



RPF I

PROFORMA FOR SUBMISSION OF ANNUAL PROGRESS REPORT OF RESEARCH PROJECTS

Part-I: General Information

- 200 Project Code : CI 8.25
2001 Institute Code No. :
2002 ICAR Code no. :
- 201 Name of Institute and Division :
2011 Name & Address of Institute : IGFRI, Jhansi-284003
2012 Name of Division/Section : Crop Improvement Division
2013 Location of Project : Jhansi

Project Title: CI: Management of nematodes and fungal pathogens associated with root rot complex of Cowpea.

- 203 Priority Area:
2031 Research Approach. :

Applied res.	Basic Res.	Process/Technology Development	Transfer of Technology
01	02	03	04

APPLIED & BASIC RESEARCH

- 204 Specific Area: *Pest Management*
- 205 Duration
2051 Date of start : 2011
- 2052 Likely date of completion: 2014
- 206 Total cost of the Project:
- 2061 Foreign Exchange component (if any): NIL
- 207 Project profile summary:
208 Key words: *Nematodes, Fungi, Root Rot complex, Cowpea.*

ITMV

Forwarded for na please.
h/s 7/20/12/11

Part - II: Investigator Profile

210 Principal Investigator:

2101 Name : M.I. AZMI
2102 Designation : Pr. Scientist
2103 Division : Crop Improvement Division
2104 Location : Jhansi
2105 Institute : IGFRI, Jhansi - 284003

211 Co-investigator:

2111 Name : R.B. Bhaskar
2112 Designation : Sr. Scientist
2113 Division : Crop Improvement Division
2114 Location : Jhansi
2115 Institute : IGFRI, Jhansi - 284003

212 Co- investigator:

2121 Name :
2122 Designation :
2123 Division :
2124 Location :
2125 Institute :

Part - III: Technical Details

220 Introduction and objectives:

2201 Origin of the project: (Problem identification) Cowpea is an important crop and suffers serious incidences of root rot caused by *Rizoctonia sp.* association of nematodes enhances the disease severity (Powell, 1971). therefore management of fungal pathogens and nematodes together is at most required. In the present project proposal similar has been proposed.

2202 Definition of the project: The present project is proposed to evolve safe and eco-friendly sound management practices for the root-rot nematode disease complex in Cowpea.

2203 Immediate objectives:

- To develop eco-friendly management for root rot nematode complex in cowpea.
- To evaluate botanicals for management root rot nematode complex of cowpea caused by nematode and fungi.

2204 Long term objectives: Annexure I

2205 View of status of research in the subject:

International status:

Annexure I

National status:

Annexure I

221 Project Technical Profile:

2211 Organization of work element (for each objective and participating investigator giving man-months involved)

✓ **2212: Methodology:**

- Conduction of experiment.
- Nematode estimation.
- Disease incidence scoring.
- Processing of data.

2213: Plan of action:

All the activities will be continued for three years.

2214: Time schedule for activities (milestones)

Activities	1yr.	2yr	3yr.
➤ Conduction of experiment.	√	√	√
➤ Nematode estimation	√	√	√
➤ Disease incidence scoring	√	√	√
➤ Processing of data.	√	√	√

2215: Annual Targets for each activity:

All the activities mentioned will be carried out for all the three years.

2216: Estimated man-months:

Scientific - 42 Months
Technical - 06 Month
Supporting - 03 Month

222 Proposed Research details:

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

The findings of the present work will lead to the management of root rot nematode complex of Cowpea.

Questions attempted to be answered.

In view of organic farming non chemical pest and disease management through the use of botanicals is the need of the hours.

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

To develop an eco-friendly nematode an root rot management package for sustained fodder production in cowpea eco system.

2224 Practical Utility of anticipated Results of the project:

Immediate benefits:

- To achieve optimum forage yield with non chemical means of disease management in the existing agro-eco- system.
- To reduce the pressure of synthetic pesticide on the crop.

Medium term benefits:

Similar may be tested for other crops.

Long term benefits:

Findings of the present project will evolve environmentally safe alternative for the management of nematode and root rot complex of Cowpea.

2225. Expertise available with investigatory group/institute.

Nematode	M.I. Azmi
Fungi	R.B. Bhasar

2226. Expertise (if any) to be obtained by investigatory group outside the Institute.

within country	Not required
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outside country	Not required
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Part - IV: BUDGET ESTIMATES

(Summary)

230 Budget summaries (recurring):

	Year1.	Year2.	Year3.	TOTAL
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2301 Salaries:

- (i) Scientific
- (ii) Technical
- (iii) Supporting
- (iv) Wages

Sub Total

2302 Consumables:

- (i) Chemicals
- (ii) Glassware
- (iii) Others
- Sub Total

2303 Travel

2304 Miscellaneous (Other costs):

2305 Sub Total: (Recurring)

231 Non-Recurring (Equipments)

232 Totals (230 and 231)

233 Salaries /wages

Year1. Year2. Year3. Year4. Year5.

Designation with Pay scale:

- 1.
- 2.
- 3.
- 4.

Justification (for technical/wages/labour) in terms of work content:

Consumables:

Item:	Year1.	Year2.	Year3.	Year4.	Year5.
1.					
2.					
3.					
4.					

2341. Justification.

Travel

Year1. Year2. Year3. Year4. Year5.

