

**DFID FUNDED INDO-UK COLLABORATIVE PROJECT**  
**On**  
**Farmers Participatory Varietal Selection in *Rabi* Sorghum**  
**Final Technical Report (1999-2002)**

<b>Title of the Project:</b>	Farmers Participatory Varietal Selection in <i>Rabi</i> Sorghum	
<b>RNRRS Programme :</b>	R 7409	
<b>Programme Manager (Institution):</b>	National Research Centre for Sorghum, Rajendranagar, Hyderabad	
<b>Sub-contractor (if relevant):</b>		
<b>RNRRS Programme purpose:</b>		
<b>RNRRS Production system:</b>	Semi-arid	
<b>Commodity base:</b>	Sorghum	
<b>Beneficiaries:</b>	Farmers, Scientists	
<b>Target institutions</b>	NRCS, Hyderabad, India and CAZS, University of Wales, Bangor, UK.	
<b>Geographical focus:</b>	India	
	<b>Planned</b>	<b>Actual</b>
<b>Start Date</b>	July 1999	July 1999
<b>Finish Date</b>	June 2002	June 2002
<b>Total cost</b>	UK Pounds 137, 413	

## 1. Background

*Rabi* (post rainy season) sorghum is grown over 6 m ha in India primarily for food and fodder, but it has low productivity. This means that farmers are growing inferior cultivars for which inputs are also lower than in the best genetic material was grown. The choice of varieties for farmers is limited to a few local cultivars because released varieties do not meet farmers' criteria.

Participatory varietal selection (PVS) provides an opportunity for farmers to select one or more varieties from a basket of recently developed genotypes from plant breeding programs. Witcombe et al. (1996) reported that if a suitable choice of cultivar exists, PVS is a more rapid and cost effective way of identifying farmer-preferred cultivars than conventional, transfer-of-technology and extension methods.

In India, Maurya et al. (1988) tested advanced lines of rice with villagers in Uttar Pradesh and successfully identified superior material that was preferred by farmers. Also in India, Joshi and Witcombe (1996) identified farmer-acceptable cultivars of rice and chickpea from a range of released and non-released cultivars tested in farmer-managed participatory

trials. Farmer-acceptable cultivars were found among released varieties but not among those recommended for the area. Participatory varietal selection by the DFID-funded KRIBHCO project in Western India has demonstrated that farmers adopt better cultivars once a basket of choice is offered to them, e.g. a large-scale adoption of other state variety Kalinga III of rice in the rain fed areas of Rajasthan, Madhya Pradesh and Gujarat.

The participatory approach to varietal selection is considered valuable when formal breeding and seed-supply systems have been unable to fulfill the needs of users. This often occurs where the agro-ecological or socio-economic environment differs significantly from those anticipated and tested for in the formal system of variety testing. In *rabi* sorghum, several factors mean that PVS could be a useful approach: low adoption of improved cultivars, variable growing conditions and multiple production constraints in farmers' fields that are difficult to simulate on the research station, and local preferences for grain quality (Rana et al. 1998).

Farmers desire the following traits incorporated in *rabi* cultivars: High yield and quality of both grain and fodder, bold and lustrous grains, and resistance to biotic and abiotic stresses equal to M35-1(Rana et al. 2000). Under these constraints, a PVS approach involving farmers for selection and genetic enhancement would be worthwhile. Participatory methods, suitably modified from those used in KRIBHCO west, were tested for *rabi* sorghum varietal selection in three states i.e. Andhra Pradesh, Maharashtra and Karnataka. In the first phase, available elite varieties and advanced generation genotypes were provided to farmers for selection and adoption under a wide spectrum of socio-economic environments. This laid the foundation for the exploitation of the most adopted cultivars as parents in participatory plant breeding.

## 2. Project purpose:

- Selection of suitable varieties by farmers from improved cultivars tested in farmer-managed trials
- Demonstration of farmer participatory research (FPR) methods those are effective in increasing cultivar diversity and replacement rate and thereby production.
- Increased farmer(both men and women) participation
- Promotion of superior local varietal selections, natural management practices, and low cost production technology identified in farmer managed trials.
- Production of *rabi* sorghum on impoverished soils in semi-arid conditions increased by selection and genetic enhancement of cultivars.
- Physiology of the drought resistance in *rabi* sorghum understood, plant genes coding for resistance transferred into adapted genetic background and tolerant strains promoted in the target area.
- Collection of local landrace biodiversity for conservation and utilization in breeding programmes.

## 2.1. Methods:

Two methods for popularization of new varieties (extension) were compared.

1. Farmer Managed Participatory Research (FAMPAR) trials with new varieties.
2. A control that is limited to public sector extension activity.

The sources for the new material were the national and state released cultivars. Advanced generation lines/pre-released varieties from ICRISAT and NRCS, and co-operating breeders were also the source of new materials.

A simple method of Farmer Participatory Research (FPR) was used in which Farmer Managed Participatory Research (FAMPAR) trials were conducted. In FAMPAR trials, farmers grew new varieties alongside their local variety and evaluated for cultivar traits. A single new cultivar was randomly given to a participating farmer for FAMPAR trial. There were at least 3 replications in a village with three farmers for every variety. The total number of farmers involved measured in hundreds, but a reasonably large sample (20) per village were used for detailed surveys and monitoring adoption of varieties.

Besides the technical programme, the schedules were prepared and circulated for the collection of data from farmers under the DFID project on the farmer's participatory varietal selection in *rabi* sorghum. Schedules for village statistics (Schedule-I), basic information of farm families (Schedule II), bench mark survey of farm families (Schedule III), proforma for farm family plan (Schedule IV) were given to NGOs for collection of data ( **Annexure-I**). All the information was recorded by respective NGOs and they are maintained in the research stations.

## 2.2. Trial design

Each of the six NGOs selected three villages, each with a minimum of six participating farmers. The number of varieties tested by each NGO ranged from 6 to 15. The NGOs in consultation with farmers decided to give each farmer 2 kg seed of each entry for the Farmer Managed Participatory Research (FAMPAR) Adaptive Varietal trials and 1 kg seed of each entry for FAMPAR Initial Varietal trials. However, involving more farmers by providing each of them with less seed was considered a more appropriate design. Each genotype was tested by three farmers to represent three replications. A trial consisted of growing the new cultivar alongside the local cultivar in a similar-sized plot without any plant protection and under farmer management. Observations on grain yield, dry fodder yield, grain appearance, and farmer-preferred traits (for male and female farmers) were recorded. Farm walks, focus-group discussions, and house-level questionnaires were employed.

Based on the discussions in the yearly meetings, the technical programmes for the Farmer Managed Participatory Research (FAMPAR) Adaptive and Initial Varietal trials from *Rabi* 1999-2000 to 2001-2002 are detailed in Tables 1 to 7.

## 2.3. Technical Programmes of Farmer Managed Participatory Research (FAMPAR) Trials

### First Year: *Rabi* 1999-2000

**Table 1:- FAMPAR Adaptive Varietal Trial-1: 1999-2000**

SI No	Entry	No. of NGO's	Seed per NGO (Kg)	To be tested at	Seed per farmer (Kg)	No. of trials per NGO	Total no. of trials
1	SPV-1359	6	80	All centres	2	40	240
2	SPV-1380	6	80	All centres	2	40	240
3	SPV-1155	6	30	All centres	2	15	90
4	CSH-15R	6	20	All centres	2	10	60
5	M35-1	6	20	All centres	2	10	60

**All Centres : Solapur, Bijapur, Rahuri, Parbhani, Dharwad and Hyderabad**

**Table 2 : FAMPAR Initial Varietal Trial: 1999-2000**

SI No	Entry	No. of NGO's	Seed per NGO (Kg)	To be tested at	Seed per farmer (Kg)	No. of trials per NGO	Total no. of trials
1	RSLG 262	5	6	S,N,R,B,D	1	6	30
2	SPV 655	2	20	P,S	1	20	40
3	SPV 1411	4	10	S,N,R,P	1	10	40
4	SPV 1413	3	7	R,S,P	1	7	21
5	BRJ 356	5	5	S,B,N,D,P	1	5	25
6	SPV 1462	6	5	All centres	1	5	30
7	SPV 1463	6	5	All centres	1	5	30
8	M 35-1	6	20	All centres	2	10	60

**S=Solapur; N=NRCS; R=Rahuri; B=Bijapur; D= Dharwad; P=Parbhani**

## Second Year: *Rabi* 2000-2001

**Table 3: FAMPAR Adaptive Varietal Trial: 2000-2001**

Sl No	Entry	No. of NGO's	Seed per NGO (Kg)	To be tested at	Seed per farmer (Kg)	No. of trials per NGO	Total no. of trials
1	SPV 1359	6	80	All centres	2	40	240
2	SPV 1380	5	80	All centres Except Dhulia	2	40	200
3	SPV 1155	6	60	All centres	2	30	180
4	RSLG 262 (Mauli)	6	80	All centres	2	40	240
5	SPV 1411	6	32	All centres	2	16	96
6	SPV 655	2	40	Solapur	2	20	40
7	SPV 1463	1	80	Parbhani	2	40	40
8	BRJ 356	1	80	Bijapur	2	40	40
9	M 35-1	1	80	Dharwad	2	40	40

**Table 4: FAMPAR Initial Varietal Trial: 2000-2001**

Sl No	Entry	No. of NGO's	Seed per NGO (Kg)	To be tested at	Seed per farmer (Kg)	No. of trials per NGO	Total no. of trials
<b>Shallow</b>							
1	CRS 2	2	12	Solapur, Bijapur	2	6	12
2	Bidar Local	2	10	Solapur, Bijapur	2	5	10
<b>Medium Deep</b>							
3	SPV 655	2	12	Dharwad, Bijapur	2	6	12
4	SPV 1502	6	12	All centres	2	6	36
5	SPV 1457	6	12	All centres	2	6	36
6	SPV 1463	5	12	All centres except Parbhani	2	6	30

7	SPV 1490	5	12	All centres except Hyd	2	6	30
8	SPV 1492	5	8	Hyd-2 trials Others-5 each	2	4	20
9	SPV 1491	2	12	Rahuri, Bijapur	2	6	12
10	BRJ 358	2	10	Bijapur, Solapur	2	5	10
11	GRC 15	2	10	Bijapur, Solapur	2	5	10
12	RSV 143	2	12	Dhulia, Solapur	2	6	12
13	RSV 170	2	12	Dhulia, Solapur	2	6	12

### Third Year: Rabi 2001-2002

**Table: 5 Mother Trial: 2001-2002**

Sl No	Entry	No. of NGO's	Seed per NGO (Kg)	To be tested at	No. of Mother Trials/NGO	Seed per farmer (Kg)	Total no of trials
1.	SPV 1359	6	12	All Centres	12	1	72
2.	SPV 1155	6	12	All Centres	12	1	72
3.	SPV 1411	6	12	All Centres	12	1	72
4.	CSV 14R	6	12	All Centres	12	1	72
5.	SPV 1457	5	12	Dharwad, Solapur, Dhulia, Hyderabad, Parbhani	12	1	60
	RSLG 262	2	12	Solapur, Bijapur	12	1	24
6.	Farmers Variety	6	12	All Centres	12	1	72

Methodology: All entries were planted together in a single trial in a uniform field and should be randomized from one farmer trial to other one.

Plot size : ¼ acre

No. of Farmer Repl.: 12 trials (3 farmers x 4 villages)

Management: Farmers own management (Data was recorded on farmer's method of management)

Border rows: Both sides were sown by farmer grown variety as check.

Method of harvest: Actual measurement of plot harvested was recorded.

Bundling and stacking. Average weight of 10 bundles after 10 days, that are randomly selected.

**Table 6: Baby Trial -1 (Adaptive Varietal Trial): 2001-2002**

Methodology : 1 improved variety + 1 Farmer grown variety

Plot size : ½ acre each

Management: Farmers own management (Data was recorded on farmer's method of management)

Sl No	Entry	No. of NGO's	Seed per NGO (Kg)	To be tested at	No. of Trials/NGO	Seed per farmer (Kg)	Total no of trials
1.	SPV 1359	6	56	All Centres	28	2	168
2.	SPV 1155	6	8	All Centres	4	2	24
3.	SPV 1411	6	8	All Centres	4	2	24
4.	CSV 14R	6	56	All Centres	28	2	168
5.	SPV-655	2	10	Solapur, Parbhani	5	2	10
6.	SPV-1457	5	56	Parbhani, Dhulia, Solapur, Dharwad, Hyd	28	2	140
7.	SPV-1380	2	80	Bijapur, Dharwad	40	2	80
8.	RSLG-262	4	26	Solapur, Dhulia, Bijapur, Hyd	13	2	52
9.	CRS-2	1	30	Solapur	15	2	15

Border rows: Both sides were sown by farmer grown variety as check.

Method of harvest: Actual measurements of plot harvested were recorded.

Bundling and stacking. Average weight of 10 bundles after 10 days, that are randomly selected.

**Table 7: Baby Trial -II (Initial Varietal Trial): 2001-2002**

Sl No	Entry	No. of NGO's	Seed per NGO (Kg)	To be tested at	Seed per Farmer (Kg)	No. of Trials/NGO	Total no of trials
1	RSV-351	6	12	All NGO / Centres	2	6	36
2	SPV-1503	6	12	All NGO / Centres	2	6	36
3	SPV-1546	6	12	All NGO / Centres	2	6	36
4	Gund Jola	5	12	Solapur, Dhulia, Hyd, Dharwad, Bijapur	2	5	25
5	Halejola	5	10	Solapur, Dhulia, Hyd, Dharwad, Bijapur	2	5	25
6	SPV-1550	5	10	Parbhani, Solapur, Bijapur, Dhar.Dhulia	2	4	20
7	GRC-17-1	2	12	Bijapur, Dhulia	2	6	12
8	JP-1-1-5	2	12	B:ijapur, Dhulia	2	6	12
9	SPV-1555	2	12	Solapur, Parbhani	2	6	12
10	Dagadi Sol	2	12	Parbahani, Dharwad	2	6	12
11	Gida Maldandi	2	12	Parbhani, Dharwad	2	6	12
12	SPV-1452	1	12	Parbhani	2	6	6
13	CRS-1	1	12	Solaupr	2	6	6
14	SPV-1556	1	12	Solapur	2	6	6
15	SPV-1494	1	10	Parbhani	2	5	5



### 3. Research Activities

The project was proposed through the Indian Council of Agricultural Research (ICAR). The implementing agency is National Research Centre for Sorghum, Rajendranagar, Hyderabad and its collaborators. The participating agency from the UK is the Centre for Arid Zone Studies, University of Wales. Bangor , which has an international reputation in participatory plant breeding research.

The research activities were carried out in three states of Maharashtra, Andhra Pradesh and Karnataka where *rabi* sorghum is grown on a sizable area of 5.42 m ha out of a total area of 5.6 m ha. Therefore, project locations were identified in each of these states, which are as follows:

Andhra Pradesh: Medak (NRCS and ICRISAT)  
Maharashtra : Solapur, Dhule(Rahuri centre), and Parbhani  
Karnataka: Bijapur and Dharwad

The soil types for different NGO's were finalized as below:

Bijapur/Solapur	:	Shallow, Medium, Deep and Irrigated
Dharwad	:	Medium, Deep and Irrigated
Parbhani	:	Medium, Deep and Irrigated
AP (Hyderabad)	:	All types of soil except irrigated

All these sites have centres of the All India Coordinated Sorghum Improvement Project of ICAR located in state agricultural universities (SAUs). Six non-governmental organizations (NGOs), six centers of the All India Co-ordinated Sorghum Improvement Project (AICSIP) located SAUs, the National Research Centre for Sorghum (NRCS), and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) collaborated in the research. The scientists collaborated are :

1. Dr. BS Rana., Principal Investigator of DFID and Director. NRCS, Hyderabad
2. Dr. (Mrs.). SL Kaul. Co-PI of DFID, NRCS, Hyderabad.
3. Dr. BN Narkhede, Sr. Sorghum Breeder, MPKV, Agricultural University, Rahuri-413722 (MS).
4. Dr. ST Borikar Sr. Sorghum Breeder, MAU, Parbhani- 413402
5. Dr. NY Nayakar, Sr. Sorghum Breeder, UAS, Main Sorghum Research Station, Dharwad-580005 Karnataka.
6. Dr BD Biradar, Sr. Sorghum Breeder and Dr. MS Patil; Sr. Sorghum Breeder, Agricultural Research station, UAS, Bijapur-586101 Karnataka.
7. Dr. Prabhakar, Sr. Scientist, Centre on *Rabi* Sorghum, NH No:9, Bypass, Shelgi, Solapur-413006
8. Dr. Belum S. Reddy, Sr. Sorghum Breeder, ICRISAT, Pattancheru-502324, AP
9. Dr.Appaji Chari, Sr. Scientist (EXT.), NRCS, Hyderabad.

