

JOINT RESEARCH AGREEMENT

between the

Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh

and the

Japan International Research Center for Agricultural Sciences (JIRCAS), Japan

for Collaboration in

“Investigation of pathogenic variation of Asian soybean rust pathogen and development of resistant soybean varieties in Bangladesh”

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This document is made on the basis of an agreement entered into and executed by the Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh (hereinafter referred to as “BSMRAU”) and the Japan International Research Center for Agricultural Sciences (hereinafter referred to as “JIRCAS”), Japan (hereinafter jointly referred to as Parties).

To facilitate and harmonize the collaboration between BSMRAU and JIRCAS, the Parties have reached mutual understanding as set forth in the following conditions.

Article 1. Nature of Collaboration

- 1.1 The collaboration between the Parties shall be in the planning and implementation of a predetermined and mutually agreed upon research project.
- 1.2 The Parties have agreed to cooperate in the research on “Investigation of pathogenic variation of Asian soybean rust pathogen and development of resistant soybean varieties in Bangladesh” (hereinafter referred to as “Project”).
- 1.3 When there is a need for other forms of collaboration, these will be discussed, agreed upon and implemented by the Parties.

Article 2. Project Work Plans

- 2.1 This Joint Research Agreement (hereinafter referred to as “Agreement”) shall be supplemented by a separate work plan for the Project (Appendix 1).
- 2.2 The Work Plan shall specify the details of the research plan including subjects, objectives, scope, methodologies, time schedule and other elements necessary for implementing the Project.
- 2.3 With the consent of the Parties, the Work Plan may be modified in the course of the Project duration.
- 2.4 Additional plans and suggestions for the Project may originate from each of the Parties but will require the approval of the other Party for implementation.
- 2.5 Recognizing that, in order to successfully and fully attain the goals of the Project

covered by this Agreement, cooperation and development of partnership with third parties would be appropriate and indispensable, the Parties may, by mutual consent, allow a third party to participate in its implementation following the conditions set forth in the said Agreement.

Article 3. Effective Term of Agreement

The duration of the Project is from the date of signing of the Agreement to March 31, 2021.

Article 4. General Contributions

4.1 BSMRAU and JIRCAS will, subject to personnel and budgetary limitations and as may be mutually agreed upon, provide the following inputs:

4.1.1 Laboratories and related facilities required for the Project;

4.1.2 Scientific and support staff required for the Project;

4.1.3 Assistance to BSMRAU or JIRCAS scientist(s) in meeting the formalities prescribed by government authorities for granting of visa(s)

Article 5. Results/Publications/Intellectual Property Rights

5.1 Research results and materials developed in this Project will be considered as the joint property of BSMRAU and JIRCAS and will be subject to the intellectual property rights policy of BSMRAU and the relevant intellectual property rights policy of JIRCAS.

5.2 Research results may be used by either or both Parties, with due recognition of each party's contribution.

5.3 Research findings will be published in the public interest if mutually agreed upon.

5.4 Publications may be joint or separate as determined in each case. In case of any failure to agree on the method of publication or interpretation of results, except annual reports, the Party desirous of publishing the findings separately may do so after having considered comments and suggestions offered by the other Party.

5.5 Either Party publishing any research findings will give credit to the other Party's contribution but shall, at the same time, be entirely responsible for the conclusions and interpretations reported.

5.6 In such case that the Parties agree to make patent application of the obtained results, the Parties shall negotiate and shall have a separate agreement, regarding sharing of the rights, application, registration and maintenance costs of the patent.

5.7 Either Party may use any research materials or genetic resources of the other Party for the Project under a Material Transfer Agreement (MTA) concluded separately between BSMRAU and JIRCAS.

5.8 Any confidential information, including personal data, which may be disclosed to one

Party to the other, or which may be developed by both Parties jointly under this Agreement, should be kept confidential by all Parties.

Article 6. Final Report

BSMRAU and JIRCAS shall prepare a final report describing all the obtained results immediately after completion of the collaboration or upon termination of this Agreement.

Article 7. Discussion

If any matter arises, for which this Agreement has no provisions, or any doubtful issue in respect of the performance of this Agreement, BSMRAU and JIRCAS shall hold discussions to amicably settle it.

Article 8. Modifications and Termination of Agreement

8.1 The Parties of this Agreement may, by mutual consent, add, modify, amend, or delete any words, phrases, sentences or provisions in this Agreement.

8.2 The Agreement shall remain in full force and effect for the duration specified in Article 3 unless terminated by mutual consent of the Parties, provided that at least a six-month prior notice by either Party shall have been issued.

