

United States Department of Agriculture Extramural Agreement		Type of Research Agreement: TRUST FUND COOPERATIVE AGREEMENT	Control No. 24510
Title of Project RE-INSTATEMENT OF THE SORGHUM CONVERSION PROGRAM		Agreement Number: 58-6202-0-175	Type of Action: New
		Accession No: 418689	
		Period of Agreement: 11/01/2009 thru 10/31/2014	
Agency (Name and Address) USDA, ARS, SPA 1001 HOLLEMAN DRIVE EAST  COLLEGE STATION TX 77840		Project Number: 6202-21000-027-07T	Authority: 7 U.S.C.3318(b)
		Agreement Total: (b)(4)	Change in Agreement Total: \$0
		Accounting Distribution 093-6202-228	(Accounting Code / Amount) (b)(4)
Authorized Departmental Officer's Designated Representative (Name and Address) ROBERT R KLEIN USDA, ARS, SPARC, CGRU 2881 F&B ROAD COLLEGE STATION TX 77845		Cooperator/ Recipient/ Sponsor (Name and Address) MMR GENETICS P.O. Box 60 VID: phone: 806-267-2379; http://www.mmrgenetics.com/ VEGA TX 79092- UNITED STATES	
Finance Office (Complete Mailing Address) USDA, ARS, SPA, BFO 1001 HOLLEMAN DRIVE EAST COLLEGE STATION TX 77840		Designated Representative (Name and Address) for the above: FREDERICK R MILLER P.O. Box 60 phone: 806-267-2379; http://www.mmrgenetics.com/ VEGA TX 79092-	

This Agreement includes the following:

- Statement of Work
- Proposal
- Sponsor's Proposal
- Budget (Form REE454)
- Budget (Form REE455)

Applicable Provisions

Payment:

- HHS/ Payment Management System
- EFT/ Treasury Check
- ARS Receives Funds
- Advance Payment Authorized
- Pre-Award Costs Authorized

Applicable Provisions: Available at <http://www.afm.ars.usda.gov/agreements/partnership.htm>

- Non Assistance Coop. Agreement (7 CFR Part 550) Reporting Requirements (submit)  ADODR  Sponsoring Organization
- Research Support Agreement (REE-452R) Submit:  Performance Reports  Financial Reports  Management Reports (RSA Only)
- TFCA and RCA (7 CFR Part 550 and REE-22)  Quarterly  Quarterly  Monthly
- Grants and ATCA (REE-453)  Semi-Annual  Semi-Annual  Quarterly
- Non Funded Coop. Agreement (7 CFR Part 550 and REE-29)  Annual  Annual  Semi-Annual
- Other (Specify):  Final  Final  Final

Other (Specify):

- AD-1047 - Certification Regarding Debarment, Suspension and other Responsibility Matters - Primary Covered Transactions
- AD-1049 - Certification Regarding Drug-Free Workplace Requirements - Non-Individuals
- AD-1050 - Certification Regarding Drug-Free Workplace Requirements - Individuals
- USDA Civil Rights Poster (AD-475A)
- REE-26 - Certification Regarding Performing Organization Type
- Certification Regarding Lobbying - Contracts, Grants, Loans and Cooperative Agreements
- Attachment A - RSA Monthly Management Reporting Template
- Comments, (see page 2)
- Report of Inventions and Subcontracts via iEdison Web interface at <http://www.iEdison.gov>

For the United States Department of Agriculture:

Authorized Departmental Officer <i>MARtha Snodgrass</i>	Typed Name MARTHA T SNODGRASS	Date 11/6/09
For the Performing/ Sponsoring Organization: (Signature of persons authorized to incur contractual obligations)		
Signature <i>Larry Richardson</i>	Type Name and Title Larry Richardson President	Date 11-20-09
Signature	Type Name and Title	Date

Agreement No. 58-6202-0-175

Amendment No. 00

Cooperator: MMR GENETICS

Control No. 24510

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**Objective:**

The objective of this research is to evaluate, characterize, and utilize accessions from the world collection with an overall goal of releasing new germplasm resulting in a marked increase in hybrid grain yields. The specific objectives include the development and utilization of genotyping methodology developed by the ARS incumbent for marker-assisted selection of photoperiodism; the genetic fingerprinting of tropical accessions and photoperiod-converted materials to obtain a catalog of the regions of the tropical genomes that are critical for agronomic performance; map and identify markers linked to additional trait loci including dwarfism genes for use in marker-assisted selection; and investigate value-added traits that emerge during the conversion of tropical sorghums to temperate adaptation.

