dead hearts B	Arcsin values A	Arcsin values B	Mean
1.	Carbofuran 5% seed treatment	11.50	10.28	19.23	18.69	19.21
2.	0.05% phosalone	48.20	42.80	43.96	40.87	42.41
3.	0.03% endosulfan	47.44	44.01	43.53	41.56	42.55
4.	0.05% quinalphos	57.04	54.23	29.05	47.38	48.22
5.	0.05% leptophos	64.08	58.55	53.32	49.96	51.64
6.	0.05% phenthoate	63.55	62.08	52.99	52.04	52.51
7.	0.03% methytdemeton	66.62	59.70	54.74	50.51	52.63
8.	Control	72.11	70.08	58.18	57.34	57.76
	Mean	53.82	50.18	46.94	44.79	-

Main treatment	SE	1.66
	CD	4.86
Sub-treatment	SE	0.380
	CD	1.091

Average of four replications

A = Two sprays at 5 and 12 days after germination

B = Three sprays at 5, 10 and 18 days after germi-nation.

N.B. i) Diazinon was not available hence carbofura was used.

ii) Yield data would be report in due course of time as crop has not yet been harvested.

The results indicated that the treatment with 5 per cent carbofuran seed treatment was the most effective and significantly superior to rest of the treatments in minimising the pest incidence. Treatment with 0.05% phosalone was the second best which however, was ound to be on par with 0.03% endosulfan. No. significant difference was bserved amongst rest of the treatments.

As regards the effecacy of the number of sprays it was observed hat three sprayings were significantly superior to two spreys in reducing he pest incidence.

) Co-ordinated Trial No.7: Studies on storage of carbofuran treated seeds.

) Object : i) To study the effect of carbofuran seed treatment on the germination of treated seed after different periods of storage.

ii) To study the effect of storgge of carbofuran treated seed on the efficacy against shootfly.

A filler experiment was conducted on the efficacy of carbofuran reated seeds stored for different periods. The results are presented in able 58 and 59.

able 58 Effect of carbofuran seed treatment on the germination of treated seeds after different periods of storages:

r. lo.	Treatments (Treated seeds with 5 parts of carbofuran/100 parts of seed)	Per cent germination (Treated)		Percent germination (untreated)	
		CSH-5	CS-3541	CSH-5	CS-3541
.	Freshly treated seeds	95.00	94.00	96.00	96.00
.	1 month old	91.00	93.00	95.00	96.00
.	2 months old	80.00	86.00	94.00	96.00
.	3 months old	80.00	82.00	90.00	92.00
.	4 months old	72.00	76.00	91.00	89.00
.	5 months odl	65.00	63.00	90.00	87.00
.	6 months old	61.00	60.00	85.00	81.00

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Table 59 Efficacy of carbofuran treated seeds for the control of shoot fly after storage for different periods:

Sr. No.	Month	Treatment(seeds treated with 5 parts of carbofuran per 100 parts of parts of seed)	Average percentage dead heart due to shoot fly			
			CSH-5		CS-3541	
			Treated	Untre-ated.	Treated	Untre
1.	June	Freshly treated seeds	1.50	33.00	5.00	35.50
2.	August	Two months old	16.50	76.50	20.50	56.50
3.	October	Four months old	8.50	53.50	15.50	39.50
4.	December.	Six months old	25.00	59.00	22.50	42.50

It could be seen from the table 1 and 2 that the carbofuran treated seeds stored for about three months did not adversely affect the germination of seeds. However, the germanation was greatly affected in case of treated seed which was stored for 4, 5 and 6 months.

As regards its efficacy against shoot fly it was noticed that it does not loose its efficacy for 6 months period, though apparently there was slightly more dead hearts in treated seeds stored for 2 months and six months which may be due to presence of high shootfly population level at the time of sowing i.e. August and December. Sowing. However, next year one would be taken to sow freshly treated seed along with the sowings of stored seeds.

SUMMARY:

During the year under report five co-ordinated trials viz. (1) Pest incidence in ratoon crop (2) Evaluation of breeders material in advanced yield trial for resistance to shootfly and stem borer (3) Incidence of insect pest, especially the shootfly on early sown rabi crop (4) chemical control of shootfly and (5) Effect of storage of carbofuran treated seeds on germination and its efficacy were conducted.

In all the trials the crop was sown at normal time and thinning was done to maintain the required population of the plants. Usual observations were recorded as per the procedure given for the major pests.

Trial No. 8: In respect of the pest incidence in main and ratton crop the losses observed due to shoot fly and stem borer was to the extent of 3185.18 kg/ha and 4592.65 kg/ha of grain and fodder respectivel for the main crop while for the ratoon crop the losses were 1825.9 and 3755.56 kg/ha of grain and fodder respectively.

Trial No.1: Of the 61 sorghum lines only M-35-1 was found to be relativel less sueceptible to the attack of shoot fly. In the case of stem borer the entries SPV-122, SPV-95, SPV-138 and SPV-116 were found to be promising.

Trial No. 9: The shoot fly incidence was relatively more pronounced only in crop sown on 18-8-76 and 29-8-76 (advance sowing) as compared to the crop sown on normal date (8-9-76).

Trial No. 5: In respect of the chemical control of shoot fly the seed treatment with 5 per cent carbofuran was the most promising. As regards the efficacy of the number of sprays three sprayings wer found to be singificant in reducing the pest incidence.

Trial No.2: Jowar seed treated with 5 parts of carbofuran (a.i.) and stored for 6 months does not losses its efficacy against shoot fly and its germination is affected when 4,5 and 6 months old seed were sown for the test.

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PART - II

(Work Proposed for 1977-1978)

A) Plant Breeding

I) Sorghum Improvement Project, Central Campus, Rahuri.

1. Maintenance of Male sterile Lines
2. Transference of Male sterility programme by direct and indirect method.
3. Selections of superior varieties and restorers from the segregating generations of Exotic x Indian Crosses.
   i) For shootfly tolerance
   ii) For Midgefly tolerance/resistance
   iii) For quality characters like high protein and lysine
   iv) For grain mold and leaf spot resistance/tolerance.
4. Comparison of different cytoplasms for their reaction to pest tolerance and quality characters.
5. Preliminary yield trials of derivatives from different crosses.
6. Priliminary and large scale trials of new hybrids.
7. Production of breeder seed of different male steriles for further use in hybridization.
8. Breeder seed multiplication of parents of all parents of all release hybrids and high yielding varieties.
9. Programme of AICSIP trials.
10. Maintenance and evaluation of germplasm.

II) Agril. Research Station Mohol

A) Sorghum yield Trials - The following sorghum yield trials will be carriedout during rabi season- 1977-78

Station Trials :

1) Preliminary sorghum yield trial
2) Small scale sorghum yield trial
3) Large scale sorghum yield trial

Regional Trials :

1) Large scale sorghum varietal trial (Parabhani)
2) Small scale sorghum hybrid varietal trial (Parabhani)

Coordinated trials (AICSIP):

1) Advanced sorghum hybrid trial
2) Advanced sorghum varietal trial
3) Preliminary sorghum hybrid trial
4) Sorghum parental line trial

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B) Hybridization : i) Effecting crosses between Indian x Derived lines for improving yield, grain quality and tolerance to shootfly.

ii) A programme of breeding for tolerance to midge fly will be taken-up.

iii) Combining ability studies in L x T programme : To incarporate earliness, grain quality, shootfly tolerance, drought tolerance in rabi sorghum varieties.

2) i) Combining ability studies in L x T programme : To study the nature of combining ability for grain yield and its components of promising Ms lines.

Ms lines : 36A, 2077A, 1202A, 4 RA.

Tester lines : 168, CS.3541, PD-3-1-11, 1235, 302, 285, IS. 84, FR-493, 329.

ii) Back cross programme will be taken-up for the development of new male steriles for rabi season.

iii) Hybrid seed of promising hybrid combinations will be produced Besides, new hybrid combinations will also be produced for further exploitation.

Ms Lines	Promising male parents
36A,3660A,2077A,2219A, 418A, 3677A, 2947A, 1202A, 296A.	285, 296, 329, 370, PD-2-5, PD-2-3-1-11, 168, CS. 3541, 358, 1235,CS. 3687, CS. 3560 IS. 84, FR-493.

3) Growing of F_1's :- The crossed seeds obtained from the various crosses under project-1,2,3 and 4 will be planted in the F_1 generation in rabi-77 for further study.

4) Growing of F2's :- The successful individual plants obtained from 66 crosses (F1's) will be studied in F2 generations for further selections.

5) Growing of F3's : The desired recombinations selected from the F2 population of 25 crosses (10+15) will be studied in F3 alongwith std. check lines and the promising cultures/lines will be selected for utilizing in the further breeding programme.

6) Growing F4's : The twenty promising cultures selcted from f3 populations during rabi-76 will be tested for their yield performance alongwith std. check.

C) Nicking studies in parents of promising hybrids to study the flowering behaviour of the parents will be under taken.

D) Germplasm Collection :- Sorghum germ plasm collection available at the station will be planted, studied for its genetic purity and will be maintained for further exploitation.

