

## 10. MONITORING TEAM REPORT: KHARIF-2008

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### Summary

#### **Introduction**

The monitoring of Kharif AICSIP trials at different centers have been carried out during August to October 2008. Total thirteen AICSIP including volunteer centers (Coimbatore, Bhavanisagar, Palem, Indore, Surat, Deesa, Udaipur, Mauranipur, Jhansi, Kanpur, Pantnagar, Hisar and Ludhiana) have been monitored sorghum trials for their performances against biotic and abiotic stresses, agronomic and yield parameters. Twelve scientists from NRCS and six scientists from AICSIP centers were contributed for successful monitoring.

#### **Main observations**

##### **1. Coimbatore**

1. Coimbatore and adjoining areas received around 60% than the normal rainfall during June to September this year, resulting in fewer incidences of foliar diseases (downy mildew, rust and leaf blight, heavy infestation of mite in some plots and stem borer.
2. Very good segregation was noticed in the cross nos. 08B GM 03 and 08R Agr 16 under national crossing block.
3. RM population did not show any variation for tillering, plant height and seed colour.
4. In Agronomy, maximization of yield experiment was impressive

##### **2. Bhavanisagar**

1. The yield trials were affected due to heterogeneity in the field and non-uniform plant stand.
2. Due to water stagnation in parts of the field, crop growth was not satisfactory due to low line area and stagnation of water.
3. The plot size for genotypes was not uniform in a trial. The expression of some genotypes was impressive.

### **3. Palem**

1. Visual differences were not seen between 100% and 150% RDF.
2. All entries heavily infected with Anthracnose in public-private sector trials.
3. Five to seven entries in AVHT, IHT and IVT trials showed good performance for yield.
4. Susceptible local check PSV2 was not sown in pathology trials
5. In SPV lines there was poor germination in entomology trial
6. Application of fish meal was delayed, hence very low incidence of shoot fly was noticed..

### **4. Indore**

1. Even distribution of rainfall, hence the crop was good.
2. Material grown for registrations (GGUB 7, 52 and 50) was in good condition.
3. F<sub>2</sub> population was grown for shoot fly resistance and noticed some low dead hearts plants.
4. In almost all the breeding trials, stem borer infestation was high.
5. In the colored grain hybrids trial, the entry HN 5 was a tall, red seeded and promising.
6. In the F<sub>2</sub>'s under National Crossing Block, the crosses 08R Agro 15, Agro 19, 08B SF 06 and 08B SF 13 threw desirable segregates.
7. SPV 1779 and SPSSV 6 performed better in grain and sweet sorghum trial.
8. The shoot fly dead hearts % was ranged from 15-90 in AVHT, IVT, IHT, SFN trials.
9. Seed treatment with cruiser (Thiamethoxam) 70 Ws@ 3g/1 kg of seed was effective in controlling shoot fly (20% deadhearts).
10. The local check needs to be incorporated while comparing the improved hybrids/verities against different doses of fertilizers.

### **5. Surat**

1. Rainfall was 1065mm up to August, water logging affected general condition of crop.
2. In all the trials foliar diseases (Anthracnose & zonate leaf spot) appeared in traces.
3. Checks IS14332, IS14338, Bulk Y had poor stand in AVHT & IHT
4. IS14332 in AVT forage had more shoot fly damage.
5. In general stem borer damage was less than shoot fly in entomology trials.
6. In IHT- entry 903 heavy damage due to mites and also stem borer, 904 & 908 had moderate anthracnose. DJ6514 found tolerant/resistant to stem borer but susceptible to shoot fly.

### **6. Deesa**

1. The damage due to white grub and water logging was extensive.
1. *Anthracnose* a common disease appeared in all over but in traces.
2. Local check GJ 39 was highly susceptible to foliar diseases (anthracnose, zonate leaf spot).
3. AVHT grain, entries 902, 915, 950, 970 were relatively performed better. Other entry 916, 930 had heavy foliar diseases.
4. Agronomic trial for dual purpose had poor plant population and had white grub infestation.

### **7. Pantnagar**

1. During June-Sept. about 2000 mm rainfall was received which was 120 % more over the normal (900 mm). Hence, sowing of some trials were delayed and resulted in lodging, foliar disease in most of the trials.
2. Regeneration was poor in multi-cut trials owing to rotting due to excess rainfall..
3. Of the 9 agronomy trials only 5 were planted, other 4 trials (dual-purpose and sweet sorghum) were not conducted due to incessant rains.
4. In response to multicut forages to N levels trial, 120 kg N level was not superior over 100 kg, while both 80 and 100kg N levels were showing similar agronomic performances.
5. In sweet sorghum trail crop lodging was noticed in 20% of the entries. There was 20-30% stem borer damage in sweet sorghum trials..
6. Public private trial: SSG 27 (Lakshya seeds) and MFSH-4 (Mahyco) appeared better than others

### **8. Ludhiana**

1. All the forage sorghum trials were sown in the 3rd week of July due to continuous rain in June and first fortnight of July.

- Promising entries showing superior stalk yield and biomass include are entry nos 1001, 1003, 1013, 1014, 1026 and 1034.
- There was 10- 15 % stem borer incidence in dual purpose sorghum trials.
- In IVT(SC), 522 was early and 521 was susceptible to foliar diseases; In AVT (SC) there was poor germination in plot 210;
- SL 44 a forage variety from PAU is susceptible to foliar diseases.

#### **9. Hisar**

- The overall crop condition was good, but suffered lodging, zonate leaf spot due to excess rainfall received (563 mm in 31 rainy days).
- There was severe stem borer damage in most of the trials.
- All forage breeding seed production and agronomic, entomology and pathology trials were conducted. However, many of the breeding trials (Single-cut, especially) were vitiated due to continuous water logging in the field.
- Overall there was heavy infestation of stem borer (30- 50 %), shoot fly (15-20%) in tillers. Being a hot spot borer screening could be carried out effectively under natural infestation.
- Plants were affected due to salinity (~ 5%) during second week of July..

