

2010

RPF I

PROFORMA FOR SUBMISSION OF RESEARCH PROJECTS

PART -1 : GENERAL INFORMATION

200	Project code	
2001	Institute Project Code No.	IGFRI CI 3.10
2002	ICAR Project Code No.	
201	Name of Institute and Division	
2011	Name & Address of Institute	Indian Grassland and Fodder Research Institute Jhansi - 284003 India
2012	Name of Division/section	Crop Improvement Division
2013	Location of Project	IGFRI, Jhansi
202	Project Title	Genetic improvement of Berseem for root rot resistance, late maturity and biomass.
203	Priority area	Genetic improvement of forage crops
2031	Research Approach	Applied Research Basic Research Process /or technology Development Transfer of Technology
		01 02 03 04
		01, 02 and 03
204	Specific area	Forage crop improvement
205	Duration of Project	
2051	Date of start	2010
2052	Date of completion	2015
206	Total cost /expenditure incurred	Not applicable
2061	Foreign Exchange component (if any)	No
207	Project profile summary	Please see annexure.
208	Key words	Genetic improvement, <i>Trifolium alexandrinum</i> , interspecific hybridization, yield, fodder crops, gene introgression, germplasm

ITMU/99
05/08/2010

Part - II: Investigator Profile

210	Principal investigator	(after two year Dr. Mridul Chakraborti will be PI)
2101	Name	Dr. D. R. Malaviya
2102	Designation	Principal Scientist
2103	Division/section	Seed Technology Division
2104	Location	Jhansi
2105	Institute Address	IGFRI Jhansi – 284003
211	Co-investigator	
2111	Name	Dr. A. K. Roy
2112	Designation	Principal Scientist
2113	Division/section	GSM Division
2114	Location	Jhansi
2115	Institute Address	IGFRI Jhansi – 284003
212	Co-investigator	
2121	Name	Dr. Mridul Chakraborti
2122	Designation	Scientist
2123	Division/section	Crop Improvement Division
2124	Location	Jhansi
2125	Institute Address	IGFRI Jhansi – 284003
213	Co-investigator	
2131	Name	Sri. R. B. Bhaskar
2132	Designation	Sr Scientist
2133	Division/section	Crop Improvement Division
2134	Location	Jhansi
2135	Institute Address	IGFRI Jhansi – 284003

Part - III : Technical Details

220 Introduction and objectives:

2201 Origin of the project: (Problem identification)

Berseem is one of the most important winter season fodder crop grown in about 2 m ha area. The crop is reported to highly susceptible to disease as root rot and stem rot which a complex of more than one causal organism. Resistance sources are available only across the species. Narrow genetic base is another impediment in improvement of this crop for this trait as well as the other desirable traits such as extending vegetative growth period and increasing yield. Efforts have been made to standardize the protocol for development of interspecific hybrid using embryo rescue because as such the incompatibility barrier exists at post fertilization stage. In the process five hybrids have been developed. Hence, there is need to evaluate the segregating population of these hybrids and also to develop more hybrids.

2202 Definition of the project:

The work aims at evaluation of three interspecific hybrids developed at this institute for root rot resistance, late maturity and biomass. Further efforts will be made to develop hybrids, evaluate segregating population for various traits,

Advancement of generation of existing interspecific hybrids	Evaluation of progenies for desirable traits	Evaluation of progenies for desirable traits	Evaluation of progenies for desirable traits	Evaluation of progenies for desirable traits	Evaluation of progenies for desirable traits
Identification of resistant/tolerant hybrids/segregating population	Identification of tolerant/resistant types, late types and high yielding types	Identification of tolerant/resistant types, late types and high yielding types	Identification of tolerant/resistant types, late types and high yielding types	Identification of tolerant/resistant types, late types and high yielding types	Identification of tolerant/resistant types, late types and high yielding types
Evaluation trial progenies	Station trial of progenies	Station trial of progenies	Station trial of progenies	Station trial of progenies	Station trial of progenies
Screening for disease resistance	Screening under field condition	Screening under field and control condition	Screening under field and control condition	Screening under field condition	Screening under field condition
Characterization of RIL and NIL	Morphological characterization of existing ISH in advance generation	Morphological characterization of existing ISH in advance generation	Morphological characterization of new ISH in advance generation	Morphological characterization of new ISH in advance generation	Morphological characterization of new ISH in advance generation
Molecular studies with relation to species relationship, regeneration and	Molecular analysis of species and segregating population	Molecular analysis of species and segregating population	Molecular analysis of species and segregating population	Molecular analysis of species and segregating population	Data analysis and compilation
Genetic studies on multifoliate leaf formation.	Attempt intervarietal crossing	Attempt intervarietal crossing. Study on segregating population.	Study on segregating population.	Study on segregating population.	Data analysis and compilation
Report writing	-	-	-	-	Data analysis and report writing

2216: Estimated man-months: 65 man-months

222 Proposed Research details:

2221 Importance of the Proposed Project (gaps in knowledge/products/process technology) to the institute mandate.

Development of high yielding varieties of forage crops is the mandate of the division and the institute. The crop is widely accepted among farmers as winter season forage because of its multicut nature, high productivity and quality. Occurrence and root rot and stem rot are seriously threatening the popularity of the crop. Further, farmers feel that if the vegetative period of the crop can be extended for some more weeks particularly in central India, the availability of green fodder will increase the milk production during summer. The multifoliate berseem will be a line with increased photosynthetic area and in turn may result is high yielding variety.