102/-

E) Studies on striga Resistance :- The work of screening promising breeding material for striga resistance will be continued.

F) Seed Production: Breeders seed of M. 35-1, CS-3541 and other useful lines from germplasm collection will be produced to produced provide the source for the initial and recurring increasing of foundation seed.

B) AGRONOMY:

A) Experiments to be continued:

Name of the experiment	Location
1) Advanced dates of sowing on sorghum	Rahuri & ARS Mohol
2) Rates of nitrogen x Entries	- do -
3) Plant density studies	Rahuri
4) Meeting aberrant weather mid season correction contingency experiment	Rahuri
5) Input x Management Interaction study.	Rahuri
6) Ratoon experiment on CSH-1 or CSH-5	Rahuri.
7) Leaf sugary disease trial on sorghum	Rahuri.
8) Plant population x rates of nitrogen variety G.M.1-5	A.R.S. Mohol

B) New proposed experiment to be conducted during the year 1977-78:

I) i) Fertilizer management of nitrogen in sorghum (fertilizer use efficiency). CSH-8 R.

ii) Location: Agril Research station Mohol and chas.

iii) Treatments : 8

a) Levels of Nitrogen : 4

(0, 20, 40 and 60 kg N/ha)

b) Method of application : 2

i) Broad casting before sowing and mixing in the soil.

ii) Fertilization in the set furrow (opened by the country plough by drilling with the seed disc).

iv) Design : R.B.D.

v) Replications : 4

vi) Plot size : Gross : 10.0 m x 3.6 m = 36.0 m^2

Net : 8.0 m x 2.7 m = 21.0 m^2

1) Experiments given by Technical project Leader-Sorghum Entomologist IARI

2) Chemical control of delphacides and aphids, as discussed during ~~ap~~ special meeting at 8 th December 1976.

3) Effect of Date of sowing on incidence of shootfly Locations (1) - Rahuri 2) Mohol 3) Digraj.

4) Trial suggested by sorghum Breeder Paraphani Effect of irrigation on incidence of sugary disease.

5) Screering of breeders material in advance generations for registance against shootfly.

II. Agricultural Research Station Mohol:

1) Effect of date of sowing on incidence of shootfly.

III) Agricultural Research Station Digraj:

1) Effect of date of sowing on incidence of shootfly.

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ANNUAL REPORT OF MAIZE, 1976-77

ALL INDIA CO-ORDINATED MAIZE IMPROVEMENT PROJECT,

SUB CENTRE, GRAMSEVAK TRAINING CENTRE, KOLHAPUR: 3.

INTRODUCTION :

Maize (Zea mays L.) is an important cereal crop of India with vast industrial potentialities. Over 85 per cent of the production is used directly as human food and 15 per cent for industrial uses like poultry and cattle feed, starch, glucose, alcoholes, syrops, acids and many other chemicals and medicines. In Maharashtra the maize occupies an area of 50,000 ha with the total production of 41,000 tonnes.

Under the All India Co-ordinated Maize Improvement Project, the sub-centre, Kolhapur is started with Breeding, Agronomy and Entomology disciplines, with the following objectives.

1) To test new hybrids, composites, synthetics developed by different centres and breeding work to develop superior varieties for the State.

2) To findout the optimum package of practices for new maize varieties.

3) To screen out the new maize strains against the important pests and diseases and to find out suitable chemical control measure.

SEASON AND CLIMATE :

The kharif season was not satisfactory for the maize crop. The growth of the crop was very poor due to continous rains and water logging conditions in the month of July and August. Due to these conditions some of the trials were vitiated and growth of the crop in many trials was affected. The incidance of leaf blight was less as compared to the last year. There was negligible damage due to stem borer (Chilo partellus, S)

PART : I

WORK DONE DURING THE YEAR 1976-77

Following experiments were conducted in the Breeding, Agronomy and Entomology disciplines.

A) BREEDING SECTION

KHARIF TRIALS

Trial No. 41 to 45 : Full-sib progenies (second cycle) of Hunis Composite.

1) Object : To test the performance of the 225 full sib progenies of Hunis composite.
2) Year : 1976-77 Kh.
3) Design : R. B. D.
4) No. of entries : 245
5) Replication : Two
6) Net plot size : 0.75 x 5.0 mt.
7) Fertilizers/ha. : 120 Kg N + 60 Kg P205 + 35 Kg K20

Table 1 - Performance of promising progenies of Hunis

Sr. No:	Pedigree	Days to 75% silk	Yield in Kg/ha.	Rank
Trial No. 41				
1.	F.S. 1	53	3629	4
2.	F.S. 3	56	3889	2
3.	F.S. 5	54	3628	5
4.	F.S. 33	59	3707	3
5.	F.S. 41	54	4222	1
6.	Local (Check)	51	2685	24
7.	Hunis (Ori) (Check)	60	2212	41
		C. D. at 5%	1532	
Trial No. 42				
1.	F.S. 50	55	3208	2
2.	F.S. 53	60	3525	1
3.	F.S. 61	56	2671	4
4.	F.S. 67	56	2647	5
5.	F.S. 68	56	3147	3
6.	Local (check)	51	1753	27
7.	Hunis (Ori) (check)	66	1995	19
		C.D. at 5%	1517	

..3/-

1.	2.	3.	4.	5.
Trial No. 43				
1.	F.S. 100	58	2936	5
2.	F.S. 115	59	4388	1
3.	F.S. 117	58	2988	4
4.	F.S. 126	58	3065	3
5.	F.S. 127	55	3161	2
6.	Local (check)	56	1531	41
7.	Hunis (Ori) (check)	58	2645	10
		C.D.at 5%	1605	
Trial No. 44				
1.	F.S. 143	57	4149	2
2.	F.S. 155	58	3922	3
3.	F.S. 168	55	3652	5
4.	F.S. 172	59	3739	4
5.	F.S. 173	56	4488	1
6.	Local (check)	53	1592	47
7.	Hunis (Ori) (check)	60	1872	42
		C.D.at 5%	2071	
Trial No. 45				
1.	F.S. 187	61	3572	5
2.	F.S. 199	60	3609	4
3.	F.S. 212	57	3620	3
4.	F.S. 215	55	3854	1
5.	F.S. 222	56	3805	2
6.	Local (check)	53	1591	49
7.	Hunis (ori) (check)	60	2312	35
		C.D.at 5%	1240	

CONCLUSIONS :

Performance of 225 full-sib progenies were tested in five trials with the checks local, Hunis (Ori), Ganga-5 and, Vijay. Out of 225 progenies, 19 were statistically superior over the check local and given 100 to 140% higher grain yield. Other 17 progenies have also yielded 40 to 60% more grain yield than local. All these progenies were comparable with local for maturity.

..4/-

Trial No. 63 - Medium maturing yellow hybrids :

1. Object : To test the performance of medium maturing yellow hyorids.
2) Year : 1976-77 Kh.
3) Design : R. B. D.
4) Replication : Four
5) No. of entries : 40
6) Net plot size : 1.5 x 8.0 mt.
7) Fertilizers/ha. : 120 Kg N + 60 Kg P205 + 35 Kg K20.

Table - 2 - Performance of promising hybrids :

Sr. No.	Pedigree	Days to 75% silk	Yield in Kg/ha.	Rank
1.	MMH-5	67	3892	1
2.	EH 400575	63	3825	2
3.	J.604xExp10-5 -#-#-#-#-#	64	3817	3
4.	EH 200174	66	3799	4
5.	(CM202xCM211) x TAD-12-#-#-#-#-#	65	3776	5
6.	Local (check)	53	1610	40
7.	Ganga-5 (check)	69	2919	32
8.	Vijay (check)	69	3609	6
9.	Deccan (check)	72	3047	24
		C.D. at 5%	818	

CONCLUSIONS :

The results were significant. Out of 40 entries, entry No. 1 (MMH5) has given statistically 27% more grain yield than the check Deccan. The entry No 2, 3, 4, and 5 were also found promising.

Trial No. 65 - Medium maturing composites

1) Object : To test the performance of medium maturing composites.
2) Year : 1976-77 Kh.
3) Design : R. B. D.
4) Replication : Four
5) No. of entries : 42
6) Net plot size : 1.5 x 8.0 mt.
7) Fertilizers/ha. : 120 Kg N + 60 Kg P205 + 35 Kg K20.

...5/-

Table - 3 : Performance of promising composites :

Sr. No.	Pedigree	Days to 75% silk	Yield in Kg/ha.	Rank
1.	HP-99	62	2484	1
2.	Varietal Cross-80-##-##	71	2430	2
3.	Syn B-21	72	2314	3
4.	Syn B-31	71	2259	4
5.	Local (check)	51	1074	42
6.	Vijay (check)	72	2074	11
7.	Ganga-5 (check)	72	1923	18
8.	Kisan (check)	73	2251	5
		C.D. at 5%	584	

CONCLUSIONS :

Out of 42 entries, entry No. 1 (HP-99) has given highest yield (2484 Kg/ha) and 15 days earlier than the check Vijay (2074 Kg/ha), however it was on par with Vijay. The entry Nos. 2, 3, 4 were also observed promising.