**Approach:**

Utilize molecular markers linked to photoperiod (ma) genes to selected backcross progeny during the introgression of photoperiod-insensitive alleles into tropical germplasm. Utilize Diversity Array Technology (DArT) markers arrays to fingerprint tropical accessions while fingerprinting backcross-derived lines to catalog genomic blocks that are inherited from the tropical accession or the temperate donor parent. Utilize mapping populations developed by the ARS incumbent or MMR Genetics to map additional trait loci including dwarfism genes, and utilize molecular markers linked to these traits to expedite their introgression during the conversion of tropical accessions to photoperiod-insensitive, dwarf-germplasm suitable for growers in temperate climates.

**STATEMENT OF MUTUAL INTEREST:**

Both parties are actively engaged in independent, but complementary efforts that aim to convert tropical sorghum accessions to short, early flowering cultivars suitable for U.S. agriculture. The parties agree that meeting the objectives of this project will strengthen and enhance ongoing work within the scope of this agreement. The mutual interest of the ARS and MMR Genetics is to convert tropical sorghums to temperate adaptable lines and thereby increase the grain yield performance of commercial hybrids. The ARS has an independent interest in conducting a pilot project that tests the utility of molecular technology in screening for specific traits including photoperiodism (maturity) and plant stature (dwarfing). MMR Genetics has an independent interest in converting tropical sorghums using largely classical breeding methodology including visual screening for key agronomic traits except for those traits for which the ARS will screen with molecular markers.

**THE COOPERATOR AGREES TO:**

Conduct at Sponsor facilities and elsewhere as appropriate, work directed toward accomplishing the cooperative efforts of the agreement. Such activities include:

- a. Grow tropical accession in Vega, TX, and in appropriate summer and winter nurseries.
- b. Conduct all breeding steps in conversion program including hand emasculations and cross/ self pollinations.
- c. Screen germplasm for phenotypic traits that will not be screened by the ARS with molecular markers.

**ARS AGREES TO:**

Conduct work directed toward accomplishing the cooperative efforts of this agreement. Such activities include:

- a. Screen accessions and derived breeding materials with molecular markers linked to maturity gene ma1.
- b. Screen accessions and derived breeding materials with molecular markers linked to dwarfing genes dw2 and dw3.
- c. Obtain and subsequently utilize DArT marker analyses for tropical accessions and breeding materials derived from tropical accessions.
- d. Maintain database containing molecular marker data detailed above in sections 2a-2c.

**MUTUAL AGREEMENTS:**

1. ARS receives funds.
2. See applicable Provisions on the website:  
<http://www.afm.ars.usda.gov/agreements/partnership.htm>.

Agricultural Research Service  
Agreements Information Management System  
Statement of Work

Agreement No. 58-6202-0-175

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3. Correspondence and documentation submitted by the Cooperator to the ADODR in reference to this agreement should cite Agreement No. 58-6202-0-175

4. Copies of all correspondence should be forwarded to the ADO at:

USDA, ARS, SPA  
1001 HOLLEMAN DRIVE EAST  
COLLEGE STATION TX 77840

**PERFORMING ORGANIZATION TYPE:**  
Required Information (Check one box only)

**SUB OBJECT CODE**  
(Agency Use Only)

- 1862 Land-Grant College ..... LG
- 1890 Land-Grant College ..... HB
- Cooperative Extension Service ..... CO
- Female Owned ..... FO
- Hispanic Institution ..... HI
- Individual ..... IN
- Minority Owned ..... MO
- Other ..... OT
- Other Federal Research ..... FR
- Private for Profit ..... PP
- Private Non-Profit ..... PN
- Private University or College ..... PR
- Public University or College ..... PU
- Small Business ..... SB
- State Agricultural Research Station ..... SA
- State or Local Government ..... SL
- Veterinary School or College ..... VE

The following additional information is required:

- Dunn and Bradstreet Universal Numbering System (DUNS) 021982140
- Tax Identification Number (TIN) 75-2633822  
or  
Social Security Number (SSN) - (applicable to individuals only)
- Authorized Organizational Representative E-Mail Address larry@richardsonseeds.com
- Principal Investigator E-Mail Address dr.fred@mrgenetics.com