

Workplan for 2013-2017

Addressing Phytophthora Blight Disease: An Emerging Threat to Pigeonpea Expansion and Production

**Submitted to
National Food Security Mission, Government of India**

Project Partners

International Crops Research Institute for the Semi-Arid Tropics
Punjab Agricultural University (PAU), Ludhiana
Banaras Hindu University (BHU), Varanasi
RAK College of Agriculture (RAKCA)



**International Crops Research Institute
for the Semi-Arid Tropics**

This work
will be undertaken
as part of the



RESEARCH
PROGRAM ON
GrainLegumes

NFSM Funded Project: Addressing Phytophthora Blight Disease: An Emerging Threat to Pigeonpea Expansion and Production

Logical time frame illustrating the involvement of partners in different activities associated in the NFSM-funded project

Major Activities	Year/Institute involved															
	Year-1 2013-14				Year-2 2014-15				Year-3 2015-16				Year-4 2016-17			
	ICRISAT	PAU	BHU	RAKCA	ICRISAT	PAU	BHU	RAKCA	ICRISAT	PAU	BHU	RAKCA	ICRISAT	PAU	BHU	RAKCA
Project planning, review & implementation meeting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Survey for PB occurrence & distribution	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Study etiology & biology of pathogen	X	X	X	X	X	X	X	X								
Variability study of PB pathogen					X				X							
Standardization of greenhouse & field screening techniques	X				X	X	X	X	X	X	X	X				
Screening of pigeonpea released/advanced germplasm & breeding lines	X				X	X	X	X	X	X	X	X	X	X	X	X
Confirmation of PB resistant/ tolerant lines					X	X	X	X	X	X	X	X	X	X	X	X
Multi-location evaluation of PB resistant/ tolerant lines					X	X	X	X	X	X	X	X	X	X	X	X
Training of NARS scientist in PB resistance screening					X											
Seed multiplication of PB resistant/ tolerant lines					X	X	X	X	X	X	X	X	X	X	X	X
On-farm validation of PB resistant/ tolerant lines													X	X	X	X
Summarize & share results	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Detailed activity wise work plan

Details of activity wise work plan elaborating the involvement of partners in different activities associated in the NFSM funded project entitled “**Addressing Phytophthora Blight Disease: An Emerging Threat to Pigeonpea Production and Expansion**”

Year	Activity	Strategy	Centre involved
Year-1 2013-14	<ul style="list-style-type: none"> • Project planning and implementation meeting. • Procurement of equipments • Recruitment of Special Project Scientist, RA and SRF • Survey of major pigeonpea growing areas • Etiology and biology of PB pathogen -<i>Phytophthora drechsleri</i> f. sp. <i>cajani</i> • Standardization of greenhouse screening protocols 	<ul style="list-style-type: none"> • Discussion and finalization of year-1 activities • As per budget allocated to each center in the approved proposal • Each center will purchase the equipment themselves • As per approval and ICAR norms • GPS based survey will be conducted in major pigeonpea growing states: Maharashtra, Karnataka, Andhra Pradesh, Uttar Pradesh, Punjab, Madhya Pradesh and Chhattisgarh etc. • Isolation, Purification and Pathogenicity • Identification of causal organism- ITS based • Characterization to understand variability i.e. zoospore, sporangia, oospore, oogonia production and shape. • Identification of components for PB resistance screening technique such as: Optimum Temperature, Relative Humidity, Inoculum load, Soil moisture, Plant age, Soil type, and Susceptible cultivar 	<p>ICRISAT (organizing center) BHU, PAU, RAKCA (partners)</p> <p>ICRISAT, BHU, PAU, RAKCA</p> <p>ICRISAT: SPS, RA PAU: SRF BHU: SRF RAKCA: SRF</p> <p>ICRISAT: AP, MH, KA BHU: UP PAU: Punjab RAKCA: MP & CG</p> <p>Studies will be conducted by each center with the respective isolate of their location</p> <p>All centers will conduct study with the respective isolate of their location</p>