Trial No. 72-73 : Introduction top crosses :

1) Object : To study the performance of top crosses.
2) Year : 1976-77 Kh.
3) Design : R. B. D.
4) Replication : Two
5) No. of entries : 98
6) Net plot size : 1.50 x 8.0 mt.
7) Fertilizers/ha. : 120 Kg N + + 60 Kg P205 + 35 Kg K20 .

...6/-

Table - 4 : Performance of promising top crosses :

Sr. No.	Pedigree		Days to 75% silk	Yield in Kg/ha.	Rank
Trial No. 72					
1.	(DT46xDT24),(M5190 xSyn607)	X (Pr.gr.I. 116xFLA-3 H94)	68	6383	1
2.	DT.46xDT34,MR.90 xV.305	X - do -	67	5777	3
3.	Amarillo Baga	X - do -	71	5661	4
4.	MR I	X - do -	70	5592	5
5.	Ganga-5 (check)	X - do -	74	4750	19
			C.D.at 5%	1331	
Trial No. 73					
6.	Jawahar Syn.xThia comp.1DMR BC2(F1)	X - do -	71	7858	1
7.	J1xSyn.Thia comp. 1DMR BC-2(F1)	X - do -	72	7685	2
8.	(Guatant Gr.2)x (Thia comp.≠≠1DMR BC.2(F2).	X - do -	74	6922	3
9.	Neelam f5 72L	X - do -	71	6852	4
10.	A2 comp.F5 72L	X - do -	73	6822	5
11.	Ganga-5 (check)		72	6060	17
			C.D.at 5%	1645	

CONCLUSIONS :

Out of 98 top crosses including four checks, the entry No 1 and 6 have given significantly 30% and 33% more yield than the check Ganga-5 respectively. The remaining above mentioned entries were also found promising.

Trial No. 101 : Medium maturing composites and synthetics

1) Object : To test performance achieved by medium maturing composites and synthetics.

2) Year : 1976-77 Kh.

3) Design : R. B. D.

4) Replication : Four

5) No. of entries : 32

6) Net plot size : 1.5 x 3.0 mt.

7) Fertilizers/ha. : 120 Kg N + 60 Kg P205 + 35 Kg K20.

...7/-

Table - 5 : Performance of promising composites and synthetics .

Sr. No.	Pedigree	Days to 75% silk	Yield in Kg/ha.	Rank
1.	H-1	64	6775	2
2.	Comp. B V	61	6608	3
3.	Manjri composite	62	6185	5
4.	Local (check)	57	2554	31
5.	DHM-101 (check)	63	7290	1
6.	Vikram (check)	63	5366	17
7.	Vijay (check)	64	6193	4
		C.D. at 5%	1732	

CONCLUSIONS :

Out of 32 ntries, onone of the entries was found significantly superior over the check, Vijay, H-1, Composite B-V and Manjri composite were found promising.

Trial No. 102 : Early maturing composites and synthetics :

1) Object : To study the performance of early maturing composites and synthetics.
2) Year : 1976-77 Kh.
3) Design : R.B.D.
4) Replication : Four
5) No. of entries : 15
6) Net plot size : 1.5 x 8.0 mt.
7) Fertilizers/ha. : 120 Kg N + 60 Kg P205 + 35 Kg K20.

Table - 6 : Performance of promising composites and Synthetics.

Sr. No.	Pedigree	Days to 75% silk	Yield in Kg/ha.	Rank
1.	H-3	57	5896	1
2.	Syn B-19	54	5511	3
3.	Syn B-23	59	5043	4
4.	Syn B-30	60	4935	5
5.	Hunis	53	4366	9
6.	Local (check)	52	1222	15
7.	DHM-101 (check)	53	5666	2
		C.D. at 5%	2192	

CONCLUSIONS :

Out of 15 entries, all entries except entry No. 12 (43772f4) were found statistically superior over the check local. Entry No. 1 to 5 found most promising, however, growth of the crop was very poor in this trial.

Trial No. 106 to 110 : Full-sib progenies (second cycle) of Manjri Composite.

1) Object : To test the performance of 225 full-sib progenies of Manjri Composite.
2) Year : 1976-77 Kh.
3) Design : R.B.D.
4) Replication : Two
5) No. of entries : 245
6) Net plot size : 0.75 x 5.0 mt.
7) Fertilizers/ha. : 120 Kg N + 60 Kg P205 + 35 Kg K20.
8) Locations : Two (Kolhapur and Poona).

Table - 7 : Statement of promising progenies of Manjri composite.

Sr. No.	Pedigree	Days to 75% silk Kop.	Pn.	Yield in Kg/ha. Kop.	Rank	Poona	Rank
Trial - 106							
1.	F.S. 1	65	64	4477	4	5080	24
2.	F.S. 2	65	64	5410	1	6387	3
3.	F.S. 4	65	66	5173	2	5732	10
4.	F.S. 5	66	64	4351	5	5758	9
5.	F.S. 9	69	64	2849	30	6860	1
6.	F.S. 32	66	64	3096	20	6488	2
7.	Manjri comp.(check)	68	65	2923	28	5023	26
8.	Vijay (check)	71	65	1995	48	5538	13
		C.D. at 5%		1537		1528	
Trial - 107							
1.	F.S. 47	66	67	5033	5	5525	9
2.	F.S. 50	66	67	4243	17	5996	4
3.	F.S. 54	69	64	4667	10	6832	1
4.	F.S. 76	65	65	5782	1	5171	15
5.	F.S. 77	65	66	5601	2	4904	24
6.	F.S. 79	68	66	5465	3	5107	17
7.	F.S. 85	66	66	4971	7	6618	3
8.	F.S. 89	67	66	4396	14	6763	2
9.	Manjri comp. (check)	69	71	3800	25	4735	26
10.	Vijay - (check)	72	69	2862	46	4297	35
		C.D. at 5%		2034		1884	

1.	2.	3.	4.	5.	6.	7.	8.
Trial - 108							
1.	F.S. 102	64	69	9770	1	6222	3
2.	F.S. 108	67	66	4557	3	5395	19
3.	F.S. 110	69	66	3980	10	6260	2
4.	F.S. 111	71	65	2382	41	6925	1
5.	F.S. 124	66	65	4296	5	6139	4
6.	F.S. 125	66	66	4759	2	5759	10
7.	F.S. 126	70	71	4538	4	5680	13
8.	Manjri comp(check)	72	65	3301	29	4968	27
9.	Vijay (check(	72	68	3653	18	4846	30
		C.D. at 5%		1451		2116	
Trial - 109							
1.	F.S. 149	65	64	4988	2	6232	14
2.	F.S. 151	63	65	4944	3	4995	33
3.	F.S. 161	67	67	5681	1	5502	25
4.	F.S. 164	71	64	4007	17	7918	1
5.	F.S. 165	72	64	3408	32	7631	3
6.	F.S. 168	68	65	4880	4	7897	2
7.	F.S. 171	70	70	4036	16	7379	5
8.	F.S. 173	70	67	4367	11	7510	4
9.	Manjri comp(check)	74	66	1736	48	4654	41
0.	Vijay (check)	75	69	3243	35	5456	26
		C.D. at 5%		2311		2226	
Trial - 110							
1.	F.S. 198	69	68	5658	1	5394	22
2.	F.S. 200	69	68	3612	25	7254	3
3.	F.S. 204	70	65	4795	3	4783	34
4.	F.S. 208	71	67	5201	2	5649	17
5.	F.S. 210	69	67	4513	10	7052	5
6.	F.S. 213	73	69	3463	31	7167	4
7.	F.S. 215	71	65	3313	34	7356	2
8.	F.S. 218	71	68	3939	19	7970	1
9.	Manjri comp(check)	75	68	3281	36	4385	41
0.	Vijay (check)	76	70	2718	44	4993	32
		C.D. at 5%		1861		1782	

CONCLUSIONS :

Performance of 225 full-sib progenies of Manjri composite was tested in five trials at Kolhapur and College of Agriculture, Poona with the four checks. Out of 225 progenies, 26 were found statistically superior and yielded 10 to 15% higher grain yield and 10 days earlier than the check Vijay. Other 20 progenies were also observed promising.

...10/-

Trial No. 199 : Composites and Experimental varieties :

1. Object : To study the performance shown by composites and experimental hybrids.
2. Year : 1976-77 Kh.
3. Design : R.B.D.
4. Replication : Three
5. No. of entries : 19
6. Net plot size : 1.5 x 3.0 mt.
7. Fertilizers/ha. : 120 Kg N + 60 Kg P2O5 + 35 Kg K2O.

Table - 8 : Promising composites and experimental variety

Sr. No.	Pedigree	Days to 75% silk	Yield in Kg/ha.	Rank
1.	Manjri E.V.F1(QFS2)	71	3767	1
2.	Manjri E.V.F1(IFS2)	68	3019	3
3.	Manjri composite	72	2685	5
4.	Local (check)	57	1557	16
5.	Vijay (check)	71	3384	2
6.	Deccan (check)	73	2821	4
		C.D. at 5%	1158	

CONCLUSIONS :

In this trial, entry No Manjri (QFS2) composite has given highest yield, which is 11% more than the check Vijay However, it was on par with Vijay.

