PGR Management and Use – COMPONENT I

Annual Progress Report for the year 2014-15 & 2015-16

1. **Name of the Crop**: SAFFLOWER
2. **Name of the Lead Centre**: ICAR-Indian Institute of Oilseeds Research, Hyderabad
3. Name of the Nodal person with designation: Dr. N. Mukta, Principal Scientist (Economic Botany)
4. **Name of the collaborating centres**: COA, AICRP (Safflower) Centre, Solapur
5. Name of Nodal person with designation: Dr. S. K. Shinde, Breeder, AICRP (Safflower)
6. **Number of accessions received from ICAR-NBPGR**: 2000 (2014-15)
   1400 (2015-16)
7. **Number of accessions sown for characterization/multiplication**: 2000 (2014-15)
   1400 (2015-16)
8. **Number of accessions germinated and data were recorded**:
   2014-15 IIOR:1600; Solapur: 1710
   2015-16 IIOR: 1365; Solapur: 1262
9. **Experimental design**: Augmented block design
10. **Checks used**: A-1, PBNS-12
11. **Details of the characterization**:

2014-15

Sl. No.	**Name of the Centre**	**No. of accessions characterized/ multiplied**	**Date of sowing (From – to)**	**No. of descriptors***	**Date of harvesting (From – to)**	**Date of dispatch of data and seed material to NBPGR**	
						Seed	Data
1	IIOR, Hyderabad	Characterised: 1600 Multiplied: 1989 Seeds submitted: 1450	22.10.2014-30.10.2014	30	15.04. 2015 - 31.05.2015	16.12.2015 - 12.01.2016	8.03.2016
2	COA, AICRP (Safflower) centre, Solapur (MPKV, Rahuri)	Characterised: 1710 Multiplied: 1901 Seeds submitted: 801	26.09.2014-29.09.2014	30	12.02.2016-16.02.2016	2.01.2016	8.03.2016

2015-16

Sl. No.	Name of the Centre	No. of accessions characterized/ multiplied	Date of sowing (From – to)	No. of descriptors*	Date of harvesting (From – to)	Date of dispatch of data and seed material to NBPGR	
						Seed	Data
1	IIOR, Hyderabad	Characterised: 1365 Multiplied: 1365 + 404	20.10.2015-30.10.2015	23	17.2.2016 - 15.04. 2016	To be submitted	To be submitted
2	COA, AICRP (Safflower) centre, Solapur (MPKV, Rahuri)	Characterised: 1211 Multiplied: 1211+ 943	23.9.2015-30.9.2015	22	12.2.2016-16.2.2016	Seed despatched for 25+251 accessions on 23.3.2016	Data compilation in progress

* list of descriptors/descriptor states attached

12. **Same descriptors were used at all the locations**: Yes

13. **Detailed report on salient achievements of characterization with details of promising lines identified for important characters**:

IIOR, Hyderabad

2014-15

Based on evaluation data of 1600 accessions recorded during 2014-15, the following trait specific accessions were identified for confirmation.

Specific trait	No of accessions	National identity of accessions
High oil content (>35%)	8	EC138463, EC398091, EC398223, EC398226, EC398229, EC398291, EC478434, EC566057
Appressed plant type	7	EC181393, EC478383, EC565890, EC565968, IC337961, IC337962, IC499440
High number of effective capitula (≥ 75)	13	EC31373, EC33963, EC99303, EC100523, EC181615, EC181957, EC210577, EC566037, EC566052, IC147760, IC337685, IC499962, IC499965
High seed yield (> 50g/plant)	71	EC565998, EC566004, EC566013, EC566037, IC499434, IC499557, IC499812, IC499965, IC499968, IC500002 (best 10)

Head size >2.75 cm	12	EC137340, EC478382, EC478394, EC478396, EC478397, EC478404, EC478433, IC253209, IC338252, IC499725, IC499959, IC500029

Year: 2015

Safflower germplasm cum breeders day was organised on 12.02.2016 at IIOR-ICRISAT farm. Twelve safflower breeders/other researchers from 6 AICRP (Safflower) centres, safflower scientists from IIOR and four scientists from NBPGR, New Delhi and NBPGR Regional Station, Hyderabad observed the variability in the germplasm.

Data recording has been completed for 22 traits; recording for post harvest traits is in progress for 1365 accessions sown in *rabi* 2015-16.

COA, AICRP (Safflower) centre, Solapur (MPKV, Rahuri)

Year: 2014

In addition to 60 accessions identified for high seed yield, the following trait specific accessions were short listed for confirmation.

Specific trait	**No of accessions**	**National identity of accessions**
Appressed plant type	7	EC-159614, EC-159631, EC-181246, EC-181384, EC-181815, EC-210451-1, IC302683
Small capitula	7	EC-158962, EC-159641, EC-175434, EC-211331, IC405960, IC500058, IC500074
Attractive petal colour	4	EC-181343, EC-210418, IC253099, IC302692
Very late rosette	10	EC-38939, EC-159652, EC-159671, EC-181160, EC-181674, EC-181761, EC-181791, EC-182161, IC253083, IC500065

Year: 2015

Crop growth and seed filling were affected due to severe drought during this season. The following trait specific accessions were identified for confirmation.