10. The officer-in-charge, KVK, Agricultural Research Station, Dhule-424004, (MS)
11. The chairman, KVK, Jeevan Jyothi charitable trust, Bhagya Laxmi Nagar, Basmatu Road, Parbhani-431402
12. The Director, Institute for Studies on Agriculture and Rural Development, (ISARD), Belgaum road, Dharwad-580008, Karnataka.
13. The Secretary, Association for Studies on Agricultural and Rural Development (ASEARD), Saraswath Sadan Nehrunagar, Behind KSRTC Guest house, Bijapur-586101, Karnataka.
14. The Chairman, KVK, Shri Siddeshwar, Krishi Vigyan Prasarak Samstha, 92 A/2, Bhawanipith, Solapur-413002, MS.
15. The Chairman, Maharshi Vivekanand Samaj Kalyan Santhan, Akkalkot, Solapur (District), MS.
16. Deccan Development Society, Hyderabad
17. Director CESC (Centre for Environment And Development), Flat No: 201, Sri Balagji homes, East Maredpally, Secunderabad-500026

The activities involved the identification of villages, NGO user groups and farmers in those villages, and conduct of rapid rural appraisals (RRA) to identify which varieties farmers cultivated and how they cultivated them, as well as to assess constraints to productivity. Farmer-managed trials of 10 or more identified elite varieties, hybrids, and selected local control varieties were conducted by farmers on their fields. Joint monitoring by researchers and farmers was done at a minimum of three crop stages, and data were collected on the performance of the entries. Before the *rabi* sowing, the NGOs selected the participating farmers by organizing group discussions that included both farmers and officials.

#### 4. Outputs:

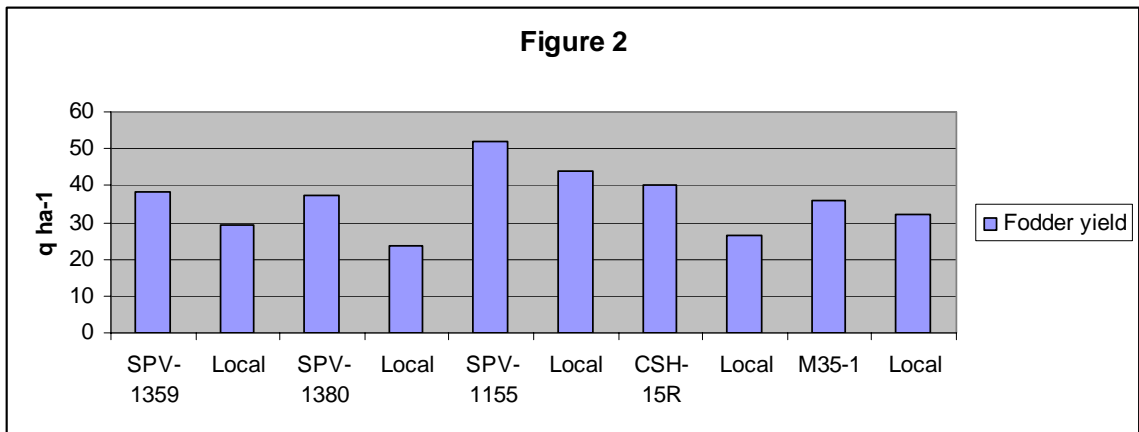
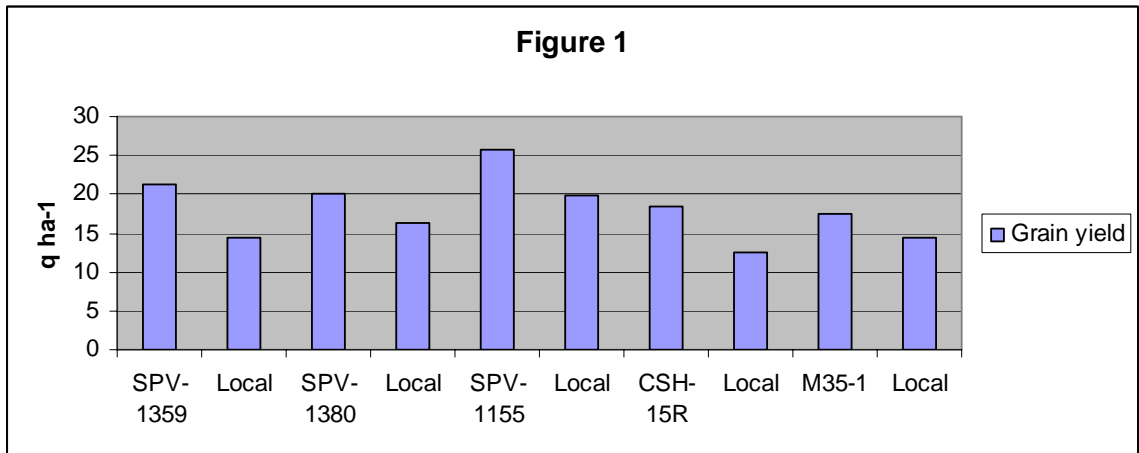
As per the technical programme decided every year, FAMPAR trials were conducted by all the centers with the help of NGO's. The number of trials successfully conducted by various centers against the allotted is detailed in the **Annexure -II**. Also highlights of research progress year-wise and centre-wise are presented in **Annexure-III**. The improved varieties tested in farmer fields every year were pooled and mean yields are tabulated in Tables 8 to 15.

#### First year: *Rabi* 1999-2000

**FARMPAR Adaptive Varietal Trial:** Four varieties and one hybrid were tested in this trial. The mean grain yields ranged from 17.56 q ha<sup>-1</sup> (M35-1) to 25.70 q ha<sup>-1</sup> (SPV-1155). The percent increase over local was higher (48.46%) in case of SPV 1359 followed by CSH-15R (46.32%). A maximum fodder yield of 52.10 q ha<sup>-1</sup> was recorded in the variety SPV-1155, followed by CSH-15R (40.0 q ha<sup>-1</sup>). However, the percent increase over local in fodder yield was the highest (58.85 q ha<sup>-1</sup>) in SPV-1380 (Table 8, Figures 1 and 2).

**Table 8: FAMPAR Adaptive Varietal Trial-1(1999-2000): Mean Performance of High Yielding Varieties (HYV) against locals for characters across locations**

Sl No	Entry	No of trials	Days to maturity (No.)	Grain yield (GY) (q ha <sup>-1</sup> )	% increase over Local	Fodder yield (q ha <sup>-1</sup> )	% increase over Local	t-value for GY
1	SPV- 1359 Local	180	126 121	21.26 14.32	48.46	38.10 29.38	29.68	3.61**
2	SPV-1380 Local	182	122 120	20.15 16.21	24.30	37.52 23.62	58.85	2.23**
3	SPV-1155 Local	68	119 123	25.70 19.73	30.25	52.10 43.91	18.65	3.31**
4	CSH-15R Local	96	120 125	18.48 12.63	46.32	40.00 26.42	51.40	4.43**
5	M35-1 Local	41	121 125	17.56 14.36	22.28	36.13 32.36	11.65	1.83*



**FAMPAR Initial Varietal Trial:** Data were available for 6 varieties in this trial. The grain yields ranged from 12.80 q ha<sup>-1</sup> in SPV-1462 to 28.60 q ha<sup>-1</sup> SPV-655 and fodder yields from 32.73 q ha<sup>-1</sup>(BRJ-356) to 60.10 q ha<sup>-1</sup> (SPV-1413). The percent increase over local for grain yield was highest in variety SPV-1413 (59.31%) with SPV-1462 (-10.49%) showing less than the locals. In case of fodder yield, the maximum percent increase was in case of SPV-655 (74.77%). However, varieties SPV-1462 (45.63%) and RSLG-262 (44.22%) exhibited significant improvement over their locals (Table 9).

**Table 9: FAMPAR Initial Varietal Trial (1999-2000): Mean Performance of High Yielding Varieties (HYV) against locals for characters across locations**

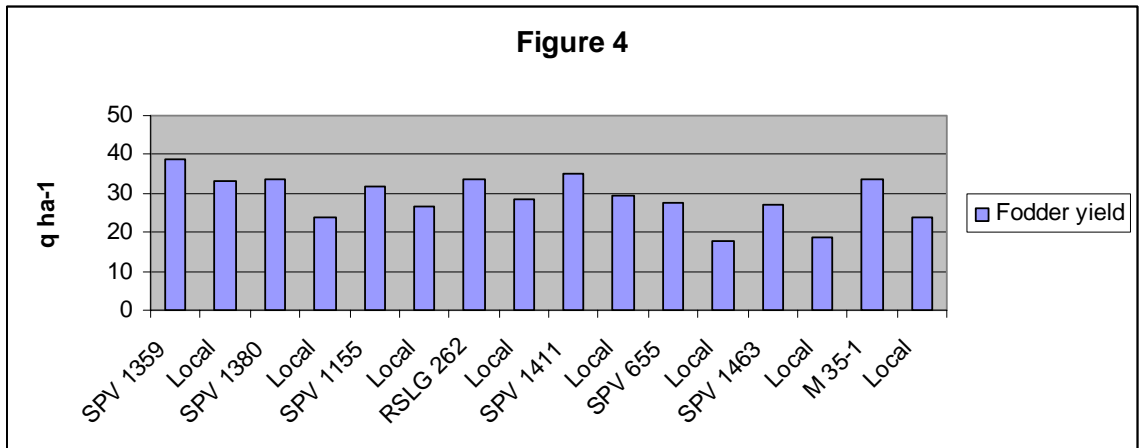
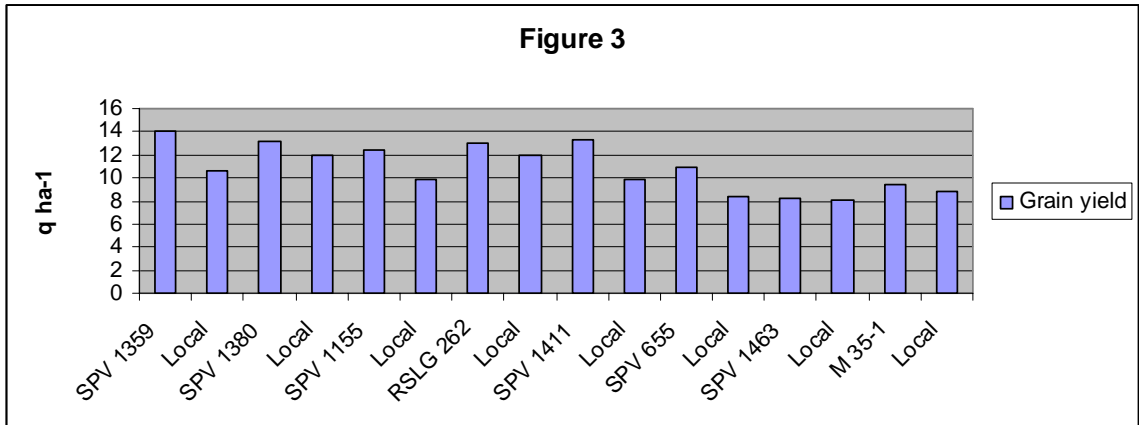
Sl No	Entry	No of trials	Days to maturity (No.)	Grain yield (GY) (q ha <sup>-1</sup> )	% increase over Local	Fodder yield (q ha <sup>-1</sup> )	% increase over Local	t-value for (GY)
1	RSLG 262 Local	19	116 121	19.15 15.86	20.74	42.40 29.40	44.22	1.73
2	SPV 655 Local	40	119 122	28.60 20.98	36.32	56.75 32.47	74.77	3.11**
3	SPV 1411 Local	28	121 120	20.65 16.46	25.45	45.60 28.03	62.68	4.53**
4	SPV 1413 Local	5	124 119	24.90 15.63	59.31	60.10 37.81	58.95	4.78**
5	BRJ 356 Local	17	120 125	15.36 13.49	13.86	32.73 24.92	31.34	0.98
6	SPV 1462 Local	22	118 126	12.80 14.30	-10.49	54.70 37.56	45.63	0.63

**Second year: Rabi 2000-2001**

**FAMPAR Adaptive Trial:** Out of 9 varieties, results are available for 8 varieties except variety BRJ-356. The grain yields in varieties ranged from 8.27 q ha<sup>-1</sup> (SPV-1463) to 14.01 q ha<sup>-1</sup> (SPV 1359). The percent increase over local was highest in case of variety SPV-1411 (35.17%). Fodder yields ranged from 27.20 q ha<sup>-1</sup> (SPV-1463) to 38.65 q ha<sup>-1</sup> (SPV-1359). However, the percent increase over local was maximum in case of variety SPV-655 (55.63%). Besides, the varieties SPV-1463, M35-1 and SPV-1380 also gave significantly higher fodder yields than respective locals (Table 10, Figures 3 and 4).

**Table 10: FAMPAR Adaptive Varietal Trial (2000-2001): Mean Performance of High Yielding Varieties (HYV) against locals for characters across locations**

Sl No	Entry	No of trials	Days to maturity (No.)	Grain yield (GY) (q ha <sup>-1</sup> )	% increase over Local	Fodder yield (q ha <sup>-1</sup> )	% increase over Local	t-value for GY
1	SPV 1359 Local	206	127 123	14.01 10.68	31.17	38.65 33.08	16.84	2.83**
2	SPV 1380 Local	93	124 121	13.15 11.99	9.67	33.80 23.86	41.65	0.48
3	SPV 1155 Local	128	121 120	12.45 9.87	26.13	31.80 26.54	19.82	1.97*
4	RSLG 262 Local	123	117 125	13.03 11.93	9.22	33.43 28.68	16.56	0.93
5	SPV 1411 Local	64	120 126	13.25 9.92	33.57	35.17 29.55	19.01	2.88**
6	SPV 655 Local	34	120 123	10.90 8.39	29.92	27.50 17.67	55.63	2.53**
7	SPV 1463 Local	34	122 121	8.27 8.02	3.12	27.20 18.47	47.26	0.13
8	M 35-1 Local	22	122 123	9.36 8.78	6.60	33.78 23.98	40.87	0.26



**FAMPAR Initial Varietal Trial:** Out of 13 varieties tested in this trial, data are available for 9 varieties. Generally, the grain and fodder yields were low. Grain and fodder yields ranged from 5.1 q ha<sup>-1</sup> (RSV-143) to 12.83 q ha<sup>-1</sup> (SPV-1463) and 14.37 (RSV-143) to 34.6 q ha<sup>-1</sup> (SPV-655). The percent increase over local for grain yield was highest in SPV-1463 (47.81%) and followed by 34.22% in SPV-655. For fodder yield, the percent increase over local was highest in SPV-1457 (60.61%), followed by SPV-655 (57.84%) and CRS-2 (57.38%) (Table 11).

**Table 11: FAMPAR Initial Varietal Trial (2000-2001): Mean Performance of High Yielding Varieties (HYV) against locals for characters across locations**

Sl No	Entry	No of trials	Days to maturity (No.)	Grain yield (GY) ( q ha <sup>-1</sup> )	% increase over Local	Fodder yield ( q ha <sup>-1</sup> )	% increase over Local	t-value for GY
1	CRS 2	10	118	7.80	21.68	22.05	57.38	1.83*
	Local		123	6.41		14.01		
2	SPV 655	9	120	12.55	34.22	34.60	57.84	2.92**
	Local		122	9.35		21.92		
3	SPV 1502	18	117	10.70	30.33	22.50	36.53	2.69**
	Local		125	8.21		16.48		
4	SPV 1457	24	121	12.30	4.86	31.56	60.61	0.53
	Local		123	11.73		19.65		
5	SPV 1463	15	117	12.83	47.81	32.06	37.71	3.58**
	Local		124	8.68		23.28		
6	SPV 1490	18	118	11.40	23.64	33.03	32.49	1.96*
	Local		121	9.22		24.93		
7	SPV 1492	12	120	8.71	24.96	20.00	21.28	2.28**
	Local		125	6.97		16.49		
8	RSV 143	10	122	5.1	-25.20	14.37	-11.29	0.23
	Local		123	6.82		16.20		
9	RSV 170	12	118	10.1	24.23	29.80	25.89	2.12
	Local		127	8.13		23.67		

### Third year: *Rabi* 2001-2002

The comments offered by Dr. DS Virk on the project, when he visited Solapur on 15-1-2001 and discussions with Dr. BS Rana at Hyderabad, the technical programme for *Rabi* 2001-2002 was modified. There were 3 trials viz. Mother Trial, Baby Trial-I (Adaptive Trial) and Baby Trial-II (Initial Varietal Trial) in the programme.