Trial No. 203 : F.A.O. Introduction :

1. Object : To test the performance of F.A.O. Introduction.
2. Year : 1976-77 Kh.
3. Design : R.B.D.
4. Replication : Four
5. No. of entries : 12
6. Net plot size : 1.5 x 3.0 mt.
7. Fertilizers/ha. : 120 Kg N + 60 Kg P2O5 + 35 Kg K2O

CONCLUSIONS :

Out of tweleve entries, none of the entry was found significantly superior over the check.

TRIAL No. 401, 402, 403 and 406 : Full-sib progenies of Composite B VI .

1) Object : To study the performance of full-sib progenies of composite B VI.

2. Year : 1976-77 Kh.

3. Design : R.B.D.

4. Replication : Two

5. No. of entries : 167

6. Net plot size : 0.75 x 8.0 mt.

7. Fertilizers/ha. : 120 Kg N + 60 Kg P2O5 + 35 Kg K2O

Sr. No.	Pedigree	Days to 75% silk.	Yield in Kg/ha.	Rank
Trial No. 401				
1.	F.S. - 2	67	8597	5
2.	F.S. - 11	69	9426	2
3.	F.S. - 14	65	8763	3
4.	F.S. - 21	67	8610	4
5.	Comp. B VI (Ori) (check)	69	6983	16
6.	Vijay (check)	71	6791	20
		C.D. at 5%	3267	
Trial No. 402				
1.	F.S. - 46	65	7872	2
2.	F.S. - 49	69	7056	5
3.	F.S. - 80	69	7081	4
4.	F.S. - 87	70	7906	1
5.	Comp. B VI (Ori) (check)	67	5144	24
6.	Vijay (check)	73	5298	22
		C.D. at 5%	3199	
Trial No. 403				
1.	F.S. - 92	65	7099	2
2.	F.S. - 98	66	7194	1
3.	F.S. - 99	66	6737	3
4.	F.S. - 111	69	6620	4
5.	F.S. - 116	70	6533	5
6.	Comp. B VI (Ori) (check)	70	4683	26
7.	Vijay (check)	73	4196	33
		C.D. at 5%	2603	
Trial No. 406				
1.	F.S. - 142	69	5769	2
2.	F.S. - 144	71	5294	5
3.	F.S. - 147	71	5332	4
4.	F.S. - 149	72	5611	3
5.	Comp. B VI (Ori) (check)	72	4223	13
6.	Vijay (check)	71	4717	8
		C.D. at 5%	2471	

CONCLUSIONS :

Performance of 151 full-sib progenies of composite B VI were tested in four trials, with the four checks. Out of 151 progenies, two were statistically superior and given 43% higher grain yield than the check Vijay. Other 15 progenies were promising and yielded 20 to 40% more grain yield and 10 days earlier than the check Vijay.

Advance trial (medium) :

In this trial, seven entries were tested in four replications. The results were significant. Out of seven entries, Manjri composite has given highest yield (3662 Kg /ha), but it was found on par with the best check DHM-101 (3330 Kg/ha), Syn B 21 was also observed promising.

Advance trial (early) :

In this trial nine entries were tested in four replications. The results were significant. Out of nine entries, Syn B-23, EH43672 and EH45072(B) have yielded 70% higher grain yield than the check Local (4763 Kg/ha). Composite J-103 was also observed promising.

Minikit trials of Manjri and Hunis Composites :

1. Object : To test the performance of Manjri and Hunis composites in the farmers field in maize growing districts of Maharashtra.
2. Year : 1976-77 Kh.
3. Plot size : 0.10 ha. (App.)
4. Locations : Maize growing districts of Maharasht

Sr. No.	Dists/Block	Grain yield (Kg/ha)		Pc. increase over local.	Grain yield (Kg/ha)		Pc. increase over Vijay
		Hunis	Local		Manjri	Local	
I.	Solapur						
1.	Malshiras	7300	6800	7%	7500	7100	6%
2.	Barshi	1120	675	51%	1800	1350	14%
3.	Karmala	--	--	--	3700	4020	- 8%
4.	Malgalwadha	5100	3400	50%	--	--	--

1.	2.	3.	4.	5.	6.	7.	8.
II.	Kolhapur :						
1.	Radhanagri	4200	2300	83%	5000	4500	11%
2.	Tikpurli	4800	3200	50%	5500	4400	25%
3.	Kolhapur	3600	2700	33%	4800	4100	15%
III.	Dhulia :						
1.	Shahada	3000	2000	50%	3000	3000	-
2.	Nandurbar	900	300	200%	1100	800	37%
IV.	Aurangabad :						
1.	Soegaon	5170	2400	115%	2630	2510	5%
2.	Jalna	3600	2400	50%	3150	1800	75%
3.	Jafrabad	1920	1600	20%	2400	2560	- 6%
4.	Bhokaradan	1000	750	33%	2000	2500	- 20%
5.	Aurangabad	2000	2100	- 5%	2000	1800	11%
V.	Agricultural School :						
1.	Agril. School Borgaon.	930	500	86%	1800	1630	12%
2.	Agril. School Solapur.	5266	3740	48%	4100	4530	- 9%
3.	Agril. School Malegaon.	--	--	-	4680	4130	12%

CONCLUSIONS :

Fifty three minikits of Manjri/Vijay and fifty minikits of Hunis/Local were conducted in the seven maize growing districts (Solapur, Kolhapur, Sangli, Satara, Dhulia, Osmanabad and Aurangabad) of Maharashtra and at the Agricultural Schools, Solapur, Borgaon, Jalgaon and Malegaon.

Results of Manjri/Vijay have been received from 16 locations and it was vitiated at 3 locations. Manjri comp. was found superior than the check Vijay at 13 locations out of 16 locations. On an average Manjri composite has given 21% more grain yield with 10 days earlier than the check Vijay.

Results of Hunis/local have been received from 15 locations, while at 4 locations the trial was vitiated. Out of 15 locations, at 14 locations, Hunis has given better performance and on an average yielded 72% more yield than

the check local. Hunis is comparable with local for maturity.

Release proposals for both the composites have been submitted, seperately.

Manjri composite :- is orange yellow, semi flint, bold seeded, medium maturing (110 days in kharif), tall growing (8-10 ft.), strong and stout plants with broad, dark green thick spreading leaves. It has considerable resistance to leaf blight (H. turcium), downey mildew, rust and stem borer. It is suitable for grain (sole crop) as well for fodder.

Hunis composite :- is yellow, semi dent seeded, early maturing (85-90 days in kharif), medium growing (6-7 Ft.), and sturdy plants with dark green spreading leaves. It has tolerable resistance to leaf blight (H.turcium), downey mildew, rust and stem borer. It is recommended for sole crop as well as for intercrop in sugarcane and turmeric.

Multiplication :

Seed of Manjri and Hunis composites is multiplied at Manjri farm (Poona) and Agricultural School, Digraj (Sangli) respectively and 10 quintals seed of each composite is obtained. Seed of experimental varieties of Manjri and Hunis was also multiplied on small scale.

RABI TRIALS

1) Introduction nursary :-

In this trial 56 entries including seven checks were tested in three replications. None of the entries was found statistically superior to the best check. Deccan-101 (6663 Kg/ha). However entry No 43 (CM400 x American early, (6379 Kg/ha) and entry No.44 (EH400575, 5995 Kg/ha), were observed promising and 8-10 days earlier than Deccan-101.

2) Medium/Early elite material :-

Thirty entries including seven checks were tested in four replication. The results were significant. EH-2310 has given highest grain yield (8465 Kg/ha) but was found

on par with best check Deccan-101.

Breeding work :-

During the Rabi season, 300 full-sib progenies and experimental varieties were developed in the promising progenies in third cycle in Manjri and Hunis composites. The breeding work in pop corn and sweet corn has been also initiated.

Summary of the results of Maize Breeding :-

1. Co-ordinated trials :-

In the co-ordinated trials, hybrid MMH-5, EH400575, two double top crosses and composite H.P.99 have shown better performances with 10 days earlier in maturity and given 28, 26, 34, 30 and 20 percent more grain yield respectively than the respective checks.

2. Zonal trials :-

In the zonal trials composite H3, Syn B-19, Hunis and Manjri (QFS2) were found promising and yielded 386, 354 and 11 percent grain yield respectively than the respective checks.

3. Advance trials (Early and Medium) :-

In the early advance trial Syn B-23, EH 43672, EH45072 and Comp. J-603 while in midlate advance trial Manjri Comp. and Syn B-21 were found superior than the respective checks.

4. Full sib progenies of Manjri and Hunis composites :-

Out of 225 progenies of each composite, 46 progenies of Manjri and 36 progenies of Hunis have shown better performance than the check Vijay and local respectively. In maturity Manjri is 10 days earlier than Vijay while Hunis is comparable with local.

