**Multilocation evaluation of the identified accessions:** Thirty one already identified promising accessions for high yield and oil content were evaluated at three locations with two replications along with 2 checks (DRSF113 and Morden) at IIOR, Hyderabad, Solapur and Savalvihir. Eight germplasm accessions recorded higher yield than the national check (DRSF113). GMU-799 followed by GMU-189 and GP2 1217 recorded highest seed yield in evaluation trial (Fig1). These germplasm accessions will be provided to the AICRP centers for development of new populations and inbred development.

**Identification of trait specific germplasm:** Identification of trait specific germplasm lines is regular activity. The germplasm accessions which were identified during 2014 from working sunflower germplasm for high yield (40 -46g/plant), high oil (40-42%) and high test weight (9-10g/100 seeds) is presented in the following table.

**Table: Trait specific germplasm list (IIOR,Hyderabad)**

|  |  |  |
| --- | --- | --- |
| **Trait** | **Germplasm** | **Breeding material** |
| High yield  (40 -46g/plant) | GMU-440;GMU-776;GMU189;GMU779;GMU-211,GMU286,GMU571,GMU1032,GMU 503 , GP91101 ; GMU 1075/EC-512683 , GMU 1108/ EC-512746 ,GMU438, GP6714,GP6271,GP6-571,GP6-951,GP61475,GP6-644,GP6-211,GP6-1227,GP6-286,GP2-1227, GP6-1254 , GP4-745 | ARM243B,CMS234B;17A;7-1A; |
| High oil  (40-42%) | GMU-817,GMU-1199,GMU-1048,  GMU-1116,GMU-242,GMU-205,  GMU-1079,GMU-405,GMU-474,  GMU-266,GMU-902,GMU-821  GMU-366,GMU-673,GMU-42  GMU-236,GMU-1200-1,GMU-830  GMU-804, EC-601848, EC-601935, EC-601853 , EC-601827-1,EC601999  EC601845,EC601999, EC601628 | 6D1 |
| High test weight (9-10g/100 seeds) | GMU-510 , GMU-525, GMU-556 , GMU-561 , GMU-1218, GP4-1723 , PSCRM-127 | -Nil- |

**Sunflower germplasm supplied by IIOR during the last five years to various centres**

Supply of germplasm accessions to the concerned researcher is regular activity of IIOR Gene Bank.Sunflower germplasm or genetic stock supplied by IIOR during the last five years to various centres is presented in the following table. This material is used by researchers in their breeding programme.

|  |  |  |
| --- | --- | --- |
| **Centre** | **Material** | **Total** |
| Akola | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %), non dormant accessions | 297 |
| Bengaluru | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %) | 252 |
|  | F1 interspecific hybrids, wild species | 14 |
| Coimbatore | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %), medium oleic lines | 85 |
|  | Wild species | 5 |
| Dholi | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %) | 157 |
| Hissar | Prebred lines, R,High yielding (>37 g) and medium oil (~38 %), early lines | 27 |
| IIOR | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %) | 895 |
| Latur | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %), non dormant accessions, prebred lines | 490 |
|  | Wild species | 5 |
| Nandyal | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %), non dormant accessions | 120 |
| Nimpith | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %), prebred lines | 244 |
| Ludhiana | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %), prebred lines | 211 |
|  | Wild species | 1 |
| Raichur | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %), PM/Alterneria tolerant lines | 109 |
|  | Wild species | 10 |
| Savalvihir | CMS, R, inbreds, High yielding (>37 g) and medium oil (~38 %), non dormant accessions, prebred lines | 260 |
|  | Total | 3182 |

**Multi location evaluation of germplasm accessions:** A trial with medium maturing genotypes was constituted during *kharif* 2016-17. In a trial 35 germplasm accessions including check (DRSF 113) was evaluated at Akola, Latur, Nandyal, Raichur and IIOR in two replications. Two genotypes GMU 635 (17.93g) and GMU296 (18.83g) recorded more seed yield per plant than check DRSF-113 (17.64) represented in fig 2. Accessions PSCIM 199 matured in 75 days with yield potential of 14.47 g per plant. All the genotypes were matured within the range of 75 to 90 days.

**Conduction of germination test:** Germination test of 372 accessions were carried out to test the viability of the material harvested during December 2015 and March 2016.Germiation test was carried out in petriplatees in laboratory. 10 seeds per accessions were kept for germination in germinator for germination test. Out of 372 accessions 272 accessions observed more than 70 percent germination. Based on the germination test the accessions were deposited in the cold storage for medium term storage.150 accessions showed 100 percent germination in the germination test (Fig1).

**Generation of crosses for identification of maintainer/ restorer reaction**

10 best inbred for high seed yield and oil content were utilized in crossing with *Helianthus petiolaris* background two CMS lines i.e. CMS234 A and ARM243A. The F1 crosses were studied by visual observation to identify the maintainer/ restorer reaction. The performance of inbred lines and maintainer/ restorer reaction is given in following table. All the inbreds except DRSI-305 restored fertility in CMS 234A and all the inbreds except DRSI-100 and 305 restored fertility in ARM 243A. Partial restorer reaction was indentified for inbred DRSI-160 in both the CMS lines.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Inbred** | **Seed yield/plant (g)** | **Oil content (%)** | **CMS234A**  **R M PR** | | | **ARM243A**  **R M PR** | | |
| **DRSI-1** | 35 | 36 | R |  |  | R |  |  |
| **DRSI-3** | 30 | 37 | R |  |  | R |  |  |
| **DRSI-9** | 34 | 37 | R |  |  | R |  |  |
| **DRSI-10** | 31 | 37 | R |  |  | R |  |  |
| **DRSI-100** | 38 | 37 | R |  |  |  | M |  |
| **DRSI-133** | 32 | 36 | R |  |  | R |  |  |
| **DRSI-144** | 32 | 36 | R |  |  | R |  |  |
| **DRSI-160** | 34 | 36 |  |  | PR |  |  | PR |
| **DRSI-182** | 36 | 35 | R |  |  | R |  |  |
| **DRSI-224** | 30 | 35 | R |  |  |  |  |  |
| **DRSI-256** | 39 | 35 | R |  |  | R |  |  |
| **DRSI-305** | 34 | 35 |  | M |  |  | M |  |

Where R= Restorer; M=Maintainer; PR=Partial Restorer