In Mother Trial, the varieties included were based on their good performance in the previous two years and also, they were in the pre-release stage. All the 6 varieties

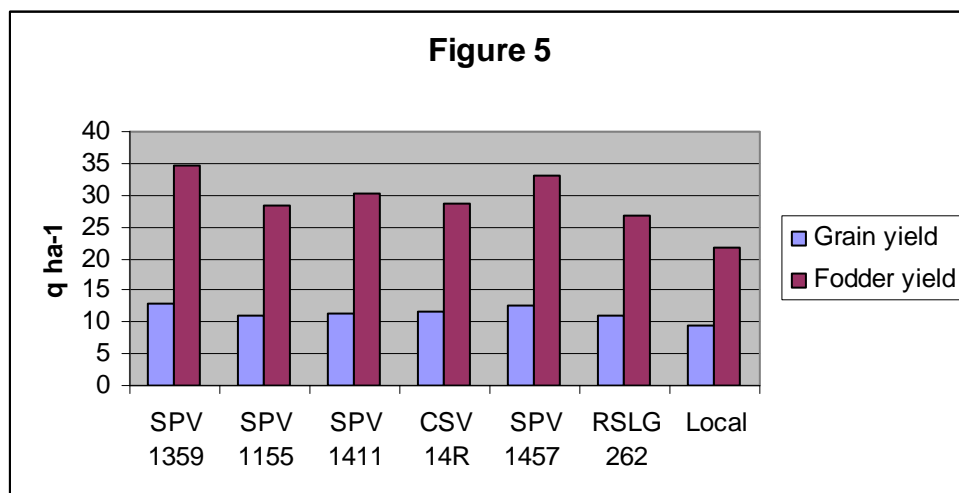


were planted together in a single trial in a uniform field and were randomized from one farmer trial to other one. However, the entries in Baby trial-I and II were conducted separately with locals.

**Mother Trial:** Generally, the grain and fodder yields were low. Grain and fodder yields were highest in CSV-216R (12.85 q ha<sup>-1</sup> and 34.61 q ha<sup>-1</sup>) and lowest in RSLG-262 (11.05 q ha<sup>-1</sup> and 26.80 q ha<sup>-1</sup>). The percent increase over farmer variety for grain and fodder yields were highest in CSV-216R (37.29% and 59.19%). However, varieties SPV-1457, SPV-1411, CSV-14R and SPV-1155 were significantly superior to farmer variety in fodder yield (Table 12 and Figure 5).

**Table 12. Mother Trial (2001-2002): Mean Performance of High Yielding Varieties (HYV) against locals for characters across locations**

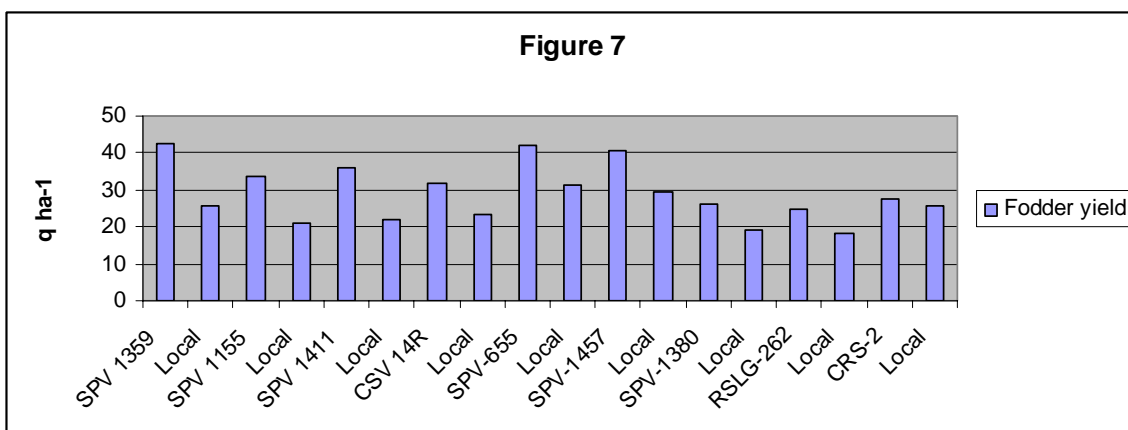
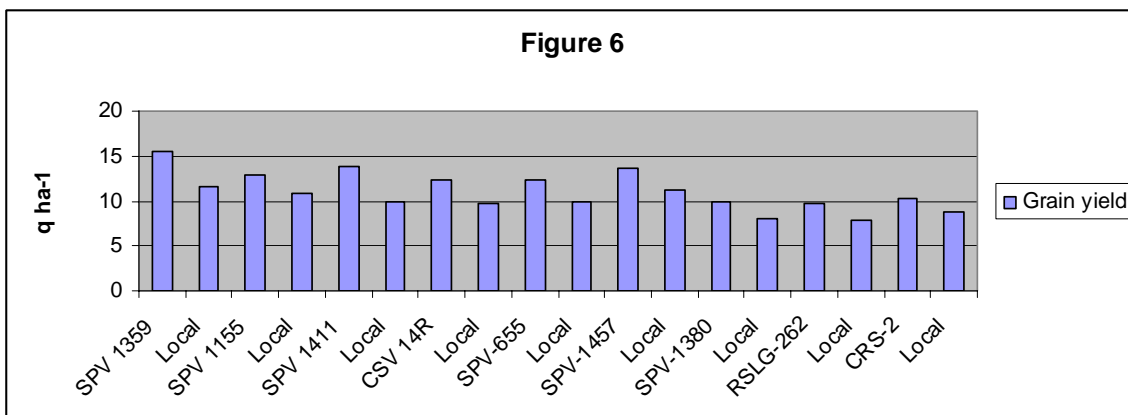
Sl No	Entry	No of trials	Days to maturity (No.)	Grain yield (GY) (q ha <sup>-1</sup> )	% increase over Local	Fodder yield (q ha <sup>-1</sup> )	% increase over Local	t-value for GY
1.	SPV 1359	68	125	12.85	37.29	34.61	59.19	5.46**
2.	SPV 1155	65	119	11.12	18.80	28.20	29.71	2.65**
3.	SPV 1411	66	120	11.48	22.64	30.20	38.91	3.01**
4.	CSV 14R	66	119	11.65	24.46	28.52	31.18	3.86**
5.	SPV 1457	54	122	12.52	33.76	33.22	52.80	4.65**
6.	RSLG 262	24	116	11.05	18.65	26.80	23.27	2.37**
7.	Farmer Variety	69	124	9.36	-	21.74	-	-



**Baby Trial-I (Adaptive Trial):** The variety SPV-1359 gave highest grain (15.47 q ha<sup>-1</sup>) and fodder yield (42.62 q ha<sup>-1</sup>). The percent increase over local ranged from 17.98% (CRS-2) to 40.46% (SPV-1411) and from 7.11% (CRS-2) to 67.33% (SPV 1359) for fodder yield. However, most of the varieties exhibited significant grain and fodder yield than the locals (Table 13, Figures 6 and 7).

**Table 13. Baby Trial -1 (Adaptive Varietal Trial) (2001-2002): Mean Performance of High Yielding Varieties (HYV) against locals for characters across locations**

Sl No	Entry	No of trials	Days to maturity (No.)	Grain yield (GY) (q ha <sup>-1</sup> )	% increase over Local	Fodder yield (q ha <sup>-1</sup> )	% increase over Local	t-value for GY
1.	SPV 1359 Local	131	126 125	15.47 11.67	32.56	42.62 25.47	67.33	5.63**
2.	SPV 1155 Local	21	120 123	12.89 10.83	19.02	33.68 21.05	60.01	3.08
3.	SPV 1411 Local	18	121 122	13.92 9.91	40.46	35.83 21.97	63.08	5.78**
4.	CSV 14R Local	113	120 126	12.25 9.63	27.20	31.75 23.48	35.22	3.91**
5.	SPV-655 Local	-	120 124	12.30 9.96	23.49	42.13 31.41	34.12	3.67**
6.	SPV-1457 Local	85	122 125	13.60 11.23	21.10	40.58 29.32	38.40	3.26**
7.	SPV-1380 Local	52	121 123	9.92 7.98	24.31	26.20 19.36	35.33	3.48**
8.	RSLG-262 Local	30	117 121	9.65 7.85	22.93	24.93 18.08	37.88	3.23**
9.	CRS-2 Local	12	118 126	10.30 8.73	17.98	27.70 25.86	7.11	2.68**



**Baby Trial-II (Initial Varietal Trial):** Out of 15 varieties tested, the data are not available for Gund Jola and SPV-1555. Here, some of the varieties tested were local land races. The grain yields ranged from 7.84 q ha<sup>-1</sup> (Hale Jola) to 17.50 q ha<sup>-1</sup> (SPV-1452) and fodder yields from 21.46 q ha<sup>-1</sup> (Hale Jola) to 47.16 q ha<sup>-1</sup> (SPV-1503). The percent increase over local was highest in SPV-1494 (48.86%) for grain yield and in SPV-1503 (75.38%) for fodder yield (Table 14).

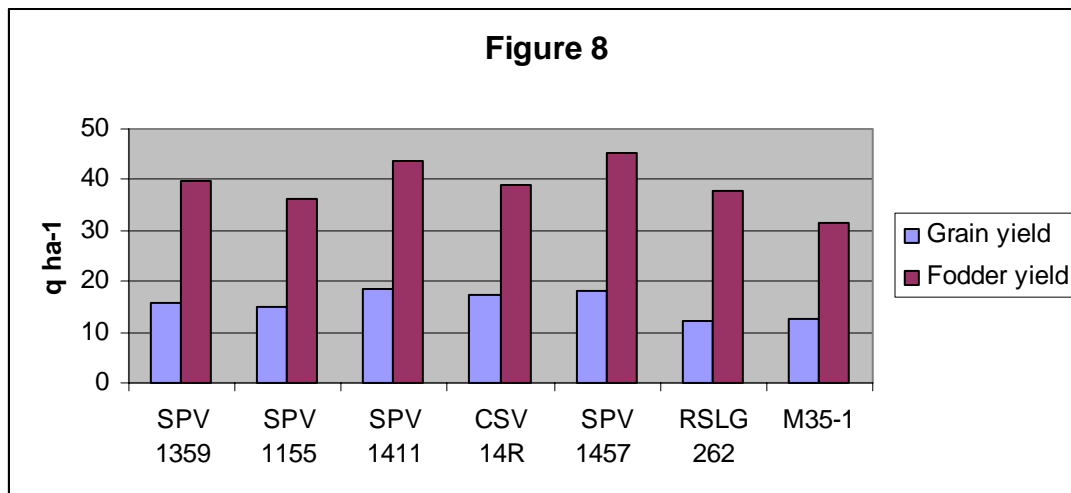
**Table 14: Baby Trial –II (Initial Varietal Trial) (2001-2002): Mean Performance of High Yielding Varieties (HYV) against locals for characters across locations**

Sl No	Entry	No of trials	Day to maturity (No.)	Grain yield (GY) (q ha <sup>-1</sup> )	% increase over Local	Fodder yield (q ha <sup>-1</sup> )	% increase over Local	t-value for GY
1	RSV-351 Local	21	119 123	13.65 10.47	30.37	39.15 23.51	66.52	5.31**
2	SPV-1503 Local	23	121 119	16.80 13.09	28.34	47.16 26.89	75.38	4.86**
3	SPV-1546 Local	21	123 125	16.13 12.73	26.71	47.13 32.62	44.48	4.32**
4	Halejola Local	10	121 123	7.84 8.35	-6.10	21.46 22.53	-4.75	1.37
5	SPV-1550 Local	12	119 125	14.26 12.69	12.37	39.76 29.96	32.71	1.23
6	GRC-17-1 Local	5	118 122	9.01 8.75	2.97	22.60 23.41	-3.46	0.63
7	JP-1-1-5 Local	5	118 121	11.30 9.31	21.37	29.15 28.32	29.31	3.03**
8	Dagadi Sol Local	11	121 125	16.01 13.83	15.76	41.60 30.83	34.93	2.73*
9	Gida Maldandi Local	11	118 120	14.10 12.63	11.64	38.80 29.63	30.94	1.38
10	SPV-1452 Local	6	120 122	17.50 14.96	16.97	52.30 42.43	23.26	1.83*
11	CRS-1 Local	5	115 123	10.60 7.64	38.74	24.80 23.67	4.77	4.99
12	SPV-1556 Local	4	117 121	8.02 6.71	19.52	25.70 19.46	32.06	2.68*
13	SPV-1494 Local	6	120 122	19.10 12.83	48.86	29.50 24.55	20.16	6.12**

The performance of high yielding varieties over locals for the elite lines, which were in pre-release stage (except CSV-14R, which is a released variety) were pooled over locations for all the three years and they were compared with M35-1, which is mostly cultivated variety in the *rabi* growing areas (Table 15 and Figure 8). From the results, it is evident that all the elite lines and CSV-14R gave yield increase over M 35-1 from 18.81% (SPV-1155) to 46.64% (SPV-1411) for grain yield. Fodder yield was the highest in SPV-1411. Except RSLG-262, all the varieties were superior to M 35-1.

**Table 15: Mean Performance of High Yielding Varieties (HYV) against locals for characters across locations over three years**

Sl No	Entry	No of trials	Day to maturity (No.)	Grain yield (q ha <sup>-1</sup> )	% increase over M35-1	Fodder yield (q ha <sup>-1</sup> )	% increase over M35-1
1.	SPV 1359	585	125	15.77	24.66	39.88	26.40.
2.	SPV 1155	282	120	15.03	18.81	36.11	14.45
3.	SPV 1411	176	120	18.55	46.64	43.89	39.11
4.	CSV 14R	179	121	17.22	36.13	38.91	23.33
5.	SPV 1457	163	119	18.23	44.11	45.11	42.98
6	RSLG 262	196	117	12.06	-4.66	37.99	20.41
7.	M35-1	59	120	12.65	--	31.55	--





SPV-1359  
Indo-UK Project Farmer Participatory Varietal Selection of Rabi Sorghum,  
in Kohir Mandal, Medak District

1) High yielding variety CSV 16 R



SPV-1155, Farmer with Standing Crop,  
Indo-UK Project Farmer Participatory Varietal Selection of Rabi Sorghum,  
in Kohir Mandal, Medak District

2) Farmers with panicles variety SPV-1155



3) High yielding rabi hybrid CSH 15R



4) Largely cultivated variety M35-1



5) High yielding variety RSLG 767 under shallow medium soils

#### 4.1. Evaluation of local germplasm

The local germplasm namely Hami Jogdi, Barshi Joot local, Ramdhe local, Gidda Maldandi Jola, Dagdi Solapur, Dood Mogra, Dagdi Parbhani, Yennigar Jola, Mudde moti jola, Madhabhavi local and Tandur local were contributed from different AICSIP centers for testing across locations in order to know their potentials for yield and resistance characters. The germplasm evaluation data from Parbhani and Rahuri centres are presented in Tables 16 and 17. In Parbhani, the six local germplasms showed significantly higher grain yield than M35-1 under highly protected and irrigated conditions. However, the locals could not out yield than SPV-1359(CSV-216R), CSH-15R and M35-1.