8.3 After completion of the Project or termination of this Agreement, each clause described in Article 5 shall remain in effect for further three years, unless otherwise discussed and agreed upon by the Parties. Any personal data shall not be disclosed for an indefinite duration.

IN WITNESS WHEREOF, the Parties have signed this document on the date and in the place indicated below.

For the
Bangabandhu Sheikh Mujibur Rahman
Agricultural University

For the
Japan International Research Center
for Agricultural Sciences

By Prof. Dr. Md. Khurshed Alam Bhuiyan
Department Head
Department of Plant Pathology

By Dr. Kazuo Nakashima
Program Director
Program on Stable Food Production

Date: _____

Date: _____

Place: _____

Place: _____

Work Plan

“Investigation of pathogenic variation of Asian soybean rust pathogen and development of resistant soybean varieties in Bangladesh”

Background

Soybean, one of the four major economic crops in the world, is an important source of oil, food and animal feed. Further increases in soybean production are necessary in anticipation of the expansion of demand driven by world population growth. Asian soybean rust (ASR) is the most serious soybean disease in tropical and sub-tropical soybean producing areas around the world. Thus, JIRCAS has implemented a collaborative research project “Development of technologies for the control of migratory plant pests and transboundary diseases (JIRCAS’ Pest & Disease Control Project)” with institutes in Argentina, Paraguay, Brazil, Uruguay, Mexico, and Bangladesh to develop resistant varieties against ASR there and to evaluate the reduction of fungicides using the resistant varieties.

In Bangladesh, soybean production has intensified due to increased demand from poultry feed millers and for consumer products such as edible oil, soymilk, soy flour and whole beans, and for fortifying maize flour. The growing demand, coupled with attractive farm gate prices, has stimulated significant interest in soybean production by smallholder farmers and larger commercially-oriented growers. ASR poses particular risk as it causes massive yield losses in Bangladesh, too. However, in Bangladesh there is limited information on rust distribution, epidemiology, races of the pathogen present and management practices. Early and accurate detection of the fungus combined with prevailing wind patterns, can facilitate the mapping of ASR distribution and its risk of spread. In addition, variance of the fungus needs to be characterized in order to evaluate the races present in the region and to provide this knowledge to plant breeders to enable them to screen, develop and deploy resistant cultivars.

Objectives of the Project

This Project, entitled “Investigation of pathogenic variation of Asian soybean rust pathogen and development of resistant soybean varieties in Bangladesh,” will be implemented as a part of the JIRCAS’ Pest & Disease Control Project. The objectives of the Project are:

1. Geographic and temporal pathogenic variation of ASR collected in the soybean productive regions in Bangladesh, and
2. Development of Bangladeshi soybean cultivars with a high level of genetic resistance to the predominant races of ASR in Bangladesh.

Duration of the Project

The Project will start on the date of signing by BSMRAU and JIRCAS and will continue until March 31, 2021. The duration may be extended by mutual written agreement prior to the termination.

Participating Scientists

BSMRAU

1. Dr. Md. Motaher Hossain (Assistant Professor)

JIRCAS

1. Dr. Naoki Yamanaka (Senior Researcher)
2. Dr. Masayasu Kato (Project Leader, JIRCAS' Pest & Disease Control Project)

Roles of the Institutes and Scientists for the Project

BSMRAU

1. Sampling and evaluation of ASR populations in Bangladesh together with JIRCAS
2. Analyzing pathogenicity of ASR populations in Bangladesh together with JIRCAS
3. Backcrossing and marker-assisted selection (MAS) by using resistant breeding materials as donor parents and Bangladeshi varieties as recurrent parents, respectively

JIRCAS

1. Provision of the differential soybean varieties and *Rpp*-pyramided lines JIRCAS developed, under a Material Transfer Agreement (MTA) concluded separately
2. Provision of technological know-how for evaluation of pathogenicity of ASR
3. Sampling and evaluation of ASR populations in Bangladesh together with BSMRAU
4. Analyzing pathogenicity of ASR populations in Bangladesh together with BSMRAU
5. Development of DNA markers for MAS

Research plan (FY*2016-FY2020, 5 years)

Subject/Activity	Organization	FY2016	FY2017	FY2018	FY2019	FY2020
Transferring soybean materials to Bangladesh	JIRCAS	←→				
Sampling and evaluation of ASR populations	BSMRU and JIRCAS	←→				
Analyzing pathogenicity of ASR populations in Bangladesh	BSMRU and JIRCAS		←→			
Development of DNA markers for MAS	JIRCAS	←→				
Backcrossing and MAS	BSMRU			←→		

*FY: fiscal year starting on April 1 and ending on March 31 in the next year