#### **10. Mauranipur**

- There was delay in planting due to heavy rains and water logging conditions. Plots were maintained in good conditions
- Six crosses of F2 populations (NRCS) and 11 crosses from Udaipur were in moderate conditions.
- Local germplasm from Bundelkhand (100 + 57 (white seeded)) collected in 2007 were planted.
- The plots were not maintained properly in Agronomy. Field boards were very small and not readable.
- No local check has been included in trial 1 K-c trial.

#### **11. Kanpur**

- Poor plant populations in sweet sorghum due low line area and stagnation of water.
- Moderate infestation of stem borer (< 6 damage rating).
- The shoot fly deadhearts % was very low (0-10 %), fish meal was not applied.
- Entomology trials were not maintained properly. Moderate infestation of stem borer (< 6 damage rating).

#### **12. Jhansi**

- Majority of the trials (75%) in Bundelkhand region were vitiated due to continuous and heavy rains. Flooding affected germination very severely.
- Five varieties/hybrids were grown in farmer's field (CSV 17, SPV 1616, CSH 23, CSH 16 and JJ 1022).
- FLDs were planted under the supervisions of KVK s of Jalon, Mahoba, Barari, Jhansi and Lalitpur.
- 95% of the trials were waterlogged and damaged. Of the remaining 5 % trials, the crop stand was not satisfactory.

### **Recommendations**

#### **Coimbatore and Bhavanisagar**

- Grain mold is not a major constraint for the farmers here in Coimbatore region. This centre should not be used for grain mold screening, any more.
- During visit of monitoring team, all concerned scientists of the station should be present.
- At Bhavanisagar, a scientist should be made responsible for the trials in future.

#### **Palem**

- SPV lines need sufficient seeds for testing before sending to respective centers.
- Fish meal application should be at appropriate time.
- Susceptible local check (PSV 2) should be sown in pathology trials.
- The special project on location specific need ex: yellow Jowar, rice fallow for Jowar etc should be taken up.

### Indore

1. Indore centre can be utilized for screening for stem borer.
2. The IPM trials need to be validated at farmer field in the next year since it has completed 2 years of studies.
3. The sources for shoot fly resistance which need to be registered should need to take required parameters (trichome density, vigor and glossiness scoring (1-9).
4. Higher quantity seed of test entries and checks need to be sent under agronomy trials.

### Deesa

1. Some evaluation trials should be laid at Deesa to control white grub.

### Pantnagar:

1. Due to heavy rains, hybrids could not be made. As requested by OIC, early planting in OSN may be considered. (OSN, Warangal).
2. The trials showing >50% plant stand (especially sweet sorghum) may not be considered for including in the all India data (Dr. SS Rao).

### Ludhiana, Hisar

1. Ludhiana is hot spot for stem borer and foliar diseases, the screening for biotic stress may be intensified.
2. Hisar may be good location for salinity and stem borer research.
3. A sample of trapping devise for field insect can be procured from DMR. This will be useful in pest survey work and population dynamics study at AICSIP centre

### Shortfall

1. **Coimbatore** : No pathologist was present during monitoring team visit.
2. **Bhavanisagar** : The plot selection was not proper for breeding trial.
3. **Palem** : Delay in fish meal application cause low incidence of shoot fly and
4. **Palem** : Absence of susceptible local check (PSV 2) in pathology trials.
5. **Indore** : Team coordination requires specially from breeder was lacking.
6. **Ludhiana** : Both Entomologist and Pathologist are new to work.
7. **Hisar** : Poor shape of entomology trial.
8. **Mauranipur** : Agronomy trial at was not properly maintained.
9. **Kanpur** : Entomology trial did not serve the purpose of screening.

**Table 1: Monitoring team members and travel schedule - Kharif 2008**

Zone	Centers	Team members	Touring dates (2008)	Days
I	Coimbatore	VR Bhagwat, C. Aruna	31 August-02 September, 2008	3
	Coimbatore	S Audilakshmi, AV Umakanth, IK Das	29-30 September, 2008	2
I	Palem	AV Gadewar, AV, Umakanth, Prabhakar, SS Rao, B. Subbarayudu	19 September, 2008	1
II	Indore	VR Bhagwat, V Rajaram	20-23 August, 2008	4
	Indore	AV Umakanth,	13-15, October 2008	3
II	Surat, Deesa	AV Gadewar, T Hussain, SK Jain, P. Singh, NB Rote	8-15, September, 2008	8
III	Udaipur	M Elangovan	September 8-12, 2008	5
III	Pantnagar, Hisar, Ludhiana	AV Gadewar, SS Rao, C Aruna, V Bhat. SK Jain, CV Sameer Kumar	24-28, September 2008	5
III	Mauranipur, Jhansi, Kanpur	Chari Appaji, VR Bhagwat	23-29 Sept, 2008	7

## Detailed monitoring team report

### Zone I - Coimbatore, Bhavanisagar & Palem

#### Team members

1. VR Bhagwat and C. Aruna : 31 August-02 September, 2008
2. S Audilakshmi, and AV Umakanth and IK Das : 29-30 September, 2008

#### Main observations

##### I-1: Coimbatore

##### *Plant breeding*

1. Scientists grow the breeding material during March to June. AICSIP trials are in the months of June to September and farmers grow sorghum during August – November.
2. Breeding trials were mostly sown during 2<sup>nd</sup> week of June and crops are in maturity stage.
3. Six irrigations were provided to the trials due to drought conditions. RH was relatively high and therefore there was heavy infestation of mite in some plots.
4. Stem borer and mites attack have caused drying up of some genotypes in all the trials.
5. Genotypes showing superior performance were 305,309, 308, 311, 602, 610, 617, 915, 910, 907, 908, 918, 911, 804, 812, 814, 815, and 855.
6. In the IASSVHT, entry nos. 1052 and 1055 were promising genotypes with high biomass.
7. Very good segregation was noticed in the cross nos. 08B GM 03 and 08R Agr 16 under national crossing block.
8. RM population did not show any variation for tillering, plant height and seed colour.