Specific trait	**No of accessions**	**National identity of accessions**
High yielding accessions	13	IC-442763, IC-442766, IC-442908, IC-442930, IC-442957, IC500165, IC-508923, IC-546545, IC-597252, IC-597258, IC-597260, IC-597266, EC-0542464

Appressed plant type	20	IC-442953, IC-442928, IC-442929, IC-442930, IC-442931, IC-442932, IC-442933, IC-442934, IC-442935, IC-442936, IC-442937, IC-442938, IC-442939, IC-442940, IC-442941, IC-442942, IC-442943, IC-442944, IC-442945, IC-442946
More foliage	1	IC-511266
Longer primary braches	1	IC-537573
Attractive petal colour	4	IC-442974, IC-499664, IC-500092, IC-508925
Very late rosette	15	IC-500127, IC-500129, IC-500146, IC-500148, IC-500151, IC-500171, IC-500173, IC-500176, IC-500178, IC-500185, IC-500191, IC-500192, IC-500194, IC-544936, IC-544949

14. **Details of monitoring**:

Sl. No.	Name of the Centre	Date of monitoring	Crop stage at the time of monitoring	Monitoring team members
1	IIOR-Hyderabad	19.01.2016	Flowering	Dr. J. Radhamani, PS, NBPGR, New Delhi
2	COA, AICRP (Safflower) centre, Solapur (MPKV, Rahuri)	15-16.12.2015	Flowering	Dr J Aravind, Scientist NBPGR, New Delhi
		07.01.2016	Flowering & seed filling	Dr. N. Mukta, Principal Scientist & PI, AICRP (Safflower), Hyderabad
		28.01.2016	Flowering & seed filling	Dr. Sushil Pandey, Sr. Scientist, NBPGR, New Delhi

15. **Papers Published**: Nil

(i) Papers published in peer reviewed journal (NAAS rating may be given)

(ii) Papers presented at scientific meetings:

(iii) Manuscripts under preparation:

16. **Patents/varieties and products developed or in pipeline**: Nil

Signature:

Name: Dr. N. Mukta
Designation: Principal Scientist (Economic Botany)
& Principal Investigator
Date: 13.05.2016

Dr. K. S. Varaprasad
Director
ICAR-Indian Institute of Oilseeds Research, Hyderabad- 500 030

Safflower Descriptors for CRP-Agrobiodiversity Component I
Crop : Safflower
Centre: ICAR-Indian Institute of Oilseeds Research & COA, Solapur

S.No.	Characteristics	States
1.	Growth habit	1 Erect 2 Bushy 3 Appressed
2.	Location of branches on main axis	0 No branches 1 Predominantly basal 2 Predominantly on upper third of the plant 3 Predominantly on upper two thirds of the plant 4 From base to apex
3.	Stem colour	1 White 2 Green 3 Other
4. *	Internode length	3 Short 5 Intermediate 7 Long
5.	Leaf shape (upper stem leaves)	1 Ovate 2 Oblong 3 Lanceolate 4 Linear
6.	Leaf margin	1 Entire 2 Serrate or dentate 3 Deeply serrate
7.	Extent of leaf spininess	0 Non-spiny 3 Few spines 5 Intermediate 7 Many spines
8.	OIB width	1 Narrow 2 Intermediate 3 Wide
9.	OIB length	1 Short 2 Intermediate 3 Long
10.	Number of spines on OIB	0 None 3 Few 5 Intermediate 7 Many
11.	Location of spines on OIB	0 None 1 Tip only 2 Tip and few apical 3 Tip and few basal 4 Tip and all along margins 5 Margins only
12.	Days to 50% flowering	
13.	Corolla colour in bloom	1White 2 Pale yellow 3 Light yellow 4 Yellow

		5 Light orange base 6 Yellow, base and tips of lobes orange 7 Red-Orange 8 Pink 9 Purple 10 Other
14.	Corolla colour of dry flower	1 Grey-white 2 Pale yellow 3 Yellow 4 Light orange 5 Orange base 6 Orange 7 Deep red 8 Other
15.	Pollen production	3 Sparse 5 Intermediate 7 Abundant
16.	Pollen colour	1 White 2 Yellow
17.	Head (capitulum) shape (of primary capitula before flowering)	1 Conical 2 Oval 3 Flattened
18.	Head (capitulum) number/plant	
19.	Diameter of primary head (cm)	
20.	Days to physiological maturity	
21.	Uniformity of maturation	1 Uniform 2 Varying
22.	Plant height (cm)	
23.	Seed shattering at harvest	1 Non shattering 3 Low shattering 5 Intermediate 7 High shattering
24.	Seed number/primary head	
25.	Seed colour	1 White 2 Cream 3 Brown 4 Black 5 Grey 6 Other
26.	Seed size	3 Small 5 Intermediate 7 Large
27.	Seed shape	1 Oval 2 Conical 3 Crescent
28.	Pappus in seed	0 Absent + Present
29.	Yield per plant (g) [based on plot yield]	

30.	100-seed weight (g)	
31. **	Oil content (%)	

*recorded only at Solapur
**data to be recorded at Solapur

Technical programme 2016-17

- Multiplication of accessions with less seed material
- Characterisation and evaluation of accessions with incomplete data sets
- Confirmation of promising accessions identified
- Characterisation, evaluation and multiplication of fresh accessions from National Gene Bank, NBPGR, New Delhi