Year	Activity	Strategy	Centre involved
	<ul style="list-style-type: none"> Screening of pigeonpea released cultivars for PB resistance. Half yearly progress report 	<ul style="list-style-type: none"> Evaluation of different methods for standardization of greenhouse screening techniques such as: Soil drench, Sick soil, Root dip, Spray inoculation, Stem rubbing Set of all the wilt and SMD resistant, released cultivars of pigeonpea will be selected Screening of all the released cultivars in greenhouse Selection of all the region/location specific improved cultivars Compilation of data from each centre 	<p>ICRISAT will standardize the PB screening technique and share protocol with partners</p> <p>ICRISAT</p> <p>ICRISAT</p> <p>BHU, PAU, RAKCA</p> <p>All partners</p>
Year-2 2014-15	<ul style="list-style-type: none"> Annual review and planning meeting. Confirmation of PB resistant lines from released cultivars Standardization of field screening technique Evaluation of AICRP-PP wilt and SMD donor lines, location specific and advance breeding lines Evaluation of germplasm collection Seed multiplication of PB resistant/ tolerant lines Evaluation PB tolerant lines at Multi-location 	<ul style="list-style-type: none"> Review of year-1 work, and planning, finalization for year-2 Screening of PB resistant lines with respective isolate from each location in green house Development of PB sick plot Screening in natural epiphytic conditions Screening in PB sick plot Screening in greenhouse Screening in greenhouse In field at each location Screening under natural epiphytic conditions at hot spot locations for PB: ICRISAT, Varanasi, Sehore, Ludhiana, Bharuch, Bangalore, Badnapur 	<p>At partner location</p> <p>ICRISAT, BHU, PAU, RAKCA</p> <p>ICRISAT</p> <p>PAU, BHU RAKCA, ICRISAT ICRISAT</p> <p>ICRISAT</p> <p>ICRISAT, BHU, PAU, RAKCA</p> <p>ICRISAT : Conduct trials in selected locations in AP, Gujarat, Karnataka, and Maharashtra</p>

Year	Activity	Strategy	Centre involved
	<ul style="list-style-type: none"> Variability studies on PB pathogen <i>Phytophthora drechsleri</i> f. sp. <i>cajani</i> to determine pathotype scenario Training of NARS Scientists in resistant screening technique Half yearly and annual progress reports 	<ul style="list-style-type: none"> Studies on cultural, morphological, pathological and molecular characters will be conducted Demonstration/ Hands on training on screening procedure of PB and selection of resistance Compilation of data from each center 	BHU- Varanasi RAKCA- Sehore PAU- Ludhiana ICRISAT ICRISAT ICRISAT, BHU, PAU, RAKCA
Year -3 2015-16	<ul style="list-style-type: none"> Annual review and planning meeting. Confirmation of resistance with the location specific isolate in greenhouse Evaluation of PB resistant/ tolerant lines Selected set of PB resistant/ tolerant lines evaluated at multi-location for stability of resistance Seed multiplication of PB resistant/ tolerant of most promising lines Half yearly and annual progress reports 	<ul style="list-style-type: none"> Review of year-2 work and planning, finalization of year-3 activities Screening of PB resistant/ tolerant lines using standardized field screening technique Screening of PB resistant/ tolerant lines in greenhouse Multi-location evaluation in hot spot locations where PB occurrence is frequently reported At each location Compilation of data from each center 	At partner location ICRISAT, BHU, PAU, RAKCA All partners ICRISAT- Andhra Pradesh, Maharashtra, Karnataka, Gujarat BHU- UP RAKCA- MP &CG PAU- Punjab ICRISAT, BHU, PAU, RAKCA ICRISAT, BHU, PAU, RAKCA
Year -4 2016-17	<ul style="list-style-type: none"> Annual review and planning meeting 	<ul style="list-style-type: none"> Review of year-3 work and planning, finalization of year-4 activities 	At partner location

Year	Activity	Strategy	Centre involved
	<ul style="list-style-type: none"> • Screening confirmation of PB resistant/ tolerant lines for one more year 	<ul style="list-style-type: none"> • Screening at all locations in field 	ICRISAT, BHU, PAU, RAKCA
	<ul style="list-style-type: none"> • On-farm validation of PB resistant/tolerant lines 	<ul style="list-style-type: none"> • Evaluation in farmers field at different locations 	ICRISAT- Andhra Pradesh, Maharashtra, Karnataka, Gujarat PAU- Punjab BHU- Uttar Pradesh RAKCA- MP & CG
	<ul style="list-style-type: none"> • Seed multiplication for on-farm evaluation 	<ul style="list-style-type: none"> • At each location 	ICRISAT, BHU, PAU, RAKCA
	<ul style="list-style-type: none"> • Sharing knowledge on PB disease with NARS partners 	<ul style="list-style-type: none"> • Through publications, as research articles and Information Bulletin • PB resistant donor lines introduced in AICRP-PP program 	ICRISAT and partners ICRISAT
	<ul style="list-style-type: none"> • Half year and Annual progress report 	<ul style="list-style-type: none"> • Compilation of data from each center 	ICRISAT
	<ul style="list-style-type: none"> • Summarization of 4 years work 	<ul style="list-style-type: none"> • Compilation of 4 years data and preparation of consolidated progress report 	ICRISAT