##### *Entomology*

1. Stem borer damage was moderate
2. Superior entries for stem borer are 603, 613, 623, 624, 801, 811, 821, 402, 403, and 426.
3. The shoot fly dead hearts % was low (0-20 in test material and susceptible check < 50%). The fish meal was not applied since the trial was evaluated for stem borer resistance.
4. The lines which had lower deadheart due to stem borer (<10%) were:
5. AVHT(GS): 603, 604, 613, 623, 624, 633, 643, 644, IHT (GS): 909, 910, 930, 931, 934, 951, 950, 976, 977, IVT(GS): 801, 811, 813, 821, 841, AVT (DP): almost all except 307, 323, IVT (DP): 402, 413, 414, 418, 426, AVT (SCF): 205, 216, 227, IVT (SCF): 501, 505, 510, 514, 523, AVHT (MCF): 103, 110, 117, 124, 131, 134, 135, 138, IVHT (MCF): 111, 125, 139

##### *Pathology*

1. Crops in pathology trials are in grain filling stage as they were sown one month later (16 July) than normal sowing, in expectation that rain during October will facilitate mold development and screening.
2. Coimbatore and adjoining areas have received around 60% (130 mm) of the normal rainfall (210 mm) during June to September this year, resulting in fewer incidences of foliar diseases (downy mildew, rust and leaf blight).
3. There was almost no rainfall after 1<sup>st</sup> week of September and grains of sorghum in breeding trials matured in rain-free conditions, resulting in low incidence of grain mold.
4. Entry No 610, 615, 902, and GMN-17 seemed susceptible to grain mold. Whereas entry No 603, 617, 855, 902, 907, 908, 912, and GMN-10 were almost free from grain mold.
5. In sweet sorghum trial, entry nos.1030, 1041, 1043, 1045, 1046, and 1057 showed moderate incidence of leaf diseases (leaf blight and rust).
6. Downy mildew was moderate on entry nos. 111 and 116 in leaf blight virulence nursery.

##### *Agronomy*

1. Maximization of yield experiment was impressive
2. The trials had good growth (height range 144 to 220 cm in trial 1.1, 124 to 175 cm in trial 4.1 and 53 to 117 cm in trial 3.1).

## **I-2: Bhavanisagar**

### *Plant Breeding*

1. Conducted three breeding trials (AVHT, IHT and IVT) sown on 8<sup>th</sup> July 2008
2. The yield trials were affected due to heterogeneity in the field and non-uniform plant stand.
3. Due to water stagnation in parts of the field, crop growth was not satisfactory due to low line area and stagnation of water.
4. The plot size for genotypes was not uniform in a trial. The expression of some genotypes was impressive.
5. Genotypes performing superiorly are 909, 908, 628, 625, 627, 635, 623 and 657
6. There was no incidence of foliar diseases, grain mold and pests in sorghum crop.

### **Recommendations**

1. Monitoring team may be sent during June to assess breeding material present with the scientist as trials and breeding materials are sown in different seasons.
2. Crops sown during normal sowing time of the region (June - July) often escape grain mold as they mature before major rainfall which starts in October. Therefore, grain mold is not a major constraint for the farmers here. This centre should not be used for grain mold screening, any more.
3. During visit of monitoring team, all concerned scientists of the station should be present. In case of absence due to urgency, alternate scientists should be given charge to explain experimental details to the monitoring team.
4. The mite infestation scoring (1-9) in Breeder's plot should be taken by Entomologist. Since the expression of mite is very good in some plots. .
5. RRS Bhavanisagar, a scientist should be made responsible for the trials.
6. Staff expressed desire to participate in Annual Sorghum Workshop, which may be considered.
7. The trials should be sown in appropriate fields next year for desirable expression.

## **I-3: Palem**

### **Team members**

1. AV Gadewar, SS Rao, Prabhakar, AV Umakanth and B. Subbarayudu : 19 Sep, 2008

### **Main observations**

#### *Agronomy*

1. The trial (1K-E) on agronomic investigations of advanced/ pre-released sorghum genotypes (dual-purpose) for their yield potential under rainfed conditions had stunted growth with native soil fertility level (F0 level) than in 50, 100 and 150% recommended dose of fertilizer. Visual differences were not seen between 100% and 150% RDF
2. The trial (3.1) on evaluation of public-private sector seeds sold in the market for yield potentials had shown some promising lines viz entry no 2007 and 2012. The crop stand and panicle emergence is good (90-95%). All entries heavily infected with Anthracnose,
3. The trials on maximization of Kharif sorghum yield and agronomic investigations of advanced/ pre-released sorghum genotypes for their yield potential under rainfed condition were not conducted due to change of Agronomist position.

#### *Breeding*

1. AVHT: low plant population in 604, 613 and 627. the promising entries -606, 605, 607, 615, 610, 617, 625, 624
2. AVT : promising entries 602, 622, 640, 632, 623, 641 IVT (Low pl population, stem borer attack)
3. IHT : Promising entries 921, 911, 912, 910, 902, 934, 937, 952, 962, 982
4. IVT: Overall all entries good, Mixture in plot no 402 and 406

#### *Pathology*

1. AVHT (G), IVT (G), IHT (G), AVT (dual) ,IVT(dual), AVT; forage. Yet to reach stage for GM recording, susceptible local check PSV2 not sown, leaf diseases in traces.

### *Entomology*

1. Seven trials were sown. The promising lines against shoot fly were AVHT (entry no 704, 605, 608, 609, 626, 63, 635 & 649), IVT (entries-817, 820, 836 & 853). IHT (entries 902, 914, 915, 917, 948, 949 & 951), PPT (plot no 332 was found promising).
2. In SPV lines there was poor germination.

### **Recommendations**

1. SPV lines need sufficient seeds and tested for germination before sending to respective centers.
2. The entomology trials need to be well plan at Palem. Fish meal application should be at appropriate time.
3. Susceptible local check (PSV 2) should be sown in pathology trials.
4. The research projects on location specific need ex: yellow jowar, rice fallow land for jowar etc should be taken up.
5. The new Agronomist joined recently, is interested to get help from NRCS on soil and plant sample analyses.