5. Station trial :-

In station trial O.V. of Manjri composite (QFS2) (3767 Kg/ha) was found promising than the check Vijay (3384 Kg/ha).

6. Minikits of Manjri and Hunis Composites :-

i) Manjri composite was found superior than the check Vijay at 13 locations. out of 16 locations, On an average Manjri composite has given 21% more grain yield than Vijay and was 10 days earlier.

ii) Out of 15 locations, at 14 locations, Hunis has shown better performance and on an average it has yielded 72% more yield than the check local. It is comparable with local for maturity.

7. Rabi trials :-

In two rabi trials, CM400 x American early (6379 Kg/ha) and EH400575 (5995 Kg/ha) and EH 2310 (8465 Kg/ha) have shown better performance than the best check Deccan-101.

PART : II

WORK PROPOSED FOR 1977-78

A) Maize Breeding :-

1) Five trials of full-sib progenies of Manjri composite are to be conducted at Kolhapur and at two more locations in the Mahatma Phule Krishi Vidyapeeth jurisdiction which may be finalized in the sub-committee meeting.

2) As per dicisions of Annual Workshop, Co-ordinated, Zonal, Advance, Minikits will be conducted during 1977-78.

$$$$

B) MAIZE AGRONOMY

A) KHARIF TRIALS :

The different experiments conducted during the kharif 1976-77 were as per the technical programme approved in the Annual Maize Workshop and in addition to these experiments one experiment was laid out as station trial which was suggested by the Head, Department of Agronomy, and convenor Agronomy and Soils sub-committee.

Experiment : 3.6.3.2.(1) :

1. Title : Nitrogen x germplasm (early)
2. Object : To study the comparative response of some early germplasms to nitrogen application under rainfed condition.
3. Year of commencement : Kharif 1976-77 .
4. Experimental design : Split plot design with four replications and net plot size of 3.0 m x 1.5 m
5. Treatments : Twenty four combinations of eight germplasms as main plots and three levels of nitrogen as sub-plots.
6. Main plots : 1) VL-42 2) H-3 3) J-603 4) B-19 5) B-21 6) B-23 7) Hunis 8) Local.
7. Sub - plots : Nitrogen levels - 0, 45, and 90 Kg/ha
8. Results and discussion:

Table - 1 : Effect of levels of nitrogen on mean grain yield of different germplasms (q/ha).

Sr. No.	Germplasm	Levels of nitrogen Kg/ha 0	45	90	Mean
1.	VL-42	13.67	30.08	42.33	28.69
2.	H-3	11.00	35.75	43.92	30.25
3.	J-603	15.25	37.00	55.25	35.83
4.	B-19	10.83	27.50	40.75	26.36
5.	B-21	15.25	39.83	58.17	37.75
6.	B-23	19.17	47.67	65.00	43.95
7.	Hunis	20.08	42.08	77.25	46.47
8.	Local	12.00	26.75	43.24	27.33
	Mean	14.66	35.84	53.24	

	S.E.±	C.D. at 5%
Germplasm	0.94	2.75
Levels of nitrogen	1.70	4.83
Germplasm x levels of nitrogen	5.54	N.S.

The germplasms Syn-B-23 and Hunis composite have yielded significantly highest grain yield than other germplasms. The germplasms J-603, B-21 and H3 were at par. The germplasms V.L.42, B-19 and local were at par.

Application of 90 Kg/N/ha has given significantly 263% and 49% more grain yield than no nitrogen application and 45 Kg N/ha respectively. Application of 45 Kg N/ha has also given significantly 140% more grain yield than no nitrogen application.

The interaction effects were found not significant.

Experiment : 3.6.3.2.(2) :

1. Title : Azotobactor experiment.
2. Objective : To study the contribution of Azotobactor culture in nitrogen economy of the improvement of maize yield (variety Manjri Composite).
3. Year of commencement : Kharif 1976-77 .
4. Experimental design : Randomised block of design with four replications and net plot size 8.0 m x 1.5 m.
5. Treatments : Twelve conbinations of three levels of nitrogen, two levels of f.y.m. and two treatments of Azotobactor.

1) Levels of nitrogen :-

0, 60 and 120 Kg/ha.

2) Azotobactor :-

i) Treated
ii) Not treated.

3) f.y.m. :-

i) Applied at 10 tonnes/ha.
ii) Not applied.

able - 2 : Effect of levels of nitrogen and Azotobactor treatment on mean grain yield (q/ha).

Azotobactor treatment	Levels of nitrogen Kg/ha			Mean
	0	60	120	
Treated	45.33	57.91	67.25	56.83
Not treated	41.00	50.42	63.42	51.61
Mean	43.16	54.16	65.33	

	S.E. ±	C.D.at 5%
Levels of nitrogen	1.33	3.74
Azotobactor treatment	1.08	3.00
Levels of nitrogen x Azotobactor treatment	1.83	N.S.

Application of 120 Kg N/ha has given significantly 51% and 20% more grain yield than no nitrogen application and 60 Kg N/ha respectively. The application of 60 Kg N/ha has also given significantly 26% more grain yield than no nitrogen application.

The Azotobactor treatment has given significantly 11% more grain yield than no treatment.

The interaction effects were found not significnat.

Table - 3 : Effect of levels of nitrogen and f.y.m. on mean grain yield (q/ha).

f.y.m.	Levels of nitrogen Kg/ha			Mean
	0	60	120	
Applied 10 tonnes per hectare	43.50	52.75	66.25	54.17
Not applied	42.83	55.58	64.42	54.28
Mean	43.16	54.16	65.33	

	S.E. ±	C.D. at 5%
f.y.m.	1.25	N.S.
Levels of nitrogen x f.y.m.	1.83	N.S.

...20...

Application of f.y.m. and interaction of nitrogen and f.y.m. have no significant effect on mean grain yield, However, application of 120 Kg N/ha with 10 tonnes f.y.m. per hectare has given highest grain yield of 66.25 q/ha.

Table - 4 : Effect of Azotobactor and f.y.m. on mean grain yield (q/ha).

Application of f.y.m.	Azotobactor treated	Treatment Not treated	Mean
Applied 10 tonnes/ha	57.17	51.16	54.17
Not applied	56.49	52.07	54.28
Mean	56.83	51.61	

	S.E. ±	C.D.at 5%
f.y.m. x Azotobactor	1.58	N.S.
Levels of nitrogen x f.y.m. x Azotobactor	0.83	N.S.

The interactions between f.y.m. and Azotobactor have no significant effect on mean grain yield. However, application of f.y.m. 10 tonnes/ha and Azotobactor treatment has given highest grain yield of 57.17 q/ha.

The interactions between nitrogen x Azotobactor x f.y.m. were found not significant.

Experiment : 3.6.3.2. (3)

1. Title : Plant population and nitrogen fertilization.
2. Object : To study the effect of different plant populations an and levels of nitrogen on the grain yield of pre-released maize composite (Manjri composite).
3. Year of commencement : Kharif 1975-76.
4. Treatments : Twelve combinations with three plant populations as main plots and four levels of nitrogen as sub-plots.

6) Results and discussion :

Table - 5 : Mean grain yield (q/ha) :

Plant population 000/ha.	Levels of nitrogen Kg/ha 80	120	160	200	Mean
50,000	21.08	26.83	31.25	35.08	28.56
75,000	21.63	28.50	32.25	37.63	30.00
1,00,000	17.50	26.21	34.63	41.67	30.00
Mean	20.07	27.18	32.71	38.13	

	S.E.±	C.D.at 5%
Plant population	1.47	N.S.
Levels of nitrogen	1.18	3.28
Plant population x nitrogen levels.	2.05	5.67

From the above table, it would be seen that increase in plant population has no significant effect on grain yield. However, the plant population of 75,000 and one lakh plants/ha have given more grain yield over 50,000 plants per hectare.

The grain yield was increased significantly with the increased levels of nitrogen from 80 Kg N/ha to 200 Kg N/ha. The application of 200 Kg N/ha has given significantly highest grain yield of 38.13 q/ha which was 90%, 40% and 11% more than 80, 120 and 160 Kg N/ha respectively. Application of 120 and 160 Kg N/ha have also given significantly 35% and 67% more grain yield respectively than 80 Kg N /ha.

Application of 120, 160 and 200 Kg N/ha have given significantly more grain yield with 50, 75 thousand and one lakh plant population per hectare than 80 Kg N/ha. The application of 200 Kg N/ha with one lakh plant population gave highest grain yield of 41.67 q/ha.

B) RABI : 1975-76

Experiment : 3.6.3.2. (1) :

1. Title : Nitrogen x germplasm (mid.late)
2. Object : To study the ceparative response of some promising germplasms to nitrogen application.
3. Year of commence-ment : Rabi 1975-76.
4. Experimental design : Twenty eight treatment combinations with sevel germplasms as main plots and four levels of nitrogen as sub-plots.