**Table 16: Evaluation of local germplasm during 2000-2001 (Irrigated) at Parbhani**

Sl No	Genotypes	Yield (Q/ha)		Days to 50% flowering	Plant height (cm)	Test Weight (g)
		Grain	Fodder			
1.	SPV-1411	55.47*	62.25*	78	215	39
2.	Dagdi Solapur	55.18*	32.09	85	194	28
3.	Gidda Maldandi	46.29*	29.62	89	123	25
4.	Harni Dagdi	43.70*	25.72	80	198	31
5.	Mudde Hatti Jola	41.47*	28.12	82	203	32
6.	Madbhavi local	39.99*	46.12	81	185	36

7.	Barshi Joot	39.77*	34.25	83	207	33
8.	Dood Mogra	35.18	48.14	80	198	29
9.	M35-1 (C )	34.22	47.12	79	210	36
10.	Dagdi Parbhani	33.70	49.12	82	195	32
11.	Tandur Local	33.33	61.17	89	212	31
12.	Yennigar Jola	29.62	36.10	97	203	35
13.	Ramkhel	17.55	27.15	85	210	31
	<b>C.D.(5%)</b>	<b>4.89</b>	<b>8.35</b>			
	<b>C.V.(%)</b>	<b>4.29</b>	<b>10.28</b>			

**Significant at 5%**

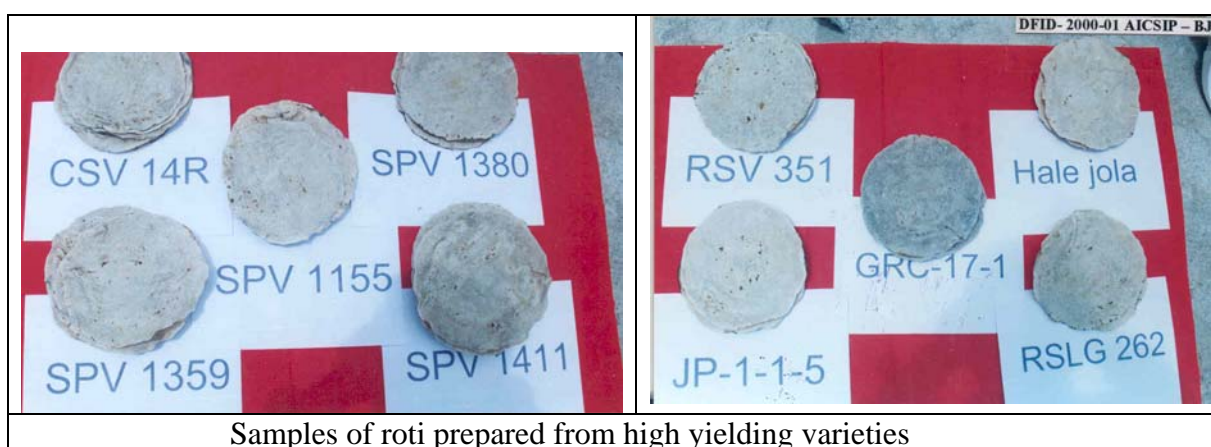
**Table 17: Evaluation of local germplasm during 2000-2001 (Irrigated) at Parbhani**

Sl No	Genotypes	Yield (Q/ha)		Days to 50% flowering	Plant height (cm)	Test Weight (g)
		Grain	Fodder			
1.	CSV-216R	4299	6283	77	207	36
2.	Dagdi Solapur	2116	7606	80	170	34
3.	Gidda Maldandi	529	1944	80	100	27
4.	Harni jogadi	1984	5622	75	169	33
5.	Mudde Moti Jola	2513	4961	70	182	37
6.	Madbhavi local	2513	4961	71	179	31
7.	Barshi Joot	2116	4299	73	195	38
8.	Dood Mogra	2116	2976	70	190	30
9.	M35-1	3770	6293	72	211	35
10.	Dagdi Parbhani	2381	6944	72	192	32
11.	Tandur Local	1918	6614	83	173	41
12.	Yennigar Jola	1653	5291	79	178	30
13.	Ramkhel local	2579	5622	74	193	35
	<b>C.D.(5%)</b>	<b>677</b>				



## 4.2. Farmer's response to quality parameters

Response (%) of farmers to different characters of HYV vs Local collected from various centers have been mentioned in **Annexure-IV**. The farmers reactions on plant height, threshability, grain size , grain colour, flour recovery, roti quality, keeping quality, farmer acceptability (both men and women) for high yielding varieties in comparison to locals are mentioned in detail. Generally, the farmers accepted the high yielding varieties in comparison to their locals with respect to characters such as plant height, threshability, grain size and grain colour. But, they gave different reactions to new improved varieties with respect to flour recovery, roti quality and keeping quality and were not convinced .Overall, both men and women accepted the high yielding varieties.



## 4.3. Quality analysis of *rabi* sorghum variety /hybrid (laboratory analysis)

Among the test varieties / hybrid, SPV-1359, SPV 1380 and DSH 4(station hybrid), which were preferred by farmers, were subjected to roti quality analysis with the help of scientists from Rural Home Science College and participatory farmers. The variety SPV-1380 was on par with M35-1 for its roti making quality parameters viz, dough banding property, roti spreading and puffing, whereas, variety SPV-1359 was found to be of poor quality with score of 3 for dough handling and roti spreading parameters and score of 2 for puffing quality (Table 18).The data suggested that, SPV-1380 was comparable with M35-1 for roti making quality, followed by DSH-4.

**Table 18: Roti making qualities**

Quality parameters	DSH 4	SPV-1380	SPV-1359	M35-1
Dough banding property scores*	2	1	3	1
Roti Spreading quality scores*	1	1	3	1
Puffing quality scores*	1	1	2	1

**Scores 1-3, \* 1 = Good, 2 = Fair, 3= Poor**

The flour of 4 genotypes was made to pass through sieves of different sizes from +60 to 100 (BSS Mesh size). The study indicated that, the variety SPV-1380 stood first for flour recovery followed by M35-1 and DSH-4, SPV-1359 recorded the lowest flour recovery (Table 19)

**Table 19. Percentage of particle size distribution of flour when passed through different sieves (100g flour)**

Sl No	Varieties	Sieve size			
		+60	+80	+100	-100
1.	DSH-4 (g)	14.69	12.82	10.97	61.52
2.	SPV-1380 (g)	17.12	13.98	14.24	54.66
3.	SPV- 1359 (g)	12.93	10.18	10.10	66.79
4.	M35-1 (g)	12.36	13.90	12.02	61.72

Organoleptic evaluation of roti was conducted for both fresh and one day old roties. The result showed that M35-1 was top with respect to overall acceptability of fresh roties followed by DSH-4, SPV-1380 and SPV-1359 .When test conducted on one day old roti, again M35-1 was the best for organoleptic evaluation (Table 20).

From the results it is concluded that for organoleptic evaluation of both fresh and one day old roties, M35-1 was the best. The hybrid DSH-4 and SPV-1380 were found to be very close to M35-1. But the variety SPV-1359 had the least scores in organoleptic evaluation and also found to possess poor keeping quality.

**Table 20: Organoleptic evaluation of roti prepared with different variety of Rabi Sorghum (N=6)**

**(i) Fresh roties**

Varieties	Appearance	Taste	Flavour	Overall acceptability
DSH-4	2.6	3	2.6	3
SPV-1380	2.8	2.8	2.4	2.8
SPV- 1359	2.5	2.5	2.25	2.5
M35-1	2.75	2.75	2.5	3.25

**(ii) One day old roties**

Varieties	Appearance	Taste	Flavour	Overall acceptability
DSH-4	2.5	2.8	2.5	2.8
SPV-1380	2.5	2.16	2.0	3.16
SPV- 1359	2.4	2.0	2.0	2.6
M35-1	2.6	2.4	2.6	3.4

**\* 4 point scale: Excellent =4, Good=3, Fair=2, Poor-1**

#### 4.4. Extension activities

- i. Various extension activities were organized at different centres. The training programmes on use of high yielding varieties (HYV) of *rabi* sorghum and improved crop production techniques for *rabi* sorghum under rain fed conditions were arranged at respective research stations. Besides, group meetings, farm walks and field days were conducted during the cropping period (**Annexure-V**).
- ii. Farmers reactions to the varieties tested under Farmer Managed Participatory Research (FAMPAR) Trials during 1999-2000 to 2001-2002 are mentioned in **Annexure-VI**. Farmers showed good response to the programme and were convinced of the new material being tested, which eventually performed better than their locals. Focused group discussions were held in all the villages.
- iii. The exposure visits of farmers to respective organizing centers were undertaken with the help of NGOs. Farmers of many villages visited trials in other villages and were generally enthusiastic of their participation in this project. News coverage of the field days conducted at various locations was also attended (**Annexure-VII**).
- iv. Informations on the market survey in Phase-I and Phase-II at different locations were collected by respective centres (**Annexure-VIII**)



**Demonstration of high yielding varieties SPV 1380 & CSV 216R (SPV 1359)**

#### 4.5. Monitoring of FAMPAR trials

The FAMPAR trials were monitored every year and a sample report of the Monitoring team of FAMPAR trials during 2001-2002 is given in detail in **Annexure-IX**.

Dr. D.S.Virk, DFID, UK visited and monitored the Farmers Participatory Varietal Selection trials at Tandulwadi village on 15-1-2001. He was happy to see the *rabi* sorghum Farmers Participatory Varietal Selection trials and interacted with the farmers in the village. He expressed satisfaction on the methods followed in conduct of trials and selection of the farmers. He advised the farmers to see one another's trials and give their opinions on the grain and fodder quality of the improved varieties in comparison to locals. He suggested NGOs and Scientists to gather information on the spread of cultivars in the village.



**Dr. D.S. Virk, discussing with scientists and NGO's,  
Musti Village, Solapur district.**

#### 4.6. Impact of the Farmers Participatory Varietal Selection in *Rabi Sorghum*

The project paved way for the demonstrations of large number of genetic materials developed at various centres in farmer's fields on a large scale and thereby identification of farmer preferred varieties (SPV -1359, SPV-1380, SPV-1411, SPV-1155, and RSLG-262) not only in the project area but also in the neighboring states where the sorghum is being cultivated. The data generated in the project have been used as additional information for the release of the three cultivars preferred by the farmers namely, SPV-1359 as CSV-216R (Phule Yashoda) at the national level, and RSLG-262 as Mauli for the shallow soil areas and SPV-1411 as Parbhani Moti for medium to deep soils and under rain fed conditions of Maharashtra state. These cultivars were adopted by farmers and seeds were multiplied. The salient features of three cultivars along with M35-1 are given below.

**Table 21: Salient features of farmer preferred cultivars**

Sl No	Characters	CSV-216R (SPV -1359) Phule Yashoda	Parbhani Moti (SPV-1411)	Mauli (RSLG-262)	M 35-1
1	Origin	Rahuri	Parbhani	Rahuri	Mohol
2	Pedigree	Selection from Dhulia germplasm	Selection from GD 31-4-2-3	Land race selection	Selection from Maldandi bulk
3	Year of release	2000	2003	2002	1935 1969(again released officially)
4	Leaf color	Dark green	Green	Light green	Green
5	Leaf sheath pigmentation	Purple (Non-tan)	Purple (Non-tan)	Purple (Non-tan)	Purple (Non-tan)
6	Leaf orientation	Drooping	Drooping	Drooping	Drooping
7	Leaf midrib colour	White	Light green	Light green	Light green
8	Ear head compactness	Semi compact	Semi compact	Semi compact	Semi compact
9	Ear head shape	Cylindrical	Oval	Oval	Oval
10	Plant height (cm)	245-250	200-225	180-200	175-180
11	Stem	Medium thick	Medium thick	Medium thick	Medium thick
12	Grain colour	Pearly white	Pearly white	Pearly white	Pearly white
13	Grain size	Bold	Bold	Bold	Bold
14	Grain shape	Round	Round	Round	Round
15	Grain lustre	Lustre	Lustre	Lustre	Lustre
16	1000 seed weight (g)	36	32	34	32
17	Grain yield (q ha <sup>-1</sup> )	23-28	22-26	20-22	18-21
18	Fodder yield (q ha <sup>-1</sup> )	72-75	58-60	45-50	53-56
19	Special Features	Tolerant to shoot fly and charcoal rot	Tolerant to shoot fly and charcoal rot ,responsive to fertilizers	Tolerant to shoot fly , charcoal rot and drought	Tolerant to shoot fly, charcoal rot and drought.
20	Area of adaptation	Rainfed areas (medium to deep soils) and under irrigated conditions of Maharashtra, Karnataka and AP	Rainfed areas (medium to deep soils) of Maharashtra,	Rainfed areas (shallow to medium soils) of Maharashtra	Rainfed areas (medium to deep soils) of Maharashtra, Karnataka and Andhra Pradesh

#### **4.7. Proceedings of Planning Workshop held at Centre for Arid Zone Studies, University of Wales, United Kingdom from 22 to 30 August 1999**

A project planning workshop was organized at Centre for Arid Zone Studies (CAZS), University of Wales, Bangor, U.K. from 22 to 30 August, 1999 for finalizing the details of activities and approaches of participatory varietal selection and to enable Indian Scientists to efficiently implement the Indo-British Collaborative Project on “Participatory Varietal Selection in *Rabi* Sorghum” funded by DFID Plant Sciences Research Programme. This project has been implemented at seven centres under the leadership of Dr.B.S.Rana, Director, NRC for Sorghum, Hyderabad for a period of three years from 1 July 1999. The scientific / technical deliberations of the workshop are mentioned in detail in **Annexure-X**

#### **4.8. Significant contributions of the project**

- Available elite varieties (SPV -1359, SPV-1380, SPV-1411, SPV-1155, RSLG-262) and advanced generation genotypes (SPV1413, SPV-1462, SPV-1463, SPV-1452, SPV-1457, SPV-1490, SPV-1492, SPV-1493, SPV,1502, SPV-1503, SPV-1550, SPV-1555, SPV-1556, SPV-1494, CRS-1,CRS-2, BRJ-356,GRC-15,RSV-143, RSV-170, ,JP1-1-5, GRC-17-1,M35-1),were provided to the farmers for selection and adoption under a wide spectrum of socio-economic environments.
- The project has helped in identification of traits preferred by farmers (Roti quality characters and resistance to biotic and abiotic stresses) could be incorporated in further breeding programmes.
- It has helped demonstrations of the genetic material developed in the farmer’s field on a large-scale and to identify the cultivars (SPV -1359, SPV-1380, SPV-1411, SPV-1155, RSLG-262) preferred by farmers.
- The data generated in the project have been used as additional information for the release of the three cultivars preferred by the farmers namely, SPV-1359 as CSV-216R(Phule Yashoda) at the national level, and RSLG-262 as Mauli for the shallow soil areas and SPV-1411 as Parbhani Moti for medium to deep soils and under rain fed conditions of Maharashtra state
- It has helped farmer to farmer spread of the farmer-preferred cultivars (SPV -1359, SPV-1380, SPV-1411, SPV-1155, and RSLG-262) not only in the project area but also in the neighboring states where the sorghum is being cultivated; further it has motivated the seed producing agencies.
- The project has led to the identification and prioritization of the problems associated with the acceptance/adoption of the improved cultivars by farmers, thus leading to research in the demand-driven areas of *rabi* sorghum-quality parameters.
- The local germplasm that was collected is now being used for assessment of the various parameters and in the breeding programmes.
- The socio-economic-psychological, technological factors of the farmers associated in the adoption of the improved cultivars are identified and efforts are now being made to incorporate such factors in the further studies.

## 5. Contribution of the outputs:

- The project has laid the foundation for demonstrating the farmer's participatory research methods that are effective in increasing both the cultivars diversity and replacement rates.
- The farmers have evaluated the different entries/population/selections in the farmer-managed trials, which led to identification of the farmer's preferred cultivars.
- The farmers preferred cultivars have spread not only in the project area, but also to the neighboring villages/districts where the *rabi* sorghum is being cultivated.
- The project has helped in the identification of three *rabi* genotypes (SPV-1359 as CSV-216R, RSLG-262 as Mauli and SPV-1411 as Parbhani Moti that have been preferred by the farmers, for their release under the national and state levels.
- The project has motivated the seed producing agencies for the production and distribution of the farmer's preferred cultivars tested under the farmers managed trials in the project.
- The project has contributed towards the collection of the local land races for conservation and utilization in the breeding programme.
- The incorporation of the farmers preferred traits like grain and fodder quality, flour recovery, threshability, roti quality, etc. in the future breeding programme is essential.
- The project has led to the identification of the various socio-psychological, technological factors associated in the adoption and diffusion of the farmers preferred cultivars.

## 6. Conclusions

Participatory varietal selection appears to be an effective approach to supplement plant breeding efforts in marginal areas, where progress with varietal adoption has been slow. The farmers evaluated the different entries/population/selections in the farmer-managed trials, which led to identification of the farmer's preferred cultivars. The farmers preferred cultivars have spread not only in the project area, but also to the neighboring villages/districts where the *rabi* sorghum is being cultivated. The incorporation of the farmers preferred traits like grain and fodder quality, flour recovery, threshability, roti quality, etc. in the future breeding programme is essential.

In contrast to the general belief that M35-1 is a popularly grown variety, access to NGOs and farmers revealed that various landraces are still grown in *rabi* sorghum growing areas in addition to M35-1. Improved varieties such as SPV -1359, SPV-1380, SPV-1411, SPV-1155 and RSLG-262 from the AICSIP advanced varietal trials, and SPV-655 performed excellently. The first three have already been released.. Thus, the varietal testing at the research station is usually, but not always, satisfactory to determine adaptability under realistic farmer management. Further PVS success will depend on newly evolved varieties, based on the farmers' perceptions learnt in these studies.

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**Schedules for the collection of data from farmers under the DFID project on the farmer's participatory varietal selection in *Rabi* sorghum**

**Population:** Village where the project was implemented. Information from both the participating and equal number of non participating farmers was collected. The schedules are duplicated as required for data collection.

**Schedule-I: Village statistics:** The schedule I deal with the general information of the village(s) where the project was implemented. The general information on the total area, irrigation sources, major crops, soil types, distance from the project area, farming situation, in the selected village, population of animals etc. were collected from the village leader/patwari .

**Schedule II: Basic information of farm families:** This schedule deals with the basic resources of the farm families in the village. This is consolidated information of the farm families in the village. This is based on the schedule III.

**Schedule III: Bench mark survey of farm families:** This schedule deals with the data to be collected from the individual farm families on their status on the date of the collection of the information. The data were collected from approximately about 5% of the total population in the village where the project was implemented. This schedule contains information collected on aspects like: land holdings; socio-economic status; cropping pattern, input use and output with its disposal, live stock enterprise; constraints experienced in the increasing Farm Production/Family income etc.