## **Zone II- Indore & Surat**

### **II-1: Indore**

#### **Team members**

1. VR Bhagwat and V Rajaram : August 20-23, 2008
2. AV Umakanth : October 13-15, 2008

#### **Main observations**

##### *Entomology Trials:*

1. The shoot fly dead hearts % was ranged from 15-90 in AVHT. IVT, IHT, SFN trials.
2. The fish meal was applied uniformly.
3. The plant population was poor (0.890%) in R lines due to old seeds. However the data was collected on survived plants for dead hearts.
4. The data on shoot fly is ready and will be sent by 25<sup>th</sup> August to NRCS. The lines which had lower dead heart due to shoot fly (<40%) were:
5. AVHT (entries 607, 610, 621, 630, 640, 652, 657 ) IHT (entries 909, 910, 930, 931, 934, 951, 950, 976, 977, 982) IVT (801, 802, 806, 816, 820, 821, 822, 823, 825, 844, 845, 846, 857), SFN-I (9, 10, 14, 24, 23, 24), SFN-II (7, 8- there was poor germination in 1 and 9). Local check trial (No entries were found lower than 40% deadhearts).
6. IPM trial: this was second season trial. Seed treatment with cruiser (Thiamethoxam) 70 Ws@ 3g/1 kg of seed was effective in controlling shoot fly (20% deadhearts) up to 45 days. The crop was intercropped with soybean (2:1) as one of the components in the treatment. The ICBR will be computed after harvesting of crop.

##### *Agronomy trials*

1. The trials no 1-3 had good growth and showed difference in plant growth. However the local check needs to be incorporated while comparing the improved hybrids/verities against different doses of fertilizers. This need to be look out while formulating work plan.

##### *Breeding Trials*

1. Material grown for registrations (GGUB 7, 52 and 50) was in good condition. However the material should have been grown in entomology block to observe its expression against shoot fly under artificial conditions. Sine the purpose of the trial was to confirm its resistance level against shoot fly.
2. F<sub>2</sub> population was grown for shoot fly resistance and noticed some low dead hearts plants.
3. Indore centre received only 584 mm of rainfall during the season against annual rainfall of 958mm. Yet, the crop expression was good (totally rainfed) because of even distribution of rainfall.
4. All of the breeding trials were sown as per plan on 25/6/08 and the crop was 111 days old.

5. In the AVHT (Grain Sorghum), the entries 602, 617, 603 and 606 were performing better while 608, 610 were mixtures. The entry 601 looked like germplasm and was severely affected by leaf diseases.
6. In the IHT, the entry 916 was promising with very long heads but was segregating for height. The entries 906, 915 and 909 were also promising. The entry 918 was partial sterile while 922 was mold and aphid susceptible.
7. In the IVT, 809 was tall and dual-purpose type while 817 was typical C-43 type. The entry 808 had lot of off types.
8. In the IVT (D.P), 407, 409, 400, 411, 436, 442 were tall and promising
9. In the AVT (Dual-purpose), 300 and 301 were promising types
10. In almost all the trials, stem borer infestation was high
11. In the coloured grain hybrids trial, the entry HN 5 was a tall red seeded hybrid and was promising
12. In the F<sub>2</sub>'s the crosses APK 1 x S 35 and TNS 586 x I-12 had poor germination
13. In the F<sub>2</sub>'s under National Crossing Block, the crosses 08R Agro 15, Agro 19, 08B SF 06 and 08B SF 13 threw desirable segregates.
14. SPV 1779 and SPSSV 6 performed better in grain and sweet sorghum trials respectively.

#### *Visit to KVK, Ujjain*

1. The kharif sorghum is grown about 2.33% in Ujjain district.
2. The OFT was grown at KVK farm and CSV 15, CSH 18, SPV 1616, JI 1941, 938 and 1022 were grown and observed at boot leaf stage. No disease and pest were noticed. The crop was grown after the seed treatment with cruiser.

#### *FLD visit:*

1. The seeds of JJ1022 and JJ 1041 (about 12-24 kg each) were distributed to KVK Sagar, Shajapur, Gwalior and Chhatarpur.
2. Whereas, at Dewas (Shathi village), CSH 23, JJ 1022, CSV 15, SPV 1616 and SSV 84 (5 kg each) were distributed to the farmers.
3. The Jowar at Shathi village was in good conditions. No insect pests were observed. However the farmer was not available on the spot for more interactions.
4. It was observed that most of the farmers in general have grown the *local Jowar* for fodder purpose due to delay in monsoon rains.

#### **Recommendations**

1. Indore centre can be utilized for screening for stem borer since in all the trials, stem borer infestation was high
2. The training cum orientation program on Production and protection Technology of sorghum and training on computer is needed to Indore staff.
3. The IPM trials need to be validated at farmer field in the next year since it has completed two years of studies.
4. The information and seeds on parental lines need to be provided to Dr Umakanth.
5. The sources for shoot fly resistance which need to be registered should need to take required parameters (trichome density, vigor and glossiness scoring (1-9).
6. The plant samples collected from the Agronomy trials (2005, 06) and sent to NRCS for analysis. No communication was received from PI Agronomist..
7. Higher quantity seed of test entries and checks need to be sent under agronomy trials.
8. Fertility reaction of test hybrids in IHT and AHT should be taken up at appropriate stages.

#### **II-2: Surat**

##### **Team members**

1. Drs AV Gadewar, Zote, T Hussain, JR Patel, D Jain, P Kumar : 8-15 Sept 08

##### **Main observations**

###### *General:*

1. Rainfall : up to August 1065mm
2. Water logging affected general condition of crop

### *Pathology*

1. In all the trials foliar diseases (Anthracnose & zonate leaf spot) appeared in traces.
2. Local check GJ42 have been used in AVHT,IVT,IHT but not in IVT dual, AVT dual, & AVT forage).
3. Four standard checks B58586, IS14332, IS14338, Bulk Y did not appear in IVT, IVT dual, AVT dual, AVT forage SC. This was due to less amount of seed + non germination + ploughed if low plant stand due water logging. These checks also had foliar diseases in traces.
4. Checks IS14332, IS14338, Bulk Y had poor stand in AVHT & IHT
5. IS14332 in AVT forage had more shoot fly damage.