Main plots : Germplasm :

1. E.H.2420
2. E.H.2380
3. V.L. 43
4. J-305
5. Vijay
6. DHM
7. Local

Sub plots : Nitrogen levels :

0,60, 120, and 180 kg N/ha.

6. Result and discussion

Table : Effect of levels of nitrogen on mean grain yield of different germplasms (q/ha).

Germplasm	Levels of nitrogen kg/ha				Mean
	0	60	120	180	
1. E.H.2420	46.08	65.58	72.75	73.08	65.37
2. E.H. 2380	45.75	67.92	71.67	71.25	64.15
3. V.L.43	40.17	60.92	63.58	66.92	57.90
4. J-305	31.42	54.25	57.08	61.08	50.96
5. Vijay	42.00	55.50	58.42	57.83	53.44
6. D.H.M.	34.92	56.67	59.08	69.08	54.94
7. Local	34.83	56.38	56.17	56.25	48.21
Mean	39.31	59.61	61.59	65.07	

	S.E.±	C.D. at 5%
Germplasm	1.99	5.87
Nitrogen	0.99	2.78
Germplasm x Nitrogen	2.83	N.S.

Both germplasms E.H.2380 and E.H.2420 have yielded significantly more grain than Deccan Hybrid Maize. The yield of V.L. 43' and Vijay was statisticaly at par with the yield of Deccan Hybrid. Maize. The local has given the lowest yield.

The response to nitrogen application was significant upto 180 Kg N/ha. Application of 180 Kg N/ha has given significantly 70% and 5% more grain yield than 0, 60, 120 and 180 Kg N/ha. The application of 60 Kg N/ha has also given significantly 52% more grain yield over no nitrogen application.

The interaction effects were found not significant.

Experiment : 3.6.3.1.(1) :

1. Title : Response of maize germplasms to different dates of planting during rabi season.
2. Object : To find out optimum date of planting for different germplasms during rabi season.
3. Year of commencement : Rabi 1975-76.
4. Experimental design : Split plot design with four replications and net plot size 6 m x 1.5 m
5. Treatments : Thirty treatment combinations with three dates of planting as main plots and ten germplasms as sub-plots.
6. Main plots : Dates of planting :

   1. 15th December, 75.
   2. 30th December, 75.
   3. 14th January, 76.

   Sub-plots : Germplasms :

   1. Local 2. Vijay 3. E.H.23
   4. Ganga Safed-2 5. Hunis
   6. DHM 7. Deccan-101
   8. Vikram 9. Hi-starch
   10. E.H.2380.

6. Result and discussion :

Sr. No.	Germplasm	Dates of planting			Mean
		15th Dec.	30th Dec.	14th Jan.	
1 .	Local	57.00	55.00	59.67	57.22
2 .	Vijay	92.33	82.83	59.33	78.16
3 .	E.H.2310	88.33	71.00	68.33	75.89
4..	Ganga Safed-2	90.67	80.00	70.00	80.22
5..	Hunis	90.17	81.83	63.17	78.39
6 .	DHM	84.00	89.67	73.33	82.33
7 .	Deccan-101	100.00	91.83	64.50	85.44
8 .	Vikarm	86.00	78.50	77.50	80.67
9 .	Hi-starch	100.00	91.67	65.00	85.56
10.	E.H.2380	97.50	77.00	66.00	80.17
	Mean	79.58	79.33	66.68	

	S.E.±	C.D. at 5%
Dates of planting	2.47	3.55
Germplasm	2.93	8.25
Date of planting x germplasm.	5.07	14.25

From the result it would be observed that the early planting on 15th December and 30th December has given significantly more grain than late planting on 14th January.

Almost all the germplasms were statistically at par in their performance under different dates of planting except local which has given the lowest yield.

There were significant interactions between the dates of planting and germplasms. There was no significant difference of grain yield of local at different dates. All other germplasms has shown significant reduction in yield due to late sowing on 14th January when compared with 30th December. In case of Hi-starch, E.H.2380, Deccan 101 the reduction in yield due to one month delay in planting (December 15 to January 14) ranged from 31.50q/ha to 35.16 q/ha).

Experiment : 3.6.3.1.(2) :

1. Title : Demonstration trial .
2. Object : To demonstrate the superiority of recommended cultural practices over local practices.

3. Year of commencement : Rabi 1974-75 .

4. Experimental design : Randomised Block design.

5. Treatments : Four combinations of two germplasms local and Vijay and two cultural practices as local and improved at two locations.

6. Results and discussion :

Sr. No.	Packages of practices		Mean
	Local	Improved	
Local	35.42	44.36	39.89
Vijay	57.06	63.93	60.50
Mean	46.24	54.14	

The improved variety Vijay has yielded 20.6 q/ha more grain than local. The Vijay has yielded highest grain (63.93 q/ha) with improved package of practices.

In case of cultural practices, both the varieties local and Vijay have yielded 8.94 and 6.87 quintals more grain per hectare respectively, with recommended package of practices than local practices.

SUMMARY

A) KHARIF 1976-77 :

Experiment : 3.6.3.2.(1) :

The germplasms Syn. B-23 and Hunis composite have yielded significantly highest grain yield than other germplasms. Application of 90 Kg N/ha has given significantly 263% and 49% more grain yield than no nitrogen application and 45 Kg N/ha respectively.

Experiment : 3.6.3.2.(2) :

Application of 120 Kg N/ha has given significantly 51% and 20% more grain yield than no nitrogen application and 60 Kg N/ha respectively. The Azotobactor treatment has given significantly 11% more grain yield than no treatment.

Experiment : 3.6.3.2.(3) :

The grain yield was increased significantly with increased levels of nitrogen from 80 to 200 kg N/ha. The application of 200 kg N/ha has given significantly 90%, 40% and 11 % more grain yield than 80, 120 and 160 Kg N/ha. Application of 120, 160 and 200 kg N/ha-- have given significantly more grain yield with 50, 75 thousand and one lakh plant population per hectare than 80 kg N/ha.

B) RABI 1975-76 :

Experiment : 3.6.3.2.(1) :

Both germplasms E.H.2380 and E.H. 2420 have yielded significantly more grain yield than Deccan Hybrid Maize. Application of kg N/ha was given significantly 70, 95 5 % more grain yield than no nitrogen application and 60 kg nitrogen per hectare.

Experiment : 3.6.3.1 (1) :

The early planting on 15th and 30th December has given significantly 18 % more grain yield than the late planting on 14th January. All the germplasms yielded significantly more grain than local. The germplasms have shown the significant reduction in yield, with late planting except local.

Experiment : 3.6.3.1.(2) :

The improved variety and improved cultural practices have given 20.6 and 7.90 q/ha more grain yield than local variety and local cultural practices respectively.

PART II

The experiments mentioned above would be conducted as per the decision of Annual Maize Workshop.

(C) MAIZE ENTOMOLOGY

Screening of maize germplasms for their resistance to Chilo partellus, (Swinhoe).

One hundred and forty seven Hunis full sib families were screened for their resistance to maize stalk borer during Kharif 1976. In order to facilitiate release of borer eggs screening was carried out in three sets, sown at different dates.

Each set was sown in randomized block design with two replications. The row to row and plant to plant distance was 75 and 60 cm respectively. The black head stage eggs (20-25) of Chilo partellus, S. were introduced with the help of pinned tissue papers in the whorls of all the plants, in each replication and of each germplasm after 19 and 20 days after germination. The hatching of eggs was c'ecked randomly and it was about 90-95 per cent. Observations based on leaf injury were recorded 16 days after the release of egg masses in all the 1st, 2nd and 3rd sets which were sown on different dates i.e. 7th, 12th and 13th July, 1976 respectively.

Observations based on rating (1-9) thus recorded were transformed individually to scores for ranked data (Fisher and Yates) and the same was subjected to analysis of variance. It was found that in first two sets, there were significant differences among the various maize germplasms with regard to their susceptiblity to Chilo partellus, S. While in third set, no significant differences were observed.

On the basis of leaf injury caused by Chilo partellus, S. the germplasms could be grouped in to three catagories, in each of the sets seperately as below :-

Set No - 1 : Trial No-41 (Table 1) :

1. Least susceptible :- Hunis .F.S.44, 28, Ganga-5, Vijay, Hunis f.s. 38, and 17.

2. Intermediate :- Hunis F.S.24, 6, 12, 16, 14, 21, 7, 13, 18, 19, 25, 27, 11, 4, 36, 29, 15, 40, 32, 1, 20, 42, 37, 23, 35, Hunis comp., Hunis f.s.2 , 39, 43, 45, 10, 3, 9, Local, 26, 34, 31, 81, 4, 45, 5, 22, and 30.

Set No - 2 : Trial No-42 (Table 2) :

1. Least susceptible :- Hunis f.s. 58, 88, Hunis composite, 47, 70.

2. Intermediate :- Hunis f.s. 11, 86, 80, 89, 79, Ganga-5, 46, 51, 76, Vijay, 77, 68, 90, 55, 69, 64, 71, 83, 87, 63, 65, 72, Local, 56, 75, 62, 78, 85, 59, 48, 60, 53, 81, 67.