**Schedule IV: Proforma for farm family Plan:** This schedule pertains to the farm family plan of individual farmers. The information on the sources available; input requirement for each enterprise; calendar of operations for two years; estimated output from each enterprise; and assessment and production etc. for each of the family

**Details of FAMPAR trials****First Year: Rabi 1999-2000****FAMPAR ADAPTIVE TRIAL: 1999-2000**

Sl No	Entry	Trials Allotted per centre	Solapur	Bijapur	Dharwad	Rahuri	Parbhani	Hyderabad	No. of Trials conducted
1	SPV 1359	40	6	25	40	37	36	36	180
2	SPV 1380	40	40	30	40	40	32	--	182
3	SPV-1155	15	2	22	--	15	14	15	68
4	CSH 15R	10	25	14	10	29	8	10	96
5	M35-1	10	10	--	10	21	--	--	41

**FAMPAR INITIAL VARIETAL TRIAL: 1999-2000**

Sl No	Entry	No. of Trials allotted	Number of successful trials						No. of Trials conducted
			Solapur	Bijapur	Dharwad	Rahuri	Parbhani	Hyderabad	
1	RSLG 262	30	3	6	6	4	--	--	19
2	SPV 655	40	15	--	--	--	35	--	50
3	SPV 1411	40	15	--	--	3	10	--	28
4	SPV 1413	21	5	--	--	--	--	--	5
5	BRJ 356	25	3	3	5	--	6	--	17
6	SPV 1462	30	5	--	5	--	7	5	22
7	SPV 1463	30	1	--	--	--	5	--	6
8	M35-1	60	6	-	-	-	-	-	6

**Second Year: Rabi 2000-2001****FAMPAR ADAPTIVE TRIAL: 2000-2001**

Sl No	Entry	No. of Trials allotted	Number of successful trials						No. of Trials conducted
			Solapur	Bijapur	Dharwad	Rahuri	Parbhani	Hyderabad	
1	SPV -1359	240	31	57	50	32	36	--	206
2	SPV-1380	200	37	22	18	--	16	--	93
3	SPV-1155	180	27	27	22	30	22	--	128
4	RSLG-262	240	26	--	25	37	35	--	123
5	SPV-1411	96	13	16	7	15	13	--	64
6	SPV-655	45	17	--	--	--	17	--	34
7	SPV-1463	40	-	--	2	--	32	--	34
8	BRJ-356	40	--	--	--	--	--	--	--
9	M35-1	40	--	--	22	--	--	--	22

**FAMPAR INITIAL VARIETAL TRIAL:2000-2001**

Sl No	Entry	No. of Trials allotted	Number of successful trials						No. of Trials conducted
			Solapur	Bijapur	Dharwad	Rahuri	Parbhani	Hyderabad	
1	Shallow Soil CRS-2	12	5	5	--	--	--	--	10
2	Bidar local	10	--	--	--	--	--	--	--
3	Medium Soil SPV-655	12	--	6	3	--	--	--	9
4	SPV-1502	36	5	--	2	5	6	--	18
5	SPV-1457	36	5	3	4	6	6	--	24
6	SPV-1463	30	3	6	--	6	--	--	15
7	SPV-1490	30	4	2	3	6	3	--	18
8	SPV-1492	22	4	--	--	5	3	--	12
9	SPV-1491	12	--	--	--	6	--	--	6
10	BRJ-356	10	--	--	--	--	--	--	--
11	GRC-15	10	--	--	--	--	--	--	--
12	RSV-143	12	5	--	--	5	--	--	10
13	RSV-170	12	6	--	--	6	--	--	12

**Third Year: Rabi 2001-2002**

**Mother Trial: 2001-2002**

Sl No	Entry	No. of Trials allotted	Number of successful trials						No. of Trials conducted
			Solapur	Bijapur	Dharwad	Rahuri	Parbhani	Hyderabad	
1	SPV 1359	72	12	12	12	9	11	12	68
2	SPV 1155	72	12	12	12	9	10	10	65
3	SPV 1411	72	12	12	12	9	11	10	66
4	CSV 14R	72	12	12	12	9	9	12	66
5	SPV 1457	60	12	--	12	9	9	12	54
6	RSLG 262	24	12	12	--	--	--	--	24
7	Farmer Var	72	12	12	12	9	12	--	57

**Baby Trial –I (Adaptive Trial): 2001-2002**

Sl No	Entry	No. of Trials allotted	Number of successful trials						No. of Trials conducted
			Solapur	Bijapur	Dharwad	Rahuri	Parbhani	Hyderabad	
1	SPV 1359	168	23	23	20	22	20	23	131
2	SPV 1155	24	2	7	4	2	4	2	21
3	SPV 1411	24	3	4	4	3	4	--	18
4	CSV 14R	168	21	18	21	20	20	13	113
5	SPV 655	10	4	--	--	--	5	--	9
6	SPV 1457	140	23	--	20	21	20	1	85
7	SPV 1380	80	--	20	32	--	--	--	52
8	RLSG 262	52	11	10	--	9	--	--	30
9	CRS-2	15	12	--	--	--	--	--	12

**Baby Trial –II (Initial Varietal Trial): 2001-2002**

Sl No	Entry	No. of Trials allotted	Number of successful trials						No. of Trials conducted
			Solapur	Bijapur	Dharwad	Rahuri	Parbhani	Hyderabad	
1	RSV 351	36	5	2	3	5	6	--	21
2	SPV 1503	36	4	--	4	6	6	3	23
3	SPV 1546	36	4	--	3	5	6	3	21
4	Gund Jola	25	0	--	4	--	--	--	4
5	Hale Jola	25	4	2	2	2	--	--	10
6	SPV 1550	20	2	--	3	3	4	--	12
7	GRC-17-1	12	--	2	--	3	--	--	5
8	JP-1-1-5	12	--	2	--	3	--	--	5
9	SPV-1555	12	5	--	--	--	6	--	11
10	DM	12	--	--	5	--	6	--	11
11	GM	12	--	--	5	--	6	--	11
12	SPV-1452	6	--	--	--	--	6	--	6
13	CRS-1	6	5	--	--	--	--	--	5
14	SPV-1556	6	4	--	--	--	--	--	4
15	SPV-1494	5	--	--	--	--	6	--	6

DM = Dagadi Solapur, GM = Gidda Maldandi

### Highlights of Research Progress: Centre-wise and year-wise

#### Review of the progress of Rabi 1999-2000:

**Adaptive Varietal Trials:** The performance of 4 cultivars SPV 1359, SPV 1155, CSH 15R along with M 35-1 were tested last year at different centres as presented below.

Table : Summary of results of Advance Varietal Trials

Centre	Total trial	Cultivars/Ranks			
		I	II	III	IV
Parbhani	105	SPV 1380	SPV 1359	CSH 15R	SPV 1155
Dhule	155	SPV 1359	M35-1	CSH 15R	--
Solapur	116	SPV 1359	SPV 1380	SPV 1155	CSH 15R
Bijapur	115	SPV 1359	CSH 15R	SPV 1380	M35-1
Dharwad	136	SPV 1380	CSH 15R	SPV 1359	M35-1
Zaheerabad	115	SPV 1359	SPV 1155	--	--

Mean grain yields ( $\text{kg ha}^{-1}$ ) of the variety SPV 1359 under rainfed in various trials conducted by NGOs ranged from  $960 \text{ kg ha}^{-1}$  in Bijapur area to  $3053 \text{ kg ha}^{-1}$  in Solapur. Mean grain yield of SPV 1380 ranged  $956 \text{ kg ha}^{-1}$  in Bijapur area to  $2726 \text{ kg ha}^{-1}$  in rain fed trials in Solapur area. In Parbhani, the varieties were evaluated both under rainfed and irrigated conditions. Under irrigation, the grain yield of SPV 1359 was 71.6% higher than rainfed and in SPV 1380; irrigated trials were only 37% higher than rainfed yields. The yield level at Bijapur was low but Zaheerabad in Hyderabad, AP was lowest and improved genotypes including M 35-1 have been reported low yielding than its local under the management advocated by that NGO without farmer's liberty to adapt, management desired by him.

**Initial Varietal Trials:** Seven Cultivars :The first three ranking genotypes are summarized as below.

Centre	Cultivars Rank		
	I	II	III
Solapur	SPV 655	SPV 1411	SPV 1463
Parbhani	SPV 1411	SPV 655	SPV 1463
Dharwad	BRJ 356	RSLG 262	SPV 1462
Bijapur	BRJ 356	RSLG 262	SPV 1462
Dhule	RSLG 262	BRJ 356	SPV 1411

The pattern of yield was similar. Yield at Solapur and Parbhani was higher than other NGOs but relatively, yield at Zaheerabad was very extremely low (115-400 kg ha<sup>-1</sup>). Comparatively, data of improved vs farmers local was available from Solapur. It indicated 3154 kg ha<sup>-1</sup> in SPV 655 vs 1280 kg/ha local; 2975 kg ha<sup>-1</sup> vs SPV 1411, 2750 kg ha<sup>-1</sup> in SPV 1463 vs 680 kg ha<sup>-1</sup> in local, 2064 kg/ha in BRJ 356 vs 1600 kg/ha in local, 2454 kg ha<sup>-1</sup> in RSLG 262 vs 1453 kg ha<sup>-1</sup> in local, 2490 kg ha<sup>-1</sup> in SPV 1413 vs 1192 kg ha<sup>-1</sup> in local and so on.

### **Review of the progress of *Rabi* 2000-2001:**

The results of the trials conducted under Farmers Participatory Varietal Selection Programme during *Rabi* 2000-2001 were presented by the concerned NGO's and discussed in detail. The reports on the farmer preferred varieties rank wise by different NGO's were as follows.

Dharwad : SPV-1359, SPV-1380, SPV-1155, SPV-1457 and SPV-1411  
Bijapur : SPV-1359, SPV-1380, SPV-1411, SPV-1155, SPV-655  
Parbhani : SPV-1411, SPV-1359 (under irrigation), SPV-655 AND SPV-1155  
Solapur : SPV-655, SPV-1457, SPV-1411, CSV-216R, SPV-1155, RSLG-262 and CRS-2 (Shallow Soil)  
Akkalkot : RSLG-262, SPV-1155, SPV-1411 and SPV-1502

### **Review of the progress of *Rabi* 2001-2002:**

The centres-wise progress during *rabi* 2001-2002 is presented below.

#### **Parbhani:**

Farmers Participatory varietal trials were conducted in three villages i.e., Wadgaon, Pokhani and Salapuri with the help of Jeevan Jyot Charitable Trust, KVK Parbhani. All the trials were sown from last week of October to 1<sup>st</sup> week of November 2001.

**Mother Trial :** The highest yielding varieties were SPV1411 (22.60 q ha<sup>-1</sup>) and SPV 1359 (22.50 q ha<sup>-1</sup>) followed by SPV 1457 (17.76 q ha<sup>-1</sup>) and SPV1155 (16.90 q ha<sup>-1</sup>) under irrigation and SPV 1359 (13.35 q ha<sup>-1</sup>), SPV 1155 (13.10 q ha<sup>-1</sup>), SPV 1411 (13.0 q ha<sup>-1</sup>) followed by CSV-14R and SPV-1359 under rainfed conditions. The varieties SPV-1411 and SPV-1359 exhibiting 61.4% and 60.7% increase over local in grain yield under irrigation. While under rainfed condition SPV-1457 and SPV-1359 registered 26.8% and 21.0% followed by SPV-1155 (18.8%). The fodder yield of SPV-1359 (62.3 q ha<sup>-1</sup>) and SPV-1411 (62.0 q ha<sup>-1</sup>) was highest in irrigated conditions and exhibited 76.4% and 75.5% superiority over local. Under rainfed conditions the % increase of fodder over local was 56.3%, 51% and 43.5% in SPV-1359, SPV-1411 and SPV-1155 respectively.

**Baby Trial I (Adaptive Varietal Trial):** With 22.0 q ha<sup>-1</sup> of grain and 63 q ha<sup>-1</sup> of fodder the two varieties SPV-1359 and SPV-1411 showed no difference in grain and fodder yield.

The variety SPV-1359 was irrigated in two villages i.e., Wadgaon and Salapuri while SPV-1411 was irrigated in all the villages. Rest of the entries was grown in rainfed conditions. SPV-655 (52.7 q ha<sup>-1</sup>), SPV-1155 (47.3 q ha<sup>-1</sup>) and SPV-1457 (46.7 q ha<sup>-1</sup>) exhibited 48.3%, 41.9% and 32.1% superiority in fodder over check under rainfed conditions. However the grain luster, bhakari and quality of SPV 1411 was superior over all genotypes.

**Baby Trial II (Initial Varietal Trial):** This SPV-1494 recorded highest grain and fodder yield (21.1 and 59.5 q ha<sup>-1</sup>) followed by RSV-351 (19.83 q and 57.33 q ha<sup>-1</sup>), SPV-1452 (18.53 q and 52.33 q ha<sup>-1</sup>). The variety SPV-1494 has shown highest % improvement (59.1% and 80.3%), both in grain and fodder yield over local followed by RSV-351 (34.3%) and SPV-1503 (32.2%) in grain and RSV-351 (59.2%) and SPV-1546 (48.9%) in fodder yield.

#### **Dharwad:**

**Mother Trial :** The two varieties SPV-1411 (13.3 q ha<sup>-1</sup>) and SPV 1457 (13.1 q ha<sup>-1</sup>) were high yielding exhibiting 12.8% and 11.1% superiority in grain yield over check. The variety SPV-1457 has high fodder yield (15.6 q ha<sup>-1</sup>) registering 59.8% increase over local.

**Baby Trial I (Adaptive Varietal Trail) :** The. SPV1457, CSV14R were found superior over their corresponding check varieties both in grain and fodder yields. With 18.74 q ha<sup>-1</sup> and 18.1 q ha<sup>-1</sup> of grain and 50.7 q ha<sup>-1</sup> and 46.9 q ha<sup>-1</sup> of fodder yield, both these varieties have exhibited 31.9% and 27.3 superiority in grain and 43.9% and 33.1% in fodder. SPV1155 and SPV1380 were superior in fodder and grain by 9% and 8%.

**Baby Trail II (Initial Varietal Trial):** All the improved varieties have not shown superiority over local check variety.

#### **Rahuri:**

**Mother Trial:** Among the genotypes SPV1359 recorded the highest yield both in grain (20.3 q ha<sup>-1</sup>) and fodder (50.9 q ha<sup>-1</sup>). SPV-1457 (16.9 q ha<sup>-1</sup>) and SPV1411 (16.4 q ha<sup>-1</sup>) were next in order.

**Baby Trial I (Adaptive Varietal Trial):** SPV1359 with 20.1 q ha<sup>-1</sup> grain yield and 57.7 q ha<sup>-1</sup> fodder yield was the highest yielding variety than rest of the genotypes and local variety.

**Baby Trail II (Initial Varietal Trial):** Among the genotypes tested in this trial, SPV1503 (25.0 q ha<sup>-1</sup>) and RSV351 (20.8 q ha<sup>-1</sup>) recorded high grain and fodder yield.

**Participatory Plant Breeding (PPB):**In this programme, the F4 bulks of SPV1359 x RSV33R; SPV1359 x RSV104; SPV1359 x Sel-3; SPV1359 x RSP-2; SPV1359 x (RSCR-3 x Sel-3); SPV504 x (IS1104 x SPV1359); RSLG262 x (SPV504 x IS1104); SPV655 x RSLG262; CSV14R x RSV104 were grown on farmers field with his own management at

village Padhavad. Among these above crosses, two bulks from each cross were made with the help of farmers.

### **Hyderabad:**

**Mother Trial:** SPV1359 was most extensively evaluated in 20 farmer-managed trials. The average yield of SPV 1359 was 7.31 q ac<sup>-1</sup> compared to 4.70 q ac<sup>-1</sup> of corresponding local. This variety exhibited 54% increase over local. The SPV-1155 and CSV-14R with 6.1q and 6.8 q ac<sup>-1</sup> registered 47% and 45% superiority over local. The variety SPV-1411 with 6.5-q ac<sup>-1</sup> grain yield was 36% superior. Another variety SPV1457 was low yielding as compared to local. As far as the fodder yields are concerned, the local variety cultivated by the farmer has better fodder than improved cultivar.

**Baby Trial I (Adaptive Varietal Trial):** Among the above mentioned five varieties the average yield of CSV-14R was high (7.0 q ac<sup>-1</sup>) exhibiting 30% increase over local. The average yield of SPV1359 and SPV1155 was 6.80 and 6.43 q ac<sup>-1</sup> exhibiting 49% and 46% superiority over local. The fodder yield of local was higher than all improved varieties.

**Baby Trial II (Initial Varietal Trial):** The results of baby trail II indicated that the local cultivar of the region was better in both grain and fodder respectively. The average grain and fodder yields of the improved cultivars SPV 1546 and SPV 1503 were 3.80 and 3.62 q ac<sup>-1</sup> respectively, which was less than the local cultivars whose grain yield ranged between 5.25q to 4.83 q ac<sup>-1</sup> respectively.