### *Entomology*

There were 26 trials (for stem borer & shoot fly- GS, DP,SS, SCF,MCF), early (7/07/08) & late sown (30/07/08) for stem borer & shoot fly respectively. In general stem borer damage was less than shoot fly

1. In IHT- entry 903 heavy looked diseased but it was damage due to mites and also stem borer, 904 & 908 had moderate anthracnose. DJ6514 found tolerant/resistant to stem borer but susceptible to shoot fly.
2. IN IVT-DP, AVT DP (entry 301 & 300), IVT SC entry 506- stray incidence viral disease

### *Visit to Pancha farm*

1. The height of plant (all entries of AVHT) was about 2-3 ft.
2. Entries with poor germination: 660, 640, GJ38.
3. Comparatively better entries: RI: 606,611,619,612,615, 614; RII: 625,621,639,632,635,623; RIII: 655,651,642,657.
4. The entries had negligible incidence of foliar diseases.

## **Zone III - Deesa, Pantnagar, Hisar, Ludhiana, Mauranipur, Kanpur & Jhansi**

### **III-1: Deesa**

#### **Main observations**

##### *General*

1. Soils type : sandy
2. Rainfall -Only 350mm (up to 11 Sept; no rains since 14 August).
3. All trials irrigated twice but generally all trial showed water requirement, poor growth
4. damage due to white grub & water logging extensive
5. sowing spread from 2 July to 26 July

##### *Breeding*

1. *Anthracnose* a common disease appeared in all over but in traces.
2. *Local check* GJ 39 was highly susceptible to foliar diseases (anthracnose + zonate leaf spot).
3. *AVHT grain*- 19 entries, entries 902,915,950,970 better than other. Entry 916, 930 had heavy foliar diseases.
4. In IHT grain- 23 entries, no flowering in many lines, good entry 613, 635,650.
5. *IVT Grain*- 18 entries, better entries 804, 824,854. Foliar diseases in traces
6. *IVT Dual*- 15 entries. Better entries 400, 430
7. *AVt dual*- 8 entries, better entries – 302,309, 318
8. *Forage trial*- AVHT MC- 9 entries, Poor entries (germination & stand)-108,135. Better entries 103, 116, 138. IVHT MC- Poor entries 135, 114 & white grub damage, IVT SC – very poor plant stand
9. *Trial Advanced seed yield trial*– 14 entries, Good entries 206,228 (but moderate foliar diseases), 221,213.
10. *Germlasm evaluation trial*- entries 205, overall poor crop, Some lines not germinated, foliar diseases in IS 704, IS 3382
11. *F2 crosses*- Not satisfactory trial, damage due to shoot fly + white grub extensive. In material of cross SPV 1616 x Indore 12- only one plant showed good height & ear head. In rest plants are dwarf in general.

12. *Agronomy trials* (not satisfactory)- Two trials: In trial on Maximization of kharif sorghum yield the height of plant was about 2 feet though the population was OK, appear water stress. Other trial on agronomic investigation for dual purpose of advanced & prerelease trial plant population poor, white grub damage & poor plant height

#### **Recommendations:**

1. Phorate application had made at Dessa Centre to control white grub. This is recommendation against sucking pests. NRCS entomologist may recommend other crop protection measures.
2. Some evaluation trials should be laid at Deesa to control white grub & centre should seek entomological help from GAU.

### **III-2: Pantnagar, Hisar and Ludhiana**

#### **Team members**

1. Gadewar, SS Rao, Aruna C, V Bhat, SK Jain and CV Sameer Kumar :24-28, Sep. 2008
2. VR Bhagwat : July 14- 18, 2008 (Hisar)
3. VR Bahgawat : 13-16 October, 2008 (Ludhiana)

#### **Main observations**

##### **Pantnagar**

1. All single cut trials were sown during last week of June and second week of July and multi cut forage sorghum were sown in the third week of May 2008.
2. During June-Sept. about 2000 mm rainfall was received which was 120 % more over the normal (900 mm). Hence, sowing of some trials were delayed in June & July. These rains resulted in lodging, foliar disease (anthracnose, zonate leaf spot) in most of the trials.
3. Plant population was below normal in some trials especially in the initial and advanced sweet sorghum evaluation trail. The overall crop condition was satisfactory. The damage was severe in August planting.
4. Regeneration was poor in multi-cut trials owing to rotting due to excess rainfall..
5. Of the 9 agronomy trials only 5 were planted, other 4 trials (dual-purpose and sweet sorghum) were not conducted due to incessant rains. Four trials in forage sorghum were organized namely, a) response of single cut forage sorghum to Nitrogen levels, b) Intercropping of single cut forage sorghum based studies c) response of multicut forage sorghum cultivars to 'N' levels, and (d) INM of forage sorghum based cropping system were conducted. In response to multicut forages to N levels trial, 120 kg N level was not superior over 100 kg, while both 80 and 100kg N levels were showing similar agronomic performances.
6. In sweet sorghum trail crop lodging was noticed in 20% of the entries. There was 20-30% stem borer damage in sweet sorghum trials.
7. Due to heavy rains hybrids could not be made. Hence, early planting in OSN Warangal was requested by the station in-charge for making multicut hybrids.
8. The lines which appeared promising were recorded: AVT(SC): 223 was taller and good, 229 had poor germination, taller with lodging; 228 and 233 were infested with foliar diseases (anthracnose mainly). IVT(SC): 525, 526 were good. 527 were infested with anthracnose.
9. AVHT (MC): 103 was better (3 cuts taken; 70-90 kg/21 sq.m), IVHT (MC): 111 was good (3 cuts taken; 40-55 kg/12 sq.m), IAVHTSS: 1000, 1013, 1014 and 1017 were good; furrow sowing or earthing-up was required (as in case of AVHT DP); 1007 had poor germination, damaged by stalk rot; 1004 had lodging.
10. Public private trial: SSG 27 (Lakshya seeds) and MFSH-4 (Mahyco) appeared better than others

##### **Ludhiana**

1. All the forage sorghum trials were sown in the 3rd week of July due to continuous rain in June and first fortnight of July. The crop is irrigated once in 10 days because the soil is sandy loam. The overall crop condition was satisfactory but suffered lodging, due to excess rainfall received.
2. Promising entries showing superior stalk yield and biomass include SNo (coded) 1001, 1003, 1013, 1014, 1026 and 1034.