3. Highly susceptible :- 49, 50, 73, 84, 74, 57, 52, 82, 54, 61.

Set No - 3 : Trial No-43

The results of the trial were insignificant.

Set No - 4 : Early maturing composites : Trial No.66

Twenty eight early maturing maize lines were screened for their resistance to Chilo partellus, S. and it was found that there were no significant differences among the various germplasms with regard to their susceptibility.

Set No - 5 : Very early maturing germplasms: trial No.67 (Table 3) :

Ten very early maturing maize lines were screened for their resistance to Chilo partellus, S.

On the basis of leaf injury caused by Chilo partellus, S. the germplasms could be grouped in to three catagories as below :-

1. Least susceptible :- H62, M1, M2, H211, Vijay, Diara, Local, A51-54.

2. Intermediate :- D747, D765.

EVALUATION OF SOME OF THE INSECTICIDES FOR THE CONTROL OF MAIZE PESTS WITH SPECIAL REFERENCE TO MAIZE STALK BORER .

Location	:	Gramsevak Training Centre, Kolhapur.
Design	:	Split plot design.
Treatments	:	Main - 2 Sub - 4
Replications	:	4
Plot size	:	Net - 3 rows of 5 m length. Gross - 8 rows of 6 m length.

The trial was laid out in split plot design. The carbofuran 3 G and cytrolane 5 G were applied only once as whorl treatment when the plants were 15 days old. 10% BHC was applied with the help of stik and muslin cloth to the crop of one week old. The second dusting was given after one week. The observations pertaining to per cent infestation and yield were recorded. The data were statistically analysied and the results are summarised below :-

Table showing per cent infestation of Chilo partellus, S. and yield in quintals per hacter.

Treatment	Per cent infestation	Yield q/ha
Main treatments:-		
Ganga-5	*(23.35)	16.08	66.67
Local	(22.13)	14.62	32.00
F.	** N.S.		N.S.
S.E.±	---		---
C.D. at 5%	---		---
Sub-treatments :-			
Carbofuran 3 G	(18.59)	10.27	62.22
Cytrolance 5 G	(21.43)	13.47	59.20
BHC 10%	(24.74)	17.79	45.51
Control	(26.30)	19.38	31.64
F.	Sign.		Sign.
S.E. ±	0.88		3.95
C.D. at 5%	2.63		11.73

* Figures in the parantheses are the Angular transformations of percentages.

** Non significant.

Result :-

It can be seen from the above table that there were no significant difference observed between Ganga-5 and local as regards to their per cent infestation and yield. However, in insecticidal treatments all the insecticidal treatments were significantly superior to control with regards to per cent infestation and yield.

The treatment with carbofuran 3 G was statistically significant over rest of the treatments as regards to per cent infestation and yield but was on par with cytrolane 5 G as regards to yield.

Thus, it can be concluded that the whorl treatment with carbofuran 3 G at the rate of 7.5 Kg per hectare on 15 days old crop may be recommended for the control of maize stalk borer.

Besides the above research programme given by the Project Co-ordinator (Maize) the following research work was carried out.

I. PER CENT INFESTATION OF MAIZE STALK BORER, CHILO PARTELLUS, S ON "HUNIS FULL-SIB FAMILIES" UNDER NATURAL INFESTATION

The observations on per cent infestation of maize stalk borer were recorded on "Hunis full-sib families" sown by the Assistant Maize Breeder at this centre, under natural infestation. The entries with their per cent infestation are as given below :-

Entry No.	Infestation %	Entry No.	Infestation %	Entry No.	Infestation %	Entry No.	Infestation %	Entry No.	Infestation %
Trial 41		Trial 42		Trial 43		Trial 44		Trial 45	
4.	4.0	5.	12.0	4.	14.5	1.	3.0	12.	7.0
5.	7.5	6.	15.0	8.	5.0	4.	12.0	13.	9.5
6.	2.5	7.	6.0	9.	6.0	5.	10.5	14.	7.5
8.	9.0	12.	11.5	10.	6.0	11.	7.5	16.	5.0
12.	3.0	13.	8.5	14.	9.5	12.	12.0	17.	8.5
16.	6.0	14.	3.5	15.	9.0	13.	8.5	22.	6.5
18.	4.0	21.	3.5	16.	7.5	14.	7.0	25.	22.5
21.	6.5	22.	3.0	17.	10.0	15.	5.0	31.	6.5
22.	5.5	24.	7.5	18.	3.0	19.	7.5	34.	8.0
23.	6.5	26.	3.5	19.	15.0	25.	9.0	35.	6.2
26.	14.0	32.	8.0	23.	15.0	26.	4.0	36.	7.0
29.	3.0	36.	32.0	24.	11.5	27.	9.0	39.	7.0
37.	4.0	37.	16.0	25.	3.0	28.	3.0	49.	8.0
46.	4.0	38.	9.0	32.	3.5	36.	6.0		
47.	6.0	39.	11.0	33.	3.0	37.	12.0		
		41.	3.5	35.	21.5	44.	4.0		
		42.	12.0	44.	10.5	45.	11.5		
		43.	4.5	46.	8.5	46.	12.0		
		46.	3.5	49.	6.0	47.	11.0		

II. STUDIES ON RELATIONSHIP OF NUMBER OF MAIZE STALK BORER LARVAE AND THEIR DAMAGE .

To assess the damage an experiment was conducted by releasing different no. of 1st instar larvae in the whorls of the plants.

There were 7 treatments replicated four times. The newly hatched larvae were released in the whorls of the plants with the help of camel hair brush at 20 and 21 days after germination. These plants were rated from No. 1 to 9 based on the leaf injury caused by the stem borer, 15 days after the release of the larvae. The rating was transformed individually to scores for ranked data and further analysis of veriance was carried out.

It can be seen from the table below that the treatment with 20, 25 and 30 larvae of maize stem borer caused considerable damage. The treatment with 30 larvae of maize stem borer gave 100 per cent dead hearts.

Table showing the original and transformed means :

Sr. No.	Treatment No. of larvae.	O.M.	T.M.
1.	0	1.00	- 1.49
2.	5	4.00	- 0.56
3.	10	4.50	- 0.13
4.	15	4.50	- 0.14
5.	20	7.50	+ 0.75
6.	25	8.75	+ 1.35
7.	30	9.00	+ 1.49
		S.E. ±	0.035
		C.D. at 5% -	0.1037

III. EARWIGS INFESTING MAIZE

Earwigs, the insect pest of agricultural fields is common throughout India. Some of the species have been reported as Phytoghagous and often cause extensive damage to seedlings and flowers of the crop and also been listed as pests of economic value. During both kharif and Rabi seasons 1976-77 there was a considerable population found on the maize at Gramsevak Training Centre, Kolhapur. There were 5 to 15 earwigs per maize plant with an average of 9 . They were found in tassels, husk and silk, leaf sheaths and root zone. At germinating stage some seedlings were found to be died and earwigs were seen at the root zone. The earwigs were collected and are sent for identification.

IV. EVALUATION OF SOME OF THE INSECTICIDES FOR THE CONTROL OF TOBACCO LEAF EATING CATERPILLER, SPODOPTERA LITURA F. ON GRAPES

Tobacco leaf eating caterpiller Spodoptera litura F. (Lepidoptera. Fam. Noctuidae) is a polyphagus insect pest causing serious damage to many crops in India and several other contries. A laboratory trial was conducted with nine insecticides replicated three times to see their efficacy against this pest on grape.

Eggs were collected from the grap garden of Gramsevak Training Centre, Kolhapur in November, 76 and after hatching the larvae were reared on green leaves of grapes

in the glass throughs (15cm x 10 cm). The soil was filled up to ¼ capacity of these glass throughs. Fresh [illegible] were given three times a day. The larvae in 3rd and 4th instars were transferred to glass petri dishes. Ten larvae were kept in each petri dish. The petri dishes were numbered from No. 1 to 10 and set was replicated thrice.

One litre spray fluid of desired concentration of every insecticide was prepared. Exactly ½ ml. spray fluid of each insecticide was sprayed with the help of automiser on 10 larvae on both sides of a green leaf and inner sides of both the lids of a petridish. The moratality count was taken after 3, 6 and 12 hours after application of insecticides.

The mortality percentages were transformed to their corresponding arcsin angles and the data was further analysed.

RESULTS :-

It can be seen from the table 4 that all insecticidal treatments were significantly superior over control at 12 hours after treatment except endrin (0.03%) at 6 hours and formothion (0.05%) BHC (0.2%) endrin (0.03%) at 3 hours after insecticidal application. The treatment with 0.05% Metacid 50 gave maximum per cent kill at 3 hours (80.00%), 6 hours (81.14%) and 12 hours (100%) but it was at par with the treatment of 0.05% dichlorvos at 3 hours, 0.05% dichlorvos at 6 hours and 0.05% dichlorvos, 0.05% quinalphos, 0.05% Sumithion and 0.2% carbarly at 12 hours after insecticidal application.