### **Solapur:**

**Mother Trail :** Based Most of the varieties were superior to their local checks in each village. The range in grain yield were from 8.3q to 15.9 q ha<sup>-1</sup> in Arali, 6.0q to 9.0 q ha<sup>-1</sup> in Darshanal, 8.6q to 15.8 q ha in Boregaon and 9.0 to 14.7 q ha<sup>-1</sup> in Pitapur. SPV1359 was extensively evaluated in 23 farmer-managed trials. The average yield of SPV1359 was 12.5 q ha<sup>-1</sup> compared to 7.4 q ha<sup>-1</sup> yield of corresponding local. This variety exhibited 69% superiority over the local. SPV 1457 with 12.2 q ha<sup>-1</sup> of grain yield was 65% superior. RSLG262 (11.8 q ha<sup>-1</sup>) and CSV14R (11.5 q ha<sup>-1</sup>) resgistered 58.8% and 55% increase over the local. SPV1411 and SPV1155 were 31% and 19% superior. The varieties SPV1359, RSLG262 and SPV1457 performed well across villages whereas the variety CSV14R in Borgeon and SPV1155 in Pitapur performed better.

**Baby Trial I (Adaptive Varietal Trial):.** The average grain yield of SPV1359 was 8.3 qha<sup>-1</sup> compared to 7.2 qha<sup>-1</sup> yield of corresponding local. This variety exhibited 15% increase over the local. The SPV1155 has 9.1 qha<sup>-1</sup> grain yield exhibiting 63% superiority. Another variety RSLG-262 has 9.1 q ha<sup>-1</sup> grain yields, and was 42% superior to local. Other varieties CSV14R, SPV-1411, SPV-1457 and CRS-2 were 40.5%, 31.3%, 27.8% and 25.7% superior to local cultivar. The fodder yield of SPV655, SPV1155 was high, exhibiting 52.6% and 44.0% superiority. Four varieties i.e. CSV-14R, SPV1457, RSLG262 and CRS-2 were also evaluated in irrigated condition. Among them CRS-2 with 11.3 q ha<sup>-1</sup> grain yield exhibited 50.6% improvement over local.



Baby Trial II (Initial Varietal Trial): SPV1546 was the best performing variety for grain yield. Its average grain yield was 10.4 q ha<sup>-1</sup> exhibiting 82% increase over its corresponding check. Other varieties, superior to corresponding check were Halejola, SPV1556, SPV1503 and SPV1555. These were superior by 32%, 26.9%, 22% and 19.7% respectively. In fodder yield SPV1546 was superior by 25% followed by RSV351 (18.0%), SPV1556 (15.8%) and SPV1555 (14.8%).

**Annexure-IV**

**RESPONSE OF FARMERS TO DIFFERENT CHARACTERS OF HYV VS LOCAL**

**Table: Response of farmers to different characters of HYV vs Local, Dhule centre, 1999-00 (AVT)**

Variety	No of trials	Plant height (%)			Threshability (%)			Grain size (%)				Grain colour (%)		Flour recovery (%)		
		More (1)	Same (2)	Low (3)	Good (1)	Similar (2)	Poor (3)	Small (1)	Medium (2)	Bold (3)	Very bold (4)	Acceptable (1)	Non-acceptable (2)	High (1)	Medium (2)	Low (3)
SPV 1359	37	100 (37)	0	0	0	100 (37)	0	0	100 (37)	0	0	100 (37)	0	0	100 (37)	0
CSH 15R	29	0	41 (12)	59 (17)	0	100 (26)	0	0	83 (24)	17 (5)		14 (4)	86 (25)	0	100 (29)	0
M35-1	21	0	100 (21)	0	0	100 (21)	0	0	100 (21)	0	0	100 (21)	0	0	100 (21)	0

Variety	No of trials	Roti Quality (%)			Keeping Quality (%)				Farmer acc- Men (%)				Farmer acc-Women (%)			
		Better (1)	Same (2)	Poor (3)	Good (1)	Fair (2)	Average (3)	Poor (4)	High (1)	Good (2)	Average (3)	Low (4)	High (1)	Good (2)	Average (3)	Low (4)
SPV 1359	37	0	100 (37)	0	4	89 (33)	0	0	100 (37)	0	0	0	100 (37)	0	0	0
CSH 15R	29	0	38 (11)	62 (18)	0	0	27 (8)	72 (21)	0	0	24 (7)	76 (22)	0	0	24 (7)	76 (22)
M35-1	21	9 (2)	90 (19)	0	0	100 (21)	0	0	0	100 (21)	0	0	0	100 (21)	0	0

Note: Figures in parenthesis indicates number of farmers responded

**Table: Response of farmers to different characters of HYV vs Local, Dhule centre, 1999-00 (IVT)**

Variety	No of trials	Plant height (%)			Threshability (%)			Grain size (%)				Grain colour (%)		Flour recovery (%)		
		More (1)	Same (2)	Low (3)	Good (1)	Similar (2)	Poor (3)	Small (1)	Medium (2)	Bold (3)	Very bold (4)	Acceptable (1)	Non-acceptable (2)	High (1)	Medium (2)	Low (3)
RSLG 262	4	0	100 (4)	0	0	100 (4)	0	0	100 (4)	0	0	100 (4)	0	0	100 (4)	0
SPV 1411	3	100 (3)	0	0	0	100 (3)	0	0	100 (3)	0	0	100 (3)	0	0	100 (3)	0
CSH 15R	5	0	0	100 (5)	0	100 (5)	0	0	100 (5)	0	0	100 (5)	0	0	100 (5)	0
BRJ 256	3	0	0	100 (3)	0	100 (3)	0	0	100 (3)	0	0	67 (2)	33 (1)	0	0	100 (3)
RSE 3	5	0	100 (5)	0	0	100 (5)	0	0	100 (5)	0	0	100 (5)	0	0	100 (5)	0

Variety	No of trials	Roti Quality (%)			Keeping Quality (%)				Farmer acc- Men (%)				Farmer acc-Women (%)			
		Better (1)	Same (2)	Poor (3)	Good (1)	Fair (2)	Average (3)	Poor (4)	High (1)	Good (2)	Average (3)	Low (4)	High (1)	Good (2)	Average (3)	Low (4)
RSLG 262	4	0	100 (4)	0	0	100 (4)	0	0	0	50 (2)	50 (2)	0	0	100 (4)	0	0
SPV 1411	3	0	0	100 (3)	0	0	100 (3)	0	0	0	67 (2)	33 (1)	0	0	67 (2)	33 (1)
CSH 15R	5	0	0	100 (5)	0	0	100 (5)	0	0	0	40 (2)	60 (3)	0	0	80 (4)	20 (1)
BRJ 256	3	0	0	100 (3)	0	0	100 (3)	0	0	0	33 (1)	67 (2)	0	0	33 (1)	67 (2)
RSE 3	5	0	0	100 (5)	0	0	100 (5)	0	0	0	80 (4)	20 (1)	0	0	80 (4)	20 (1)

Note: Figures in parenthesis indicates number of farmers responded

**Table: Response of farmers to different characters of HYV vs Local, Solapur centre, 1999-00 (IVT)**

Variety	No of trials	Plant height (%)			Threshability (%)			Grain size (%)				Grain colour (%)		Flour recovery (%)		
		More (1)	Same (2)	Low (3)	Good (1)	Similar (2)	Poor (3)	Small (1)	Medium (2)	Bold (3)	Very bold (4)	Acceptable (1)	Non-acceptable (2)	High (1)	Medium (2)	Low (3)
SPV655	15	13 (2)	87 (13)	0	0	80 (12)	20 (3)	0	47 (7)	53 (8)	0	100 (15)	0	-	-	-
SPV1411	15	33 (5)	67 (10)	0	7 (1)	93 (14)	0	0	33 (5)	67 (10)	0	100 (15)	0	-	-	-
RSLG262	3	-	-	-	0	100 (3)	0	66 (2)	33 (1)	0	0	100 (3)	0	-	-	-
SPV1413	5	-	-	-	0	40 (2)	60 (3)	40 (2)	60 (3)	0	0	100 (5)	0	-	-	-
BRJ356	3	-	-	-	0	66 (2)	33 (1)	33 (1)	66 (2)	0	0	100 (3)	0	-	-	-
SPV1462	5	40 (2)	60 (3)	0	0	60 (3)	40 (2)	20 (1)	80 (4)	0	0	100 (5)	0	-	-	-

Variety	No of trials	Roti Quality (%)			Keeping Quality (%)				Farmer acc- Men (%)				Farmer acc-Women (%)			
		Better (1)	Same (2)	Poor (3)	Good (1)	Fair (2)	Average (3)	Poor (4)	High (1)	Good (2)	Average (3)	Low (4)	High (1)	Good (2)	Average (3)	Low (4)
SPV655	15	60 (9)	40 (6)	0	40 (6)	60 (9)	0	0	0	67 (10)	33 (5)	0	0	67 (10)	33 (5)	0
SPV1411	15	60 (9)	40 (6)	0	13 (2)	80 (12)	7 (1)	0	0	73 (11)	27 (4)	0	0	73 (11)	27 (4)	0
RSLG262	3	0	100 (3)	0	0	33 (1)	67 (2)	0	0	67 (2)	33 (1)	0	0	67 (2)	33 (1)	0
SPV1413	5	0	40 (2)	60 (3)	0	40 (2)	60 (3)	0	0	0	80 (4)	20 (1)	0	0	80 (4)	20 (1)
BRJ356	3	0	67 (2)	33 (1)	0	0	100 (3)	0	0	67 (2)	100 (3)	0	0	67 (2)	33 (1)	0
SPV1462	5	0	40 (2)	60 (3)	0	40 (2)	60 (3)	0	0	40 (2)	60 (3)	0	0	40 (2)	60 (3)	0

Note: Figures in parenthesis indicates number of farmers responded

**Table: Response of farmers to different characters of HYV vs Local, Dharwad centre, 2000-01 (AVT)**

Variety	No of trials	Plant height (%)			Threshability (%)			Grain size (%)				Grain colour (%)		Flour recovery (%)		
		More (1)	Same (2)	Low (3)	Good (1)	Similar (2)	Poor (3)	Small (1)	Medium (2)	Bold (3)	Very bold (4)	Acceptable (1)	Non-acceptable (2)	High (1)	Medium (2)	Low (3)
SPV 1359	50	50 (25)	50 (25)	0	70. (35)	30 (15)	0	-	-	-	-	100 (50)	0	52 (26)	46 (23)	2 (1)
SPV 1155	22	0	27 (6)	73 (16)	23 (5)	64 (14)	13 (3)	-	-	-	-	100 (22)	0	0	82 (18)	18 (4)
SPV 1411	7	0	14 (1)	86 (6)	0	43 (3)	57 (4)	-	-	-	-	100 (7)	0	14 (1)	57 (4)	29 (2)
SPV 1380	18	22 (4)	67 (12)	11 (2)	61 (11)	39 (7)	0	-	-	-	-	100 (18)	0	28 (5)	72 (12)	1
RSLG 262	25	0	40 (10)	60 (15)	24 (6)	52 (13)	24 (6)	-	-	-	-	100 (25)	0	0	52 (13)	48 (12)

Variety	No of trials	Roti Quality (%)			Keeping Quality (%)				Farmer acc- Men (%)				Farmer acc-Women (%)			
		Better (1)	Same (2)	Poor (3)	Good (1)	Fair (2)	Average (3)	Poor (4)	High (1)	Good (2)	Average (3)	Low (4)	High (1)	Good (2)	Average (3)	Low (4)
SPV 1359	50	76 (38)	24 (12)	0	82 (41)	12 (6)	6 (3)	0	38 (19)	52 (26)	10 (5)	0	4 (2)	52 (26)	36 (18)	8 (4)
SPV 1155	22	9 (2)	64 (14)	27 (6)	4 (1)	64 (14)	9 (2)	23 (5)	14 (3)	41 (9)	23 (5)	23 (5)	0	4 (1)	29 (13)	36 (8)
SPV 1411	7	28 (2)	14 (1)	58 (4)	0	76 (6)	14 (1)	0	0	58 (4)	14 (1)	28 (2)	0	0	42 (3)	58 (4)
SPV 1380	18	39 (7)	28 (5)	33 (6)	50 (9)	44 (8)	6 (1)	0	28 (5)	44 (8)	28 (5)	0	0	39 (7)	39 (7)	22 (4)
RSLG 262	25	0	16 (4)	84 (21)	12 (3)	48 (12)	32 (8)	8 (2)	12 (3)	56 (14)	20 (5)	12 (3)	0	16 (4)	40 (10)	44 (11)

Note: Figures in parenthesis indicates number of farmers responded

**Table: Response of farmers to different characters of HYV vs Local, Dharwad centre, 2000-01 (IVT)**

Variety	No of trials	Plant height (%)			Threshability (%)			Grain size (%)				Grain colour (%)		Flour recovery (%)		
		More (1)	Same (2)	Low (3)	Good (1)	Similar (2)	Poor (3)	Small (1)	Medium (2)	Bold (3)	Very bold (4)	Acceptable (1)	Non-acceptable (2)	High (1)	Medium (2)	Low (3)
SPV 655	3	0	0	100 (3)	0	0	100 (3)	-	-	-	-	67 (2)	33 (1)	0	67 (2)	33 (1)
SPV 1457	4	0	0	100 (4)	0	50 (2)	50 (2)	-	-	-	-	100 (4)	0	25 (1)	50 (2)	25 (1)
SPV 1490	3	0	0	100 (3)	0	67 (2)	33 (1)	-	-	-	-	100 (3)	0	0	37 (2)	33 (1)

Variety	No of trials	Roti Quality (%)			Keeping Quality (%)				Farmer acc- Men (%)				Farmer acc-Women (%)			
		Better (1)	Same (2)	Poor (3)	Good (1)	Fair (2)	Average (3)	Poor (4)	High (1)	Good (2)	Average (3)	Low (4)	High (1)	Good (2)	Average (3)	Low (4)
SPV 655	3	0	0	100 (3)	33 (1)	33 (1)	0	33 (1)	0	67 (2)	0	33 (1)	-	-	-	-
SPV 1457	4	0	0	100 (4)	0	100 (4)	0	0	0	50 (2)	0	50 (2)	0	50 (2)	25 (1)	25 (1)
SPV 1490	3	0	33 (1)	67 (2)	0	100 (3)	0	0	0	33 (1)	0	67 (2)	0	33 (1)	0	67 (2)

Note: Figures in parenthesis indicates number of farmers responded

**Table: Response of farmers to different characters of HYV vs Local, Bijapur centre, 2000-01 (IVT)**

Variety	No of trials	Plant height (%)			Threshability (%)			Grain size (%)				Grain colour (%)		Flour recovery (%)		
		More (1)	Same (2)	Low (3)	Good (1)	Similar (2)	Poor (3)	Small (1)	Medium (2)	Bold (3)	Very bold (4)	Acceptable (1)	Non-acceptable (2)	High (1)	Medium (2)	Low (3)
SPV 1463	6	100 (6)	0	0	0	100 (6)	0	0	0	100 (6)	0	100 (6)	0	0	100 (6)	0
SPV 655	6	0	0	100 (6)	0	100 (6)	0	0	0	100 (6)	0	100 (6)	0	0	100 (6)	0
CSR 2	5	0	0	100 (5)	0	100 (5)	0	0	100 (5)	0	0	100 (5)	0	0	100 (5)	0
SPV 1457	3	0	100 (3)	0	0	100 (3)	0	100 (3)	0	0	0	100 (3)	0	0	100 (3)	0
SPV 1490	2	50 (1)	0	50 (1)	0	100 (2)	0	0	0	100 (2)	0	100 (2)	0	0	100 (2)	0

Variety	No of trials	Roti Quality (%)			Keeping Quality (%)				Farmer acc- Men (%)				Farmer acc-Women (%)			
		Better (1)	Same (2)	Poor (3)	Good (1)	Fair (2)	Average (3)	Poor (4)	High (1)	Good (2)	Average (3)	Low (4)	High (1)	Good (2)	Average (3)	Low (4)
SPV 1463	6	100 (6)	0	0	0	0	100 (6)	0	0	100 (6)	0	0	0	100 (6)	0	0
SPV 655	6	100 (6)	0	0	0	100 (6)	0	0	0	100 (6)	0	0	0	100 (6)	0	0
CSR 2	5	0	100 (5)	0	0	0	100 (5)	0	0	100 (5)	0	0	0	100 (5)	0	0
SPV 1457	3	0	100 (3)	0	0	100 (3)	0	0	0	100 (3)	0	0	0	100 (3)	0	0
SPV 1490	2	0	100 (2)	0	0	100 (2)	0	0	0	100 (2)	0	0	0	100 (2)	0	0

Note: Figures in parenthesis indicates number of farmers responded

**Table: Response (%) of farmers to different characters of HYV in comparison with local, Solapur centre, 2000-01 (IVT)**