3. The sowing was done with 30cm row spacing without thinning. In Agronomy, one trial on INM single cut forage sorghum is planted.
4. There was 10- 15 % stem borer incidence in dual purpose sorghum trials.
5. Only 2 cuts were taken in multicut trials (MAT and MIT)
6. In IVT(SC), 522 was early and 521 was susceptible to foliar diseases; In AVT (SC) there was poor germination in plot 210;
7. Four entomology trials were laid out, the screening for shoot fly was done under natural infestation. The promising entries were AVHT (MC): 102, 104, 106, 113, 116, IVHT (MC) :130, 139, 154, AVT (SC) : 206, 205, 204, IVT (SC): 502, AVHT (SS): 1001, 1003, 1013, 1014, 1026 and 1034.
8. SL 44 a forage variety from PAU is susceptible to foliar diseases .

#### **Hisar**

1. The overall crop condition was good, but suffered lodging, zonate leaf spot due to excess rainfall received (563 mm in 31 rainy days). There was severe stem borer damage in most of the trials.
2. All forage breeding seed production and agronomic, entomology and pathology trials were conducted. However, many of the breeding trials (Single-cut, especially) were vitiated due to continuous water logging in the field, as water level has gone up. The crop growth was very poor in the entomology, pathology and public private trials, hence was suggested to record observations in the breeding trials where possible.
3. The dual purpose sorghum trial entries had flowered. There were heavy damages in some IVT entries, particularly in 420. 440 and 442 were early. In AVT, 304 and 312 were early.
4. The RIL material provided by Dr. Madhusudhana could not be sown due to heavy rains.
6. Overall there was heavy infestation of stem borer (30- 50 %), shoot fly (15-20%) in tillers. Being a hot spot borer screening could be carried out effectively under natural infestation.
7. The experimental and analytical activities in the biochemistry and animal nutrition were also observed.
8. Plants were affected due to salinity (~ 5%) during second week of July..

#### **Recommendations:**

#### **Pantnagar:**

1. Due to heavy rains, hybrids could not be made. As requested by OIC, early planting in OSN may be considered. (OSN, Warangal).
2. The trials showing >50% plant stand (especially sweet sorghum) may not be considered for including in the all India data (Dr. SS Rao).

#### **Ludhiana**

1. Ludhiana is hot spot for stem borer and foliar diseases, the screening for biotic stress may be intensified.
2. Since both Entomologist and Pathologist are new to work, need training in their respective areas.

#### **Hisar**

1. The entomology trial was in poor shape as field was waterlogged (low lying) . Hence they were advised to record stem borer data from the breeding trials as pesticides are not applied
2. Hisar may be good location for salinity and stem borer research.
3. A sample of trapping devise for field insect can be procured from DMR. This will be useful in pest survey work and population dynamics study at AICSIP centre

#### **III-3: Jhansi, Mauranipur, Kanpur**

1. Chari Appaji and VR Bhagwat : 23-29 Sept , 2008

#### **Mauranipur**

##### *Breeding*

1. There was delay in planting (17<sup>th</sup> July and 30<sup>h</sup> July, 2008) due to heavy rains and water logging conditions.
2. There was mixtures (5%) of Bajra plants in AVHT-II (entry no 624).
3. Six crosses of F2 populations (NRCS) and 11 crosses from Udaipur were in moderate conditions.
4. Local germplasm from Bundelkhand (100 + 57 (white seeded)) collected in 2007 were planted.
5. The plots were maintained in good conditions although there was delay in planting.

### *Agronomy*

1. Three trials were grown (Trial no 1.1, 3.1 and 4.1).
2. The plots were not maintained properly. There was delay in sowing due to heavy and continuous rains.
3. Field boards were very small and not readable.
4. No local check has been included in trial 1 K-c trial.

### **Jhansi**

#### **Inter institutional project in Bundelkhand region**

##### **Trials in farmer's field through IGFR, Jhansi:**

1. A total of 127 farmers field trials were laid down by IGFR Jhansi in 3 districts of UP and 3 districts of MP Bundelkhand region.
2. Majority of the trials (75%) in farmers field were vitiated due to continuous and heavy rains. Flooding affected germination very severely. The rainfall recorded 1114 mm (June: 385 mm, July: 265.69 mm, August: 286.03 mm, and till 23<sup>rd</sup> Sept: 175.24 mm).
3. Five varieties/hybrids were grown in farmer's field (CSV 17, SPV 1616, CSH 23, CSH 16 and JJ 1022).
4. Visited trials at Chhattarpur and Datia district.

##### **Trials in farmer's field through AICSIP, Mauranipur.**

1. A total of 45 trials with 6 improved cultivars were undertaken.
2. The sowings were taken up during June last week to July 10<sup>th</sup>, 08
3. Flooding affected germination very severely. The rainfall recorded 1114 mm (June: 385 mm, July: 265.69 mm, August: 286.03 mm, and till 23<sup>rd</sup> Sept: 175.24 mm).
4. All the trials were vitiated and farmers were advised to plough the trial.

##### **Trials in farmer's field through KVKs**

###### KVK, Jalori

1. 15000 ha sorghum was grown in Jalori district mostly under undulated soils.
2. The seeds of four lines (SPV 1616, CSV 17, CSH 16, CSH 23) were distributed in three villages to 15 farmers on each village (Rura Jaitia, Dharampura and Ala village).
3. The crops were sown in between 26-06 to 23-07-2008 depending upon availability of time.
4. The crops were damaged due to heavy rains.
5. The crop cafeteria (Demo plots) were in good shape, however there was heavy animal grazing in Bundela and CSH 16 plots.
6. It was decided to hold a field day on 16<sup>th</sup> Oct'08.