2351.	Justification Other costs	Year1.	Year2.	Year3.	Year4.	Year5.
2361	Field preparation/planting/harvesting (man days/cost)					
2362	Intercultivation & dressing (man days/cost)					
2363	Animal maintenance					
2364	Any other item					
2365	Justification of above					
237	Equipments:					
2371	Equipments already available to be used in the project with cost:					
2372	Equipments to be purchased with cost (already in plan document)					
2373	Justification for each additional equipment					
2374	Equipment to be imported					
2375	Justification for import					
238	Additional infrastructure facilities (if needed)					
239	Financing organization					

Part V: DECLARATION

This is to certify that:

The research work proposed in the scheme/project does not in any way duplicate 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 has been fully consulted in the development of project and has fully undertaken the responsibility to carry out the programmed as per the technical programme.

1. Signature of the Project Investigator:

(M.I. Azmi)

M.I. Azmi
15/12/11

2. Signature of the Co-investigators:

(R.B. Bhaskar)

R.B. Bhaskar
15/12/11

Signature & Comments of the Head of the Division /section

P *h*
19/12/11

Signature & Comments of the Director

S. S. S.
27/12/11

ANNEXTURE-I

MANAGEMENT OF NEMATODES AND FUNGAL PATHOGENS ASSOCIATED WITH ROOT ROT OF COWPEA

Cowpea is an important crop and suffers serious incidences of root rot caused by *Rizoctonia sp.* association of nematodes enhances the disease severity (Powell, 1971). Therefore management of fungal pathogens and nematodes together is at most required. In the present project proposal similar has been proposed.

Objective:

- To develop eco friendly management for root rot complex in cowpea.
- To evaluate botanicals for management root rot complex of cowpea caused by nematode and fungi.

View of status of research in the subject:

The management strategies have been tried in several ways, chemicals (nemagan is banned, systemic pesticides have residual problems), biological (agents have ecological setting problems) and soil amendments (requires use in large quantity). Several botanical pesticides have already been tried in various crops by several workers.

International status:

Addition of leaf powder of *Asparagus sprengeri*, *Eucalyptus sp.*, *Psidium guava* @5.0 g/pot significantly reduced *Rotylenchus reniformis* of sunflower (El-Nagar et al. 199). Kamrin (1997) in his book gave an overview of general description and pesticides classes which covers phrethroids botanicals. Zalon et al., (2001) reported that botanicals are safer IPM of pest and disease specially for root knot nematode *Meloidogyne incognita* on tomato. Agbenin et al.,(2005) found 20% concentration of leaf extract of neem, *Borrelia sp.* groundnut leaf and garlic bulb were lethal to root knot nematode *M. incognita* in tomato.

National status:

Dried material of *Argemone mexicana*, *Eucalyptus globulus*, *Datura metel*, *Phyllanthus niruri* and *Shorea robusta* @ 1, 2 and 3% w/w reduced

M. incognita in tomato, Goswami and Vijayalakshmi (1986). Caster leaf reduced nematode, *M. javanica* infestation and increased 164.73% tomato yield (Dutt & Bhatti, 1986; Zaki & Bhatti, 1990). Seed coating with neem seed kernel @20% w/w reduced 40% to 75% root-knot galls of *M. incognita* in chickpea seed coating with leaves and flowers of *Colotropis gigantean* @5% w/w significantly reduced the number of root-knot galls in mungbean (Mojumder & Mishra, 1994 & 1996). The use of various plant extract in nematode management are discussed (Mishra & Dwivedi, 1998) Neem leaf @ 80g/pot reduces root-knot infestations in okra, (Ramakrishnan et al. 1997). Neem derivatives have been found toxic to root knot nematode *M. incognita* on tomato. (Byomokush Das & Padhi. 1998; Devkumar et al. 1985; Siddiqui & alam, 1985). Coating of pigeonpea seeds with powder neem seed kernel and Achook significantly reduced the penetration of nematode *Heterodera cajani* larvae (Mojumder & Mishra, 2001). Population of *Rotylenchus reniformis* significantly reduced by aqueous acetone extract of leaf and roots of *Calotropis procera*, *Solenum surattense*, *Datura stramonium* and *Parthenium hytyrophorus* (Sunaina Singh & Parasad, 2010, 2010a).

Institute status:

Root rot nematode diseases were managed by using neem seed powder @5% seed dressing in berseem (Bhaskar et al. 2003). In lucern integrated pest management was achieved by using 3% neem kernel extract (Hasan et al. 2003). In forage crop use of neem kernel extract @3% was effective to control the disease, pest and nematode (Pandey et al. 2004). Caster seed powder @10% caster leaf and Eucalyptus leaf powder @20% seed treatment were effective to control root rot nematode disease complex (Azmi et al. 2011).

Previous results of our projects showed encouraging response of caster followed by other plant parts like neem, Eucalyptus in the management of nematode root rot complex in berseem. Therefore the present project is proposed for root rot and nematode management in cowpea through botanicals.

References

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TECHNICAL PROGRAMME 2011-12

Treatments :

- 1- Carbofuran @ 1 g ai/kg + Bavistin @ 2 g/kg
- 2- Neem seed powder @ 5% w/w
- 3- Castor seed powder @ 5% w/w
- 4- Castor seed powder @ 10% w/w
- 5- Neem leaf powder @ 10% w/w
- 6- Neem leaf powder @ 20% w/w
- 7- Castor leaf powder @ 10% w/w
- 8- Castor leaf powder @ 20% w/w
- 9- Eucalyptus leaf powder @ 10% w/w
- 10- Eucalyptus leaf powder @ 20% w/w
- 11-Untreated check

Plot size	4 X 5 m ²
Variety of Cowpea	BL-2
Experiment Design	RBD
Replications	3

Observations:

- > Nematode incidence
- > Disease incidence
- > GFY and DFY