Variety	No of trials	Plant height			Threshability			Grain size				Grain colour		Flour recovery		
		More (1)	Same (2)	Low (3)	Good (1)	Similar (2)	Poor (3)	Small (1)	Medium (2)	Bold (3)	Very bold (4)	Acceptable (1)	Non-acceptable (2)	High (1)	Medium (2)	Low (3)
SPV1502	5	40 (2)	60 (3)	60 (3)	0	100 (5)	0	0	80 (4)	20 (1)	0	100 (5)	0	-	-	-
SPV1457	5	0	100 (5)	0	0	100 (5)	0	0	60 (3)	40 (2)	0	100 (5)	0	-	-	-
SPV1463	3	0	100 (3)	0	0	100 (3)	0	33 (1)	67 (2)	0	0	100 (3)	0	-	-	-
SPV1492	4	0	100 (4)	0	0	100 (4)	0	50 (2)	50 (2)	0	0	100 (4)	0	-	-	-
SPV1490	4	0	100 (4)	0	0	100 (4)	0	50 (2)	50 (2)	0	0	100 (4)	0	-	-	-
RSV143	5	0	100 (5)	0	0	100 (5)	0	40 (2)	60 (3)	0	0	100 (5)	0	-	-	-
RSV170	6	33 (2)	67 (4)	0	17 (1)	83 (5)	0	33 (2)	67 (4)	0	0	100 (6)	0	-	-	-
CSR 2	5	0	100 (5)	0	0	100 (5)	0	0	100 (5)	0	0	100 (5)	0	-	-	-
MUGU TI	2	0	100 (2)	0	0	100 (2)	0	50 (1)	50 (1)	0	0	100 (2)	0	-	-	-
BRJ 356	2	0	100 (2)	0	0	100 (2)	0	0	100 (2)	0	0	100 (2)	0	-	-	-



Variety	No of trials	Roti Quality			Keeping Quality				Farmer acc- Men				Farmer acc-Women			
		Better (1)	Same (2)	Poor (3)	Good (1)	Fair (2)	Average (3)	Poor (4)	High (1)	Good (2)	Average (3)	Low (4)	High (1)	Good (2)	Average (3)	Low (4)
SPV150 2	5	0	100 (5)	0	0	100 (5)	0	0	0	40 (2)	60 (3)	0	0	40 (2)	60 (3)	0
SPV145 7	5	0	100 (5)	0	0	80 (4)	20 (1)	0	0	80 (4)	20 (1)	0	0	80 (4)	20 (1)	0
SPV146 3	3	0	67 (2)	33 (1)	0	33 (1)	67 (2)	0	0	0	67 (2)	33 (1)	0	0	67 (2)	33 (1)
SPV149 2	4	0	100 (4)	0	0	50 (2)	50 (2)	0	0	50 (2)	25 (1)	25 (1)	0	50 (2)	25 (1)	25 (1)
SPV149 0	4	0	75 (3)	25 (1)	0	75 (3)	25 (1)	0	0	0	25 (1)	0	0	0	100 (4)	0
RSV143	5	0	100 (5)	0	0	60 (3)	40 (2)	0	0	0	100 (5)	0	0	0	100 (5)	0
RSV170	6	0	67 (4)	33 (2)	0	83 (5)	17 (1)	0	0	33 (2)	50 (3)	17 (1)	0	33 (2)	50 (3)	17 (1)
CSR 2	5	0	100 (5)	0	0	100 (5)	0	0	0	80 (4)	20 (1)	0	0	80 (4)	20 (1)	0
MUGU TI	2	0	50 (1)	50 (1)	0	50 (1)	50 (1)	0	0	0	50 (1)	50 (1)	0	0	50 (1)	50 (1)
BRJ 356	2	0	100 (2)	0	0	100 (2)	0	0	0	0	50 (1)	50 (1)	0	0	50 (1)	50 (1)

Note: Figures in parenthesis indicates number of farmers responded

## Extension Activities organized:

Sl No	Extension Activity	No. of programs by Rahuri NGO	Participants In Dhule	No. of programs by Solapur NGO	Participants In Solapur
<b>Year; 1999</b>					
1.	Training programmes	02		3	
	a. Use of HYV of <i>rabi</i> sorghum		35		
	b. Improved crop production techniques for <i>rabi</i> sorghum under rainfed conditions		50		77
2.	Group meetings	02	66	4	69
3.	Farm walks		33		
<b>Year; 2000</b>					
1.	Training programmes	06		8	
	a. Use of HYV of <i>rabi</i> sorghum		120		93
	b. Improved crop production techniques for <i>rabi</i> sorghum under rainfed conditions		121		132
2.	Group meetings	06	220	5	156
3.	Farm walks	03	118	4	49
4.	Field Day	01	55	1	61
<b>Year; 2001</b>					
1.	Training programmes	02	3		
2.	a. Use of HYV of <i>rabi</i> sorghum		30		68
	b. Improved crop production techniques for <i>rabi</i> sorghum under rainfed conditions		25		45
3.	Group meetings	02	72	5	71
4.	Farm walks	01	22	7	96
5.	Field Day	01	37		
6.	Exposure visit of farmers to AICSIP, MPKV, Rahuri	01	10	2	19
7.	News paper coverage	06		2	

**Farmers reactions to the varieties tested under Farmer Managed Participatory Research (FAMPAR) Trials during *Rabi* 1999-2000 to 2001-2002**

Sl.	Varieties	Farmer's Reactions
1.	SPV-1380	<ul style="list-style-type: none"> <li>• Excellent for grain yield but poor for fodder purpose</li> <li>• Good quality of grains</li> <li>• Bird sitting avoided due to loose panicle</li> <li>• Difficult to harvest since roots go deep</li> <li>• Excellent for medium to heavy soil with irrigation facility</li> <li>• Bold grains with good seed weight</li> <li>• Leaves do not remain intact till harvest</li> <li>• Internodal distance is more, which is not preferable</li> </ul>
2.	SPV-1155	<ul style="list-style-type: none"> <li>• Good grain yield</li> <li>• Fodder preferred by animal</li> <li>• Fodder quality is similar to Maldandi</li> <li>• Flour recovery similar to local</li> </ul>
3.	SPV-1359 (CSV-216R)	<ul style="list-style-type: none"> <li>• Excellent for higher grain yield</li> <li>• Bold grain</li> <li>• Stem not stout, sturdy</li> <li>• No sweetness in stem</li> <li>• Fodder not preferred by cattle, due to poor fodder quality</li> <li>• Better flour recovery with good keeping quality</li> </ul>
4.	M35-1	<ul style="list-style-type: none"> <li>• Good for grain and Fodder yield</li> <li>• Leaves remain intact to stem till harvest</li> <li>• Fodder excellent for cattle</li> </ul>
5.	CSH-15R	<ul style="list-style-type: none"> <li>• Good for grain yield under irrigation</li> <li>• Earlier than local</li> <li>• Grain filling up to 60 to 70%</li> <li>• Fodder moderately preferred by cattle</li> </ul>
6.	RSLG-262	<ul style="list-style-type: none"> <li>• Moderate performance</li> <li>• Fodder preferred by cattle</li> <li>• Less aphid and sugary disease</li> <li>• Can withstand in dry spell</li> </ul>
7.	SPV-1462	<ul style="list-style-type: none"> <li>• Moderate grain and fodder yield</li> <li>• Less fodder yield due to dwarfness</li> <li>• Fodder preferred by cattle</li> </ul>
8.	BRJ-356	<ul style="list-style-type: none"> <li>• Good for grain and fodder yield</li> <li>• Good for fodder yield</li> </ul>

		<ul style="list-style-type: none"> <li>• Fodder preferred by cattle</li> <li>• Leaves remain intact with stem</li> </ul>
<b>9.</b>	<b>SPV-1413</b>	<ul style="list-style-type: none"> <li>• Earlier than Dagadi</li> <li>• Bold grain</li> <li>• Good earhead</li> <li>• Good for grain and fodder yield</li> </ul>
<b>10</b>	<b>SPV-655</b>	<ul style="list-style-type: none"> <li>• Best for grain and fodder yield and its grain color</li> <li>• Better than local</li> <li>• Fodder preferred by cattle</li> <li>• More bird damage</li> </ul>
<b>11</b>	<b>SPV-1463</b>	<ul style="list-style-type: none"> <li>• Good for fodder and grain purpose</li> <li>• Fodder preferred by cattle</li> </ul>
<b>12</b>	<b>SPV-1411</b>	<ul style="list-style-type: none"> <li>• Very bold grain with attractive grain luster and colour</li> <li>• Moderate, good for grain yield</li> <li>• Fodder preferred by cattle due to good fodder quality</li> <li>• Good threshability, better flour recovery</li> <li>• Good roti quality with better keeping quality</li> </ul>
<b>13</b>	<b>SPV-1457</b>	<ul style="list-style-type: none"> <li>• Medium grain size, colour acceptable</li> <li>• Moderate fodder quality</li> <li>• Good threshability and roti keeping quality</li> </ul>
<b>14</b>	<b>RSV-351</b>	<ul style="list-style-type: none"> <li>• Good grain yield.</li> <li>• Good threshability, grain colour acceptable</li> <li>• Fodder preferred by cattle</li> </ul>
<b>15</b>	<b>SPV-1503</b>	<ul style="list-style-type: none"> <li>• Good for grain and fodder yield</li> <li>• Fodder preferred by cattle</li> <li>• More bird damage</li> </ul>
<b>16</b>	<b>SPV-1546</b>	<ul style="list-style-type: none"> <li>• Best for grain yield</li> <li>• Grain colour acceptable</li> <li>• Better roti quality</li> </ul>
<b>17</b>	<b>SPV-1550</b>	<ul style="list-style-type: none"> <li>• Excellent for higher grain yield</li> <li>• Bold and good quality of grains and fodder</li> <li>• Grain colour acceptable</li> <li>• Better flour recovery and roti quality</li> </ul>
<b>18</b>	<b>SPV-1555</b>	<ul style="list-style-type: none"> <li>• Moderate grain yield</li> <li>• Grain colour acceptable</li> <li>• Fodder quality medium</li> <li>• Fair roti keeping quality</li> </ul>
<b>19</b>	<b>Dagadi Solapur</b>	<ul style="list-style-type: none"> <li>• Good threshability</li> <li>• Grain colour acceptable</li> <li>• Better flour recovery</li> <li>• Medium fodder quality</li> </ul>
<b>20</b>	<b>Gidda Maldandi</b>	<ul style="list-style-type: none"> <li>• No lodging problem due to dwarfness</li> <li>• Good threshability</li> </ul>

		<ul style="list-style-type: none"> <li>• Fodder preferred by animal</li> <li>• Less fodder yield due to dwarfness</li> </ul>
<b>21.</b>	<b>SPV-1452</b>	<ul style="list-style-type: none"> <li>• Grain colour acceptable</li> <li>• Good for grain and fodder yield</li> <li>• Better flour recovery and roti quality</li> <li>• Fodder preferred by cattle</li> </ul>
<b>22</b>	<b>SPV-1494</b>	<ul style="list-style-type: none"> <li>• Excellent for grain and fodder yield</li> <li>• Bold grain</li> <li>• Good fodder quality</li> <li>• Fair roti keeping quality</li> <li>• Fair roti quality</li> </ul>
<b>23. Segregating Materials(F2)</b>		<ul style="list-style-type: none"> <li>• Farmer expressed his desire to test improved variety rather than non-uniform populations.</li> </ul>

### High lights of the Field days conducted in Solapur District

**Venue:** Village Temple Premises, Tandulwadi

**Date:** February 9, 2001

**Varieties tested:** SPV-1155, SPV-1411, SPV-655, CSV-216R, SPV-1457, SPV-1492,  
Near field day site: SPV-1380, M35-1, Local

**Officials present:** Dr. M.S.Raut, Dr. Prabhakar, Sh. N.W. Sawarkar, Sh. H.B.,  
Kumbhalkar, Shri Pramod Kumar of CRS (NRCS), Solapur and Shri  
Kalyanshetti (NGO)

No. of Farmers participated: 75 farmers

- Trials were shown to all participant farmers in groups.
- Farmers reaction was good for SPV-1411 whereas, they didn't like SPV-1380 due to it's loose earhead
- Farmers also preferred CSV-216R, SPV-655 and SPV-1457.

After field visit, Sh. Kalyanshetti, NGO, gave introduction on Farmers Participatory Varietal Selection, it's objectives and success till the date. He shared his past experience on the programme taken at Musti village in *Rabi* 1999-2000. He emphasized the prime role of farmers in this programme and urged the farmers for extending co-operation by giving necessary information, suggestions and their reaction about the trials to make this programme more successful.

Dr. MS .Raut, Sr. Agronomist explained in detail on *rabi* sorghum technology like selection of variety based on soil type, irrigation facility, plant protection measures and plant population. He suggested to farmers that for getting higher yield, farmers will have to compromise with fodder quality. Dr. Prabhakar, Sr. Breeder gave salient features of various being tested in the programme and stressed on the selection of varieties for different conditions. He requested the farmers to see one another's trials, interact among themselves and tell their problems and opinions on new varieties.

In group discussions following issues were raised by the farmers.

- Surety of seed supply of selected entries from reliable sources at proper time
- The varieties should not lodge
- Entries given to farmers should have good fodder and grain quality

**Venue:** Panchayat Office, Sultanpur

**Date:** February 27, 2001

**Officials present:** Dr. K.D.Patil, Dr.M.S.Raut, Dr. Prabhakar, Sh. N.W. Sawarkar, of  
CRS (NRCS), Solapur and Shri Paremshwar Bavkar (NGO)

No of Farmers participated: 80 farmers

- Trials were shown to all participant farmers in groups
- Farmers reaction was good preference for SPV-1502, SPV-1411 and RSLG-262 whereas, they did not prefer SPV-1380 due to it's loose ear head

Shri. N.W. Sawarkar gave introduction on Farmers Participatory Varietal Selection, its objectives and implementation of the programme.

Dr. Raut explained about the *rabi* sorghum production technology and gave tips for increasing the production. Especially he emphasized on spacing, optimum plant population, plant protection practices and irrigation management. Dr. Prabhakar highlighted salient features of ten different varieties under the project and asked farmers to give their remarks and experiences. He also requested the farmers to see one another's trials and interact among themselves.

Gramesvak of the Sultanpur village provided information that the area under *Rabi* Sorghum is 500 acres out of which only 100 acres are under rain fed situation.

In the group discussion, the following issues were raised by the farmers

- Farmers generally prefer the late sowing of *rabi* sorghum (in Hast Nakshatra ,i.e end of October to first week of November) to minimize disease incidence and prevent lodging of the crop
- Farmers preferred entries in the following sequence SPV-1502, CSV-216R, SPV-1411, SPV-1155
- Farmers asked about the risk of entries like SPV-1380 which showed twisting of leaves before flowering during the season.
- Farmers told that though entries show good performance by appearance in the standing field, they would give their opinions after comparing grain yield, fodder and grain quality of improved varieties with their local.
- Some of the farmers added that fodder quality is not that much important than grain yield in their village.

## शेतकरी मेळावा व पीक परिसंवादाचे पढावद येथे २७ रोजी आयोजन

धुळे - पढावद (ता. शिंदखेडा) येथील विवेकानंद हायस्कूल प्रांगणात शेतकरी मेळावा आणि पीक परिसंवाद २७ जानेवारी रोजी सकाळी ८.०० वाजता फुले कृषि विद्यापीठ राहुरी अंतर्गत कृषि विज्ञान केंद्र धुळे आणि पढावद येथील खान्देश कृषि विचार मंच यांच्या संयुक्त विद्यमाने आयोजित करण्यात आलेला आहे.

या शेतकरी मेळावा आणि पीक परिसंवादाचे आणि कृषि प्रदर्शनाचे उद्घाटन महाराष्ट्र राज्याचे कृषि, पशुसंवर्धन व संसदीय कार्यमंत्री रोहिदास पाटील यांच्या हस्ते होईल.

कार्यक्रमाच्या अध्यक्षस्थानी अहमदनगर जिल्ह्यातील राहुरी फुले कृषि विद्यापीठाचे कुलगुरू डॉ. सुभाष पुरी हे राहतील. तर प्रमुख पाहुणे म्हणून धुळे जिल्हा परिषदेचे अध्यक्ष सी. संगीता देसले, उपाध्यक्ष सुभाष देवरे आणि कृषि विद्यापीठाचे विस्तार शिक्षण विभागाचे संचालक डॉ. गजानन सावंत हे राहणार आहेत.