###### KVK Mahoba

1. 72 farmers were involved in the trials organized through KVK Mahoba in an area of about 29.5 ha.
2. Heavy and continuous rainfall was recorded 1114 mm (June: 352 mm, July: 285.69 mm, August: 266.03 mm, and till 3<sup>rd</sup> Sept: 5 mm).
3. Sowings were undertaken during the month of July 2008, however due to continuous and heavy rainfall (a record since last 10 years in the district), and flooding of the fields, over 95% of the trials were waterlogged and damaged. Of the remaining 5 % trials, the crop stand was not satisfactory.

###### KVK Barari, Jhansi

1. 71 farmers were involved for the conduct of the trials in farmers fields
2. 4 cultivars CSH 16, CSH 23, CSV 17 and SPV 1616 were demonstrated in the farmers field ; as strip plot ; and at KVK centre's farm.
3. A record rainfall of 1262.7 mm was received from June till 23<sup>rd</sup> Sept 08, the rainfall was continuous.
4. The sowings were undertaken from last week of June till 10<sup>th</sup> July 2008.
5. Due to heavy and continuous rain and water stagnation, more than 95% of trials failed and these farmers ploughed their fields.
6. Of the remaining 5 % trials, we visited trials block, where strip plot trials was undertaken. The crop stand is satisfactory and it was decided to hold a field day during the 3<sup>rd</sup> week of Oct'08. (18<sup>th</sup> Oct'08).

### KVK, Lalitpur

1. A total of 27 trials were organized in 4 villages with SPV 1616, CSH 16 and CSV 17.
2. The sowings were undertaken during the last week of June till 10<sup>th</sup> July 2008.
3. Majority of the trials (85%) had to be ploughed back due to flooding after germination.
4. The field day was organized by the KVK in the village Cadasarakala to show the performance of CSV 17, a early duration variety, in which 70 farmers, extension officials participated.
5. Explaining the characteristics of the variety, the programme coordinator, KVK Dr. Chavan, explained that this variety was suitable for the district.

### **Kanpur**

#### **Sweet sorghum and forage trials**

1. The trials were sown on 24<sup>th</sup> August, 2008.
2. Poor plant populations due low line area and stagnation of water.
3. The trials were not maintained properly.
4. Moderate infestation of stem borer (< 6 damage rating).

#### **Entomology Trials**

1. Total 9 trials (**GS**: AVHT, IVT, AHT, **DP**: AVT, IVT, AVT, Local check testing, SBN, and new F2 and F3 populations for stem borer resistance.
2. The trials were sown on 24<sup>th</sup> August, 2008.
3. Poor plant populations due low line area and stagnation of water.
4. The shoot fly dead hearts % was very low (0-10 %)
5. Fish meal was not applied although the instructions were given during Agm08 at Akola.
6. Entomology trials were not maintained properly.
7. Moderate infestation of stem borer (< 6 damage rating).

#### **Sweet sorghum trials with KVKs**

1. The trials were sown in Etwaha, Kanpur dehat Due to continuous rainfall, the crop was effected after germination, which was vitiated as per the information given by Programme coordinators of KVKs.

#### **Zonal Coordination of KVK- review meeting at Kanpur:**

1. Organized and participated in the meeting to review the sorghum situation in Bundelkhand region of Uttar Pradesh in association with ZC Unit Kanpur on 27<sup>th</sup> Sept'08.
2. About 30 KVKs from UP were participated in the meeting.
3. It was concluded from the discussion with KVK s that about 20 % sorghum was survived at few KVK (Chitrakut, Jalon Mahoba, Lalitpur, Harmirpur, and Bharari).
4. The base line data on farmers was being collected by KVK.
5. Decided to organize two field days (Bharari and Jalon).

#### **Recommendations**

1. Three field days in collaboration with IGFR, Jhansi, and KVKs at Jalon and Bharari was proposed to organize.
2. The base line data on Farmers field need to collect within one month. Dr Chari will sent reminders to the KVK .
3. The preference of Bundelkhand farmers is white seeded sorghum. The research efforts in collaboration with NRCS need to strengthen.
4. The germplasm collected by Dr Sachan in Bundelkhand region need to evaluate at other locations for its traits identification.
5. Observations on stem borer damage in forage, sweet sorghum breeding and entomology trials were suggested to entomologist.
6. The entomology trials at Kanpur need much attention of entomologist posted at Kanpur. Since no fish meal and no proper observations were taken by entomologist. Suggested to replace the entomologist at Kanpur.

### Annexure-I: Promising entries from AICSIP trials

(based on visual scoring (1-9) by team members during monitoring tour )