2222 Questions attempted to be answered.

Transfer of desirable traits like disease resistance and extended growth period in the

present day cultivars of berseem.
 Developing immortal population advanced molecular studies.
 Developing and understanding multifoliate/pentafoliate berseem.

2223 Anticipated process/products/Technology/ Knowledge Expected to be evolved by pursuing the project:

Lines developed with:

- disease resistance
- extended growth period
- high biomass yield.

2224 Practical Utility of anticipated Results of the project:

a. Immediate benefits:

Lines with disease root rot resistance, late maturity and biomass will be developed.

b. Medium term benefits:

Varieties with disease resistance, extended growth period and high biomass will be developed.

c. Long term benefits:

Will increase the area under Berseem cultivation and increase in per unit area production. Basic information generated will be used by breeders in future.

2225. Expertise available with investigatory group/institute.

2226. Expertise (if any) to be obtained by investigatory group out side the institute.

- a. **within country** : At IGFRI the investigating group possesses the required minimum expertise.
- b. **outside country** : Outside country the work on *Trifolium* is being done in UK, Egypt, Turkey, USA and Israel.

Part - IV : BUDGET ESTIMATES

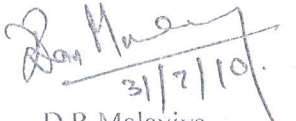
(Summary)

230 Budget summary (recurring): (in lakh)

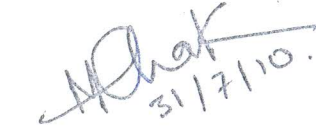
	Year1.	Year2.	Year3.	Year4.	Year5.
2301 Salaries:					
(i) Scientific	1.0	1.0	1.0	1.0	1.0
(ii) Technical	0.2	0.2	0.2	0.2	0.2
(iii) Supporting	0.1	0.1	0.1	0.1	0.1
(iv) Wages	0.2	0.2	0.2	0.2	0.2
Sub Total	1.5	1.5	1.5	1.5	1.5
2302 Consumables:					
(i) Chemicals	2.0	2.0	2.0	2.0	1.0
(ii) Computers	0.5	0.5	0.5	0.5	0.0
(iii) Others	-	-	-	-	-
Sub Total	2.5	2.5	2.5	2.5	1.0

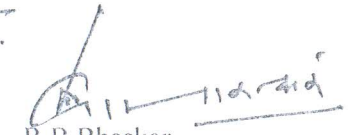
the work already done or being carried out in the institute project.

- The same project has been / has not been submitted to any other agency for financial support
- The investigator/co-investigator have been fully consulted in the development of project and have fully undertaken the responsibility to carry out the programme as per the technical programme.


31/7/10.
D.R. Malaviya
Principal Investigator

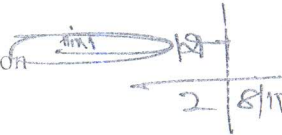

A.K. Roy
Co-investigator


31/7/10.
M. Chakraborti
Co-investigator


R.B. Bhaskar
Co investigator

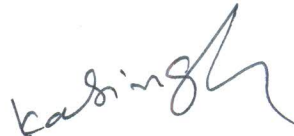
Project proposal is as per IRE decision

Signature & Comments of the Head of the Division /section


2/8/10

Forwarded
Sanjay Kumar
05.08.10

Signature & Comments of the Director



PMER.

207:Project Profile Summary

Berseem is one of the most important winter season fodder crop grown in about 2 m ha area. The crop is reported to highly susceptible to disease as root rot and stem rot which a complex of more than one causal organism. Resistance sources are available only across the species. Narrow genetic base is another impediment in improvement of this crop for this trait as well as the other desirable traits such as extending vegetative growth period and increasing yield. Efforts have been made standardize the protocol for development of interspecific hybrid using embryo rescue because as such the incompatibility barrier exists at post fertilization stage. In the process five hybrids have been developed. Hence, there is need to evaluated the segregating population of theses hybrids and also to develop more hybrids.

The work aims at evaluation of three interspecific hybrids developed at this institute for root rot resistance, late maturity and biomass. Further efforts will be made to develop hybrids, evaluated segregating population for various traits, develop RIL and NIL. Efforts will also be made to understand the genetics of mutifoliate trait. Project has been formulated with following Immediate objectives:

- Evaluation segregating population of interspecific/ intervarietal hybrids.
- Development of interspecific/ intervarietal hybrids and its evaluation.
- Characterization for intraspecific incompatibility
- Characterization of RIL and NIL in process of development
- Basic studies with relation to species relationship, regeneration and multifoliate leaf formation.