या मेळाव्यानिमित्त शेतकरीवांधव शेतावरील पीक प्रात्यक्षिकास भेट देतील. मेळाव्यात डॉ. माधवराव शिंदे गहू, डॉ. जमदग्नी, डॉ. के. बी. वंजारी, हरभरा, डॉ. भास्करराव नारखेडे, डॉ. बी. एस. राणा रब्बी ज्वारी, प्रा. सुदामसिंग राजपूत, एकात्मिक किड नियंत्रण, धुळे कृषि महाविद्यालयाचे सहयोगी अधिष्ठाता तथा प्राचार्य डॉ. तुकाराम मोरे भाजीपाला तंत्रज्ञान, राहुरी कृषि विद्यापीठाचे संचालक संशोधन डॉ. राजाराम देशमुख, विद्यापीठाची संशोधनाची वाटचाल या विषयावर शेतकऱ्यांना तांत्रिक मार्गदर्शन करणार

आहेत. त्याचप्रमाणे पढावद येथील शेतकरी अॅड. प्रकाश पाटील, शिरपूर तालुक्यातील बुडकीचे प्रभू पावरा हे शेतकरी आपले शोताविषयक कुर्यापधती संबंधी मनोगत व्यक्त करणार आहेत. तेंव्हा शेतकऱ्यांना मोठेच संख्येने या कार्यक्रमास उपस्थित रहावे असे आवाहन कृषि विज्ञान केंद्र धुळे प्रशिक्षण संयोजक डॉ. पांडुरंग मकर, पढावद येथील खान्देश कृषि विचार मंचाचे प्रवर्तक अॅड. प्रकाश भुता पाटील, शरद विक्रम पाटील, नानासाहब उत्तमराव पाटील यांना केले आहे.

### लोकमत ■ ४

मंगळवार, दि. २२ जानेवारी २००२

### पढावद येथे पीक परिसंवाद व शेतकरी मेळाव्याचे आयोजन

धुळे, दि. २१ (श.प्र.) - महात्मा फुले कृषि विद्यापीठांतर्गत कृषि विज्ञान केंद्र धुळे व खान्देश कृषि विचार मंच पढावद ता. शिंदखेडा यांच्या संयुक्त विद्यमाने रविवार दि. २७ जानेवारी रोजी सकाळी ८ वाजता पढावद येथे शेतकरी मेळावा व पीक परिसंवादाचे आयोजन करण्यात आले आहे. विवेकानंद हायस्कूल येथे आयोजित या कार्यक्रमाचे उद्घाटन कृषीमंत्री ना. रोहिदास पाटील यांच्या हस्ते होणार असून प्रमुख पाहुणे म्हणून जि.प.अध्यक्ष सी. संगीता देसले, उपाध्यक्ष सुभाष देवरे, तर अध्यक्षस्थानी म. फुले कृषि विद्यापीठाचे कुलगुरू डॉ. सुभाष पुरी उपस्थित राहणार आहेत. उपस्थितीचे आवाहन प्रशिक्षण संयोजक डॉ. पांडुरंग मकर व खान्देश कृषि विचारमंच पढावदतर्फे करण्यात आले आहे.



/ सकाळ : बुधवार, २३ जानेवारी २००२

## पढावद येथे रविवारी शेतकरी मेळावा, परिसंवाद

धुळे, ता. २२ : महात्मा फुले कृषि विद्यापीठाचे कृषि विज्ञान केंद्र व खानदेश कृषि विचारमंच यांच्यातर्फे पढावद (ता. शिंदखेडा) येथे २७ जानेवारीला पीक परिसंवाद व शेतकरी मेळावा घेण्यात येणार आहे. विवेकानंद हायस्कूलमध्ये होणाऱ्या या मेळाव्याचे उद्घाटन कृषिमंत्री रोहिदास पाटील यांच्या हस्ते होईल.

कार्यक्रमाच्या अध्यक्षस्थानी महात्मा फुले कृषि विद्यापीठाचे कुलपुरू डॉ. सुभाष पुरी, तर जिल्हा परिषदेच्या अध्यक्षा सौ. संगीता देसले व उपाध्यक्ष सुभाष देवरे, कृषि महाविद्यालयाचे सहयोगी अधिष्ठाता डॉ. तुकाराम मोरे, विस्तार शिक्षण संचालक डॉ. गजानन सावंत, संशोधन संचालक डॉ. राजाराम देशमुख प्रमुख पाहुणे असतील.

कार्यक्रम असे : २७ जानेवारीला सकाळी आठ ते साडेआठ शेतकऱ्यांची नावनोंदणी, माडेआठला शेतावरील पीक प्रात्यक्षिकास भेट, साडेनऊला कृषि प्रदर्शनाचे उद्घाटन, पावणेदहाला दीपप्रज्वलन व कृषि मेळाव्याचे उद्घाटन, नंतर स्वागत, दहाला प्रास्ताविक, सन्वादहाला तांत्रिक मार्गदर्शन यात गृह मंत्रालयाचे डॉ. यादवराव शिंदे, तर रब्बी शेतावरील पीक प्रात्यक्षिकास भेट देण्यात डॉ. भास्करराव नागळे व डॉ. बी. एस. राणा मार्गदर्शन करतील. एकात्मिक कीड नियंत्रण या विषयावर प्रा. सुदामसिंग राजपूत आणि हरभरा या विषयावर डॉ. बी.

एम. जमदग्नी व डॉ. के. बी. वंजारी मार्गदर्शन करतील. भाजीपाला तंत्रज्ञान या विषयावर डॉ. तुकाराम मोरे मार्गदर्शन करतील.

महात्मा फुले कृषि विद्यापीठाच्या संशोधनाची वाटचाल या विषयावर डॉ. राजाराम देशमुख मार्गदर्शन करतील. दुपारी शेतावरील पीक प्रात्यक्षिकास भेट देण्यात येईल.

## Market Survey:

## Dhule, Maharashtra

Phase - I			
1.	Geographic extent of the whole sale market for <i>rabi</i> sorghum in a season	50 to 60 km	
2.	Various outlets for sales for <i>rabi</i> sorghum	Sale as grain	
3.	Traits that determine the prices of <i>rabi</i> sorghum grains	i. Grain size ii. Grain colour/luster iii. Type of cultivar (Straight variety/hybrid) iv. Moisture in grains	
Phase - II			
1.	The traits of the new varieties acceptable to the market	i. In some cases, the grain size ii. Grain colour/luster iii. Straight type of varieties	
2.	Prices paid for the new varieties	Year	Market rates (Rs/q)
			New      Local
		1998-99	650-800    800-900
		1999-2k	650-750    800-900
	2000-01	550-600    600-625	
3.	Are the market prices seasonally variable?	Yes	

## Solapur

## Phase I

- 1) The wholesale market for *rabi* sorghum is Solapur
- 2) The Outlets for *rabi* sorghum are sale as grain & fodder

The major varieties & prices of *rabi* sorghum are as follows: -  
(Rates on 7/8/2000 at APMC, Solapur)

Sl. No.	Variety	Rate Rs./Q.
1.	M35-1 (Local)	575 to 600
2.	Dagdi	475 to 500
3.	Hy No.9	400 to 450
4.	Joot	675 to 725

## Phase II

### Price likely to be paid for the new varieties

Sl. No.	Variety	Rate Rs./Q.
1.	SPV-1359	480 to 520
2.	SPV-655	500 to 520
3.	BRJ-353	457 to 500
4.	RSLG-262	457 to 500
5.	SPV-1380	465 to 485
6.	SPV-1463	450 to 475
<b>Local varieties</b>		
1.	Joot	650 to 675
2.	M35-1	500 to 550
3.	Dagdi	475 to 500
4.	No-51	450 to 500
5.	Hy. No-9	400 to 450

### Rate variation From Jan. 2000 to August 2000

(Highest rates during the month for M35-1 in Rs./Q.)

Month	Rate Rs./Q
Jan. 2000	1100
Feb. & Mar. 2000	950
April & May 2000	750
June 2000	675
July 2000	625
August 2000	550

### Economics of cultivation of *Rabi* sorghum per hectare

(As per farmers practice, Source: Rahuri Centre)

Sl.No	Item	Quantity	Rate (Rs.)	Total Cost (Rs.)
1.	Labours	42	40/-	1680/-
2.	Bullock labours	06	50/-	300/-
3.	Power tractor	1 ha	1000/-	1000/-
4.	Seed (Kg/ha)	15	12/-	180/-
5.	Manures & fertilizers	--	--	--
6.	Plant protection	--	--	--
7.	Irrigation	--	--	--
8.	Land rent	1 ha	200/-	200/-
			<b>Total</b>	<b>3360/-</b>

## Annexure-IX

### Monitoring report of FAMPAR trials conducted during *Rabi* 2000-2001

The trials of DFID funded Farmers Participatory Varietal Selection Programme in *rabi* sorghum during *rabi* 2000-2001 at Dharwad, Bijapur, Solapur and Akkalkot were monitored. The team consisted.

1. Dr. M.S.Patil, Senior Sorghum Breeder, Bijapur, Team leader
2. Dr. Prabhakar, Senior Scientist, CRS, Solapur, Member

The schedule of visits was as follows.

Centre	Date of visit
Dharwad	February 26, 2001
Bijapur	March 1, 2001
Solapur	March 1, 2001
Akkalkot	March 1, 2001

The team during its visits critically evaluated the trials conducted through various NGO's at different locations and the following observations were made.

At Solapur, the PVS trials were conducted at Tandulwadi village, Solapur district through NGO, Shri Siddeshwar Krishi Vignan Prasarak Sanstha. A total of 213 trials (168 trials of AVT + 45 TRIALS OF IVT) have been conducted. The trials were laid out as per the plan along with locals. The representative plots of varieties under Adaptive trials like SPV-1380, CSV-216R, SPV-1155, RSLG-262, SPV-655, and SPV-1411 and of Initial varietal trials like CRS-2, SPV-1502, SPV-1492, and RSV-170 were observed and the varieties appeared to be better than the respective locals. The response of the farmers was good.

At Akkalkot, the FPVS trials were conducted in three villages namely Sultanpur, Chungi and Kini through NGO, Maharshi Vivekanand Samaj Kalyan Sanstha, Akkalkot. A total of 174 trials (150 trials of AVT +24 trials of IVT) were conducted. The trials were laid out as per the plan along with locals. The representative plots of varieties of Adaptive Varietal Trials namely CSV-216R, SPV-1380, SPV-1155, RSLG-262 and SPV-1411 and of Initial Varietal Trial namely SPV-1502, SPV-1457, SPV-1463 and SPV-1492 were seen. The crop condition was good and farmers responded to the programme favorably.

In Bijapur center, the FPVS trials were conducted in three villages namely Honaganahalli, Savanhalli and Thonsyal. A total of 180 trials were conducted. The trials were laid out as per the plan along with locals and the varieties appeared to be better than the respective locals. Among the varieties the, SPV-1380, CSV-216 and SPV-1155 were found promising for grain quality and non-lodging. SPV-1155 was early to flower. BRJ-356, RSLG-262 performed well under shallow soils. The problem of exertion in SPV-1491 (Thonsyal village) was slightly high. In RSV-256, SPV-1502, RSV-257 the germination percentage was poor. The overall crop condition in the farmers field was good, and farmers responded to the programme favorably.

In Dharwad center following results were obtained:

Evaluation of local land races (LGY): Sixteen genotypes including M35-1 were evaluated. Due to sudden withdrawal or *rabi* rains soon after sowing, plant stand in general was low in all the entries. However, among the entries tested, Tandur local rewarded highest grain yield of 2407 kg/ha followed by Gidda Maldandi (2315 kg/ha), whereas, M35-1 rewarded grain yield of 1509 kg/ha.

Evaluation of elite varieties / hybrids in farmer's field: Twelve varieties including CSH-15R were tested in 207 farmer's field comprising of 3 villages, viz., Somapur (74), Marewad (71) and Arahatti (62). Based on the overall performance the varieties SPV-1155, SPV-1359 and SPV-1380 were found to perform better than local check M35-1 and these three varieties were accepted by farmers based on their grain and fodder quality.

**Proceedings of Planning Workshop held at Centre for Arid Zone Studies, University of Wales, United Kingdom from 22<sup>nd</sup> to 30<sup>th</sup> August 1999**

A project planning workshop was organized at Centre for Arid Zone Studies (CAZS), University of Wales, Bangor, U.K. from 22<sup>nd</sup> to 30<sup>th</sup> August, 1999 for finalizing the details of activities and approaches of participatory varietal selection and to enable Indian Scientists to efficiently implement the Indo-British Collaborative Project on “Participatory Varietal Selection in *rabi* sorghum” funded by; the DFID Plant Sciences Research Programme. This project has been implemented at seven centres under the leadership of Dr.B.S.Rana, Director, NRC for Sorghum, Hyderabad for a period of three years from July 1, 1999. The scientific / technical deliberations of the workshop are as follows.

**On 23-8-1999**

**Visit to typical English Farm:** On the way, visit to a typical English Newspring Farm in Cambridgeshire was arranged at 08.30 hrs. The cropping pattern is on an average 75-80 acres of Oilseeds rape and 254-259 acres of winter wheat. They explained in detail on the seed procurement, soil husbandry, input required for the crops and output by way of yield and gross margin. The crops are insured for fire and hailstorm. The farmer’s income is taxable in U.K. Besides, the farmers in U.K. are also affected by fluctuation in price, untimely rains, drought etc.

**Visit to Henry Doubleday Research Association, Organic Gardens, Coventry:** On the way, we visited HRDA, Ryton organic Gardens from 1400 to 1600 hrs and Dr. Felicity Childs explained in detail about the activities of HRDA in Scientific research extension and training for developing countries. It is the largest organic organization in Europe, researching, providing information on and promoting organic gardening, farming and food.

The conservation of genetic resources is an important part of the Association’s work; hundreds of vegetable varieties are preserved for prosperity in the Heritage Seed Library, based at Ryton Orgainc Gardens. The Ryton demonstration gardens, are open to the public, and attract tens of thousands of visitors annually. These have been so successful that HRDA hs created new display gardens at Yalding, near Maidstone in Kent. HRDA also carries out scientific research in areas such as field vegetable production, pest, disease and weed control, recycling organic waste and soil nutrient dynamics.

## **ON 24-8-1999**

The actual AICSIP/CAZS planning workshop for Participatory Varietal Selection in *Rabi* Sorghum started at 1000 hrs with welcome by Dr.J.R.Witcombe and introduction of participants. Presentations were made by AICSIP and collaborators. Dr. B.S.Dhillon, ADG (FFC), ICAR gave a brief account on the genesis of the project and role played by ICAR. Later, Dr.B.S.Rana, Director, NRCS and National Leader of the project explained in detail about the Farmers Participatory Varietal Selection for improving *Rabi* Sorghum productivity in India. Dr.S.L.Kaul, Co-Principal Investigator explained technical aspects followed to design the participatory varietal selection in *rabi* sorghum. Later, the Collaborators explained their experiences in conducting the Participatory Varietal Selection programme voluntarily during *Rabi* 1998 at their centres. The presentations were preceded by a lecture on Participatory Varietal Selection by Dr. J.R.Witcombe. He explained as to how farmers participatory approaches for identification or breeding of improved crop cultivars can be usefully categorized into Participatory Varietal Selection (PVS) and participatory plant breeding. PVS is a more rapid and cost effective way of identifying farmer preferred cultivars if a suitable choice of cultivars exists. If this is difficult to achieve, then the more resource-consuming PPB is required. The long-term effect of PVS is to increase biodiversity, identifying adapted varieties speedy diffusion through in situ seed multiplication system. PPB has a greater effect on increasing biodiversity although its impact may be limited to smaller areas. PVS is a modification of the multilocational trials system through farmer management to:

- Allocate more resources for testing a greater number of elite lines
- Allow many traits to be evaluated by farmer himself
- Allow varieties to be tested under realistic management of farmer
- Allow varieties to be tested in a wide range of agronomic niches
- Promote the speed with which new varieties are adopted

## **From 25-8-1999 to 27-8-1999**

There were three lectures by Dr.B.S.Virk, Dr.D.Harris and Dr.J.R.Witcombe, respectively in the forenoon session.

Dr. Virk gave a detailed account of the success of PVS in high potential production system in India by taking an example of PVS system in Lunawada district in Gujarat. PVS has been used there with great success in marginal agricultural environments. It showed the large difference between favorable environments of the multilocational trials of the system and the actual conditions of the farmers.

Dr.Harris described the beneficial effects of on farm seed priming both for rain fed and *rabi* crops grown in pocket area of KRIBHCO Indo-British Project in India. The participatory approach used by KRIBHCO project has been highly successful in empowering farmers to test, develop and adapt seed priming and to appreciate its

effects. The results of over a thousand on farm trials using paired plots for maize, rice, chickpea and wheat showed that seed priming is a good insurance to farmers.

Dr. Witcombe, highlighted the aspects related to choice of parents, number of crosses and population size for participatory and classical plant breeding. Published theory on the optimum number of crosses in a plant breeding programme usually assumes that the value of all crosses is equal and hence over-estimates the number of crosses required in a breeding programme. When the optimum size of a population in a favorable cross is considered theory predicts that huge populations are required. If linkage between traits is also considered this population size is even larger. Hence, in a inbreeding crop, one possible strategy is to select a small number of crosses that are considered favorable and produce large populations from them to increase the probability of recovering superior genotypes. This strategy is ideally suited to the particular constraints and advantages of participatory plant breeding (PPB). Such an approach although not essential in classical breeding (CB) may still be advantageous. When a breeding programme is based on few crosses, the choice of parents is critical and farmer participatory methods are highly effective in narrowing the choice. In the participatory plant breeding of self pollinated crops using a low-cross-number approach modified bulk population breeding methods and recurrent selection are desirable strategies.