Tour details					Promising entries-code number from breeding trials											
Centers	Team	Start date	End date	Tour days	AVHT-GS	IHT-GS	IVT-GS	AVT-DP	IVT-DP	AVT-SCF	IVT-SCF	AVHT-MCF	IVHT-MCF	Sweet Sorghum	Agronomy	
Coimbatore	Bhagwat, Aruna	31-Aug	2-Sep	3												
Coimbatore	Audilakhmi, Umakanth, IK Das	29-Sep	30-Sep	2												
Palem	Gadewar, Umakanth, Prabhakar, SS Rao, Subbarayudu	19-Sep		1	606, 605, 607, 615, 610, 617, 625, 624	912, 911, 912, 910, 902, 934, 937, 952, 962, 982			402, 406						CSV 15 in DP & 2007 , 2012 in PPT	
Indore	Bhagwat, V Rajaram	20-Aug	23-Aug	4												
Indore	Umakanth	13-Oct	15-Oct	3	602, 617, 603, 606	916, 906, 915, 909	809	300, 301	407, 409, 400, 411, 436, 442						SPV 1779, SPSSV 6	
Surat, Deesa	Gadewar, Hussain, P. Singh, DK Jain	8-Sep	15-Sep	8	622, 613, 609, 608, 601, 607, 635, 639, 628, 622, 644, 650, 649,	967, 961, 952, 930, 902, 915, 910, 901, 948, 941, 950, 981, 978, 976, 970	804, 813, 833, 853, 808, 836, 834, 824, 849, 854, 856	302, 305, 307	435, 406, 400, 409, 403, 422, 441, 418, 444, 428, 430	209, 210, 204, 211, 212, 228, 226, 232	109	112, 114, 111, 126, 143, 139, 103, 104, 108, 118, 115, 120, 116, 132, 138, 131, 116, 118, 115, 158, 153, 154	509, 504, 503, 502, 518, 512, 520, 527, 506, 507, 502, 519, 526	1001	AYT: 206, 210, 209, 211, 216, 213, 221, 220, 222, 228, 233, 225, 227	
Udaipur	Elangovan, Shyam Prasad	8-Sep	12-Sep	5	602, 603, 605, 608, 619	904, 912, 920, 921, 934, 964, 968, 971	809, 812, 813, 816	302	406, 410,							
Mauranipur/Jhansi/ Kanpur	Chari Appaji, Bhagwat	23-Sep	29-Sep	7												
Pantnagar, Hisar, Ludhiana	Gadewar, V. Bhat, Shyam Prasad, SS Rao Aruna, Dk Jain	24-Sep	28-Sep	5					320, 302	223, 206, 211	525, 526, 527	111, 103, 102		1000, 1013, 1014, 1017, 1006, 1007	SSG 27, MFSH-4 good in PPT	
Coimbatore	Bhagwat, Aruna	31-Aug	2-Sep	3	603, 604, 613, 623, 624, 633, 643, 644 (all for SB)	909, 910, 930, 931, 934, 934, 951, 950, 976, 977 (all for SB)	801, 811, 813, 821, 841 (all for SB)		402, 413, 414, 418, 426 (all for SB)	205, 216, 227 (all for SB)	501, 505, 510, 514, 523 (all for SB)	103, 110, 117, 124, 131, 134, 135, 138 (all for SB)	111, 125, 139 (all for SB)			
Coimbatore	Audilakhmi, Umakanth, IK Das	29-Sep	30-Sep	2												
Palem	Gadewar, Umakanth, Prabhakar, SS Rao, Subbarayudu	19-Sep		1	704, 605, 608, 609, 626, 663, 635, 649	902, 914, 915, 917, 948, 949, 951	817, 820, 836, 853								ppt 332	
Indore	Bhagwat, V Rajaram	20-Aug	23-Aug	4	607, 610, 621, 630,	909, 910, 931, 934,	801, 802, 806, 816,									

					640, 652, 657 (all SF)	951, 950, 976, 977, 982-all SF	820, 821, 822, 823, 825, 844, 845, 846, 857-all SF								
Surat, Deesa	Gadewar, Hussain, P. Singh, SK Jain	8-Sep	15-Sep	8											
Udaipur	Elangovan, Shyam Prasad	8-Sep	12-Sep	5	604, 608, 617 (all for SF)	901, 902, 909, 919, 920 (all for SF)	800, 807, 816, 826, 828, 830 (all for SF)	302, 304, 305 (all for SF)	402, 404, 406, 419, 441 (all for SF)	201, 203, 204, 205, 206, 208, 209, 210, 211 (all for SF)	501, 503, 505, 508 (all for SF)	102, 107, 110 (all for SF)	111, 112 (all for Sf)		
Mauranipur/Jhansi/Kanpur	Chari Appaji, Bhagwat	23-Sep	29-Sep	7	No differences for biotic stress	No differences for biotic stress	No differences for biotic stress	No differences for biotic stress	No differences for biotic stress	No differences for biotic stress	No differences for biotic stress	No differences for biotic stress	No differences for biotic stress		
Pantnagar, Hisar, Ludhiana	Gadewar, V. Bhat, Shyam Prasad, SS Rao Aruna, DK jain	24-Sep	28-Sep	5						206, 205, 204 (all SF)	502( for SF)	102, 113, 116 (all Sf)	130, 139, 154 (all SF)	1001, 1003, 1013, 1014, 1026, 1034 (all SF)	
<b>Tour details</b>					<b>Promising entries-code number from pathology trials</b>										
Centers	Team	Start date	End date	Tour days	AVHT-GS	IHT-GS	IVT-GS	AVT-DP	IVT-DP	AVT-SCF	AVHT-MCF	IVHT-MCF	SPV Trials	Sweet Sorghum	Agronomy
Coimbatore	Bhagwat, Aruna	31-Aug	2-Sep	3											
Coimbatore	Audilakhmi, Umakanth, IK Das	29-Sep	30-Sep	2	603, 617	902, 907, 908, 912, GMN -10								1030, 1041, 1043, 1045, 1046, 1057	
Palem	Gadewar, Umakanth, Prabhakar, SS Rao, Subbarayudu	19-Sep		1											
Indore	Bhagwat, V Rajaram	20-Aug	23-Aug	4											
Surat, Deesa	Gadewar, Hussain, P. Singh, SK Jain	8-Sep	15-Sep	8	606, 611, 619, 612, 813, 650, 615, 614, 625, 621, 639, 632, 635, 623, 655, 651, 642, 657	902, 915, 950, 970	804, 824, 854	302, 309, 318	400, 430		103, 116, 138				
Udaipur	Elangovan, Shyam Prasad	8-Sep	12-Sep	5									SPV Nos 59, 336, 351, 772, 839, 981, 1022, 1155, 1283, 1394, 1438, 1440, 1441, 1442, 1473, 1686, 1689, 1696, 1697, 1797, 1735, 1744, 1745, 1753	1001, 1003, 1014, 1023, 1041, 1043, 1054	MF 5, UTFS 49, CSH 16, CSH 23, SPV 1782, SPH 1596, CSV 17 (for yield)
Mauranipur/Jhansi/Kanpur	Chari Appaji, Bhagwat	23-Sep	29-Sep	7											
Pantnagar, Hisar, Ludhiana	Gadewar, V. Bhat, Shyam Prasad, SS Rao Aruna	24-Sep	28-Sep	5								116			