V) SURVEY OF THE MINIKIT TRIALS :

The survey was undertaken to observe the incidence of pests of maize in Kolhapur, Solapur, Dhule, Aurangabad, Satara, Sangli and Pune districts of the Maharashtra State. As many as 14 minikit demonstration plots of maize were visited in the month of September, 76. The number of infested plants were counted from 10 m length of a row at randomly selected three spots and per cent infestation was calculated and is given below :-

Sr. No.	Name of the Block	% infestation of maize stem borer
1.	Pandharpur	5
2.	Madha	7
3.	Barchi	10
4.	North Solapur	6
5.	South Solapur	5
6.	Kalamb	5
7.	Aurangabad	11
8.	Jalgaon	5
9.	Shinkheda	15
10.	Nandurbar	10
11.	Jalana	7
12.	Aurangabad	5
13.	Manjri	14
14.	Kolhapur	18

SUMMERY :

One hundred and eighty five Hunis full sib families and other germplasms were screened for their resistance to maize stalk borer, Chilo partellus, S under artificial infestation. In these germplasms 9 Hunis full sib progenies and eight other germplasms were found reletively more resistant.

In chemical control of maize stalk borer trial the whorl treatment with Carbofuran 3 G at the rate of 7.5 Kg per hectare was found more effective.

Observations on per cent infestation of maize stalk borer in Hunis full sib families under natural conditions were taken. The 24 entries of Hunis progenies had more than 10% infestation of maize stalk borer, Chilo partellus, S .

Studies on relationship of number of stalk borer larvae and their damage were undertaken. It was found that 20, 25 and 30 larvae of maize stalk borer caused considerable damage.

There were 5 to 15 earwigs per maize plant with an average of 9. They were found in tassels, husk and silk, leaf sheaths and root zones. Germinating seedlings were found died due to earwigs.

Besides this maize work a laboratory trial on chemical control of tobacco leaf eating caterpillers, Spodoptera litura F was conducted . It was found that Metacid 50 gave 100% kill at 12 hours after treatment on grapes.

The survey of the minikit trials was undertaken to observe the incidence of pests on maize in Kolhapur, Solapur Dhule, Aurangabad, Pune districts of the Maharashtra State. The infestation of maize stem borer was found to be ranging from 5 to 18 per cent.

Part : II

WORK PROPOSED FOR 1977-78

As per the decisions of Annual Maize Workshop meeting the trials will be conducted.

Trial No : 41 (Table 1)

Sr. No.	Germplasm	O.R.*	T.V.	Sr. No.	Germplasm	O.R.	T.V.
1.	Hunis F.S.44	4.78	- 0.12	26.	Hunis F.S. 1	7.30	+ 0.81
2.	28	4.91	- 0.02	27.	20	7.40	+ 0.82
3.	Ganga-5	5.00	+ 0.02	28.	42	7.60	+ 0.82
4.	Vijay	5.38	+ 0.13	29.	37	7.31	+ 0.84
5.	Hunis F.S.38	5.45	+ 0.19	30.	23	7.40	+ 0.85
6.	17	5.58	+ 0.19	31.	35	7.50	+ 0.87
7.	45	5.10	+ 0.25	32.	Hunis comp.	7.70	+ 0.89
8.	6	5.70	+ 0.37	33.	Hunis F.S. 2	7.55	+ 0.90
9.	12	5.70	+ 0.40	34.	39	7.60	+ 0.92
10.	16	6.29	+ 0.40	35.	43	7.70	+ 0.92
11.	14	6.31	+ 0.44	36.	45	7.35	+ 0.94
12.	21	6.35	+ 0.45	37.	10	7.20	+ 1.00
13.	7	6.50	+ 0.48	38.	3	7.60	+ 1.04
14.	13	6.10	+ 0.49	39.	9	7.40	+ 1.07
15.	18	6.40	+ 0.51	40.	Local	7.25	+ 1.07
16.	19	6.50	+ 0.53	41.	Hunis F.S.26	7.35	+ 1.07
17.	25	6.40	+ 0.55	42.	34	7.45	+ 1.09
18.	27	6.46	+ 0.56	43.	31	7.40	+ 1.11
19.	11	6.87	+ 0.59	44.	8	7.40	+ 1.12
20.	4	7.00	+ 0.64	45.	41	7.00	+ 1.13
21.	36	6.90	+ 0.64	46.	43	7.70	+ 1.23
22.	29	6.70	+ 0.66	47.	5	7.81	+ 1.26
23.	15	6.80	+ 0.68	48.	22	8.50	+ 1.27
24.	40	6.90	+ 0.69	49.	30	9.00	+ 1.49
25.	32	7.40	+ 0.79				

S.E. ± 0.95

C.D. at 5% 2.69

O.R. = Original rating T.V. = Transformed value.

* Maximum possible injury score is 9

Trial No : 42

(Table 2)

Sr. No.	Germplasm	D.R.	T.V.
1.	Hunis F.S. 58	4.16	- 0.45
2.	88	4.61	- 0.43
3.	Hunis comp.	4.62	- 0.38
4.	Hunis F.S. 47	4.30	- 0.29
5.	70	4.65	- 0.05
6.	66	4.81	+ 0.02
7.	86	4.77	+ 0.03
8.	80	4.87	+ 0.03
9.	89	5.00	+ 0.08
10.	79	5.60	+ 0.10
11.	Ganga-5	5.65	+ 0.18
12.	Hunis F.S.46	5.71	+ 0.21
13.	51	5.60	+ 0.23
14.	76	5.60	+ 0.23
15.	Vijay	5.66	+ 0.27
16.	Hunis F.S.77	6.50	+ 0.32
17.	68	6.00	+ 0.34
18.	90	6.30	+ 0.38
19.	55	6.50	+ 0.43
20.	69	6.25	+ 0.46
21.	64	6.41	+ 0.47
22.	71	6.55	+ 0.51
23.	83	6.70	+ 0.56
24.	87	6.55	+ 0.60
25.	25	6.33	+ 0.60.
26.	Hunis F.S.65	6.72	+ 0.65
27	72	6.88	+ 0.65
28.	Local	6.88	+ 0.65
29.	Hunis F.S.56	6.75	+ 0.68
30.	75	7.16	+ 0.69
31.	62	7.33	+ 0.70
32.	78	7.21	+ 0.70
33.	85	7.10	+ 0.72
34.	59	7.27	+ 0.76
35.	48	7.75	+ 0.78
36.	60	7.33	+ 0.81
37.	53.	7.33	+ 0.82
38.	81	7.12	+ 0.82
39.	67	7.33	+ 0.86
40	49	7.33	+ 0.91
41.	50	7.60	+ 0.93
42.	73	7.30	+ 0.93
43.	84	7.93	+ 1.01
44.	74	8.10	+ 1.03
45.	57	8.20	+ 1.08
46.	52	8.10	+ 1.13
47.	82	8.38	+ 1.22
48.	54	8.40	+ 1.32
49.	61	9.00	+ 1.49

S.E. ±	0.36
C.D. at 5%	1.01

Trial No : 67 (Table - 3)

Sr. No.	Germplasms	O.R.	T.V.
1..	H 62	3.60	- 0.60
2..	M 1	3.90	- 0.60
3..	M 2	3.94	- 0.48
4..	H 211	3.80	- 0.30
5..	Vijay comp.	5.04	- 0.17
6..	Diara	5.91	+ 0.15
7..	Local	6.66	+ 0.31
8..	A 51-54	6.72	+ 0.32
9..	D 747	6.16	+ 0.38
10.	D 765	6.35	+ 0.46
	S.E. ±		0.89
	C.D. at 5%		2.58

ndpatil:

Table - 4 TABLE SHOWING THE EFFICACY OF DIFFERENT INSECTICIDES AGAINST [illegible] EGEUS F.

Insecticides used		Per cent kill hours after treatment					
		3 hours		6 hours		12 hours	
1. Metasid	(0.03%)	80.00	(68.07)	93.33	(81.14)	100.00	(90.00)
2. Dichlorvos	(0.05%)	76.66	(61.22)	100.00	(90.00)	100.00	(90.00)
3. Quinolphos	(0.05%)	50.00	(45.00)	83.00	(70.77)	100.00	(90.00)
4. Sumithion	(0.05%)	46.66	(43.08)	83.00	(70.07)	90.00	(75.00)
5. Carbaryl	(0.2 %)	30.00	(33.00)	46.66	(43.07)	76.66	(66.14)
6. Endosulfan	(0.05%)	23.33	(24.14)	33.33	(35.00)	66.66	(60.00)
7. Formothion	(0.025%)	6.66	(8.85)	20.00	(26.56)	46.66	(43.07)
8. BHC	(0.2 %)	00.00	(00.00)	23.33	(24.14)	43.33	(41.15)
9. Endrin	(0.03%)	00.00	(00.00)	13.33	(17.70)	46.66	(43.07)
10. Control		00.00	(00.00)	00.00	(00.00)	00.00	(00.00)
	S.E.±		6.65		7.25		9.19
	C.D. at 5%		19.74		21.53		27.29

* Figures is the parantheses are the Angular transfarmation of percentages.