From:	Bill Rooney
To:	"Payton, Stephanie"
Subject:	RE: FY2011 Federal Initiatives One-pager (s): High resolution pictures needed
Date:	Sunday, November 08, 2009 9:29:00 AM
Attachments:	IMG_0648.jpg DCP_5093.JPG Picture_027.jpg

Stephanie:

Here are a few pictures, although I'm not sure they are any better than what you already are using. I'll let you decide.

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

From: Payton, Stephanie [mailto:sa-payton@tamu.edu]
Sent: Friday, November 06, 2009 2:12 PM
To: Bill Rooney
Subject: FY2011 Federal Initiatives One-pager (s): High resolution pictures needed

We are in the process of formatting the one-pagers for the FY2011 Federal Initiatives booklet. Please send 3 updated high resolution pictures to me electronically by **Thursday, November 12th**. I have attached the one-pager(s) from FY2010 for your convenience to allow you to review the picture(s) used last year.

Enhancement of Dedicated Energy Sorghums through Compositional Analysis

Thank you
Stephanie

Stephanie Payton
Assistant to the Assistant Vice Chancellor
Office of Federal Relations
Texas A&M AgriLife

2259 TAMU|College Station, Texas 77843-2259
Phone: 979.845.2612|Fax: 979.845.1527
e-mail: **sa-payton@tamu.edu**
http://agofr.tamu.edu/


34
2009/07/02

From: Bill Rooney
To: "Ostilio Portillo"
Subject: RE: Greetings from Honduras.
Date: Tuesday, November 03, 2009 5:47:00 PM
Attachments: 11.03.09 Ostilio Portillo Ph.D. Offer Letter.pdf

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Ostilio:

My apologies for the delay. I was pretty much not in town for the month of October. Please find attached assistantship offer. If you have questions please let me know.

I'm going to nominate you for a Monsanto assistantship. Not sure if it'll go, but we'll see. It'll mean a few more dollars to you and less that I have to pay……

Regards,
Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

From: Ostilio Portillo [redacted]
Sent: Tuesday, November 03, 2009 4:51 PM
To: Dr. William L. Rooney
Subject: Greetings from Honduras.

Good afternoon Dr. Rooney;

I just want to drop a line to let you know that last Saturday I received a notice from the Office of Admissions and Records with respect to my application to the spring semester 2010. They informed me that I have been admitted to Texas A&M University and that I should be receiving an acceptance letter in approximately 4 weeks.

I guess this is not the letter you were talking about. I would appreciate if you could give an update of the current situation. I guess I am just a bit worry given the limited time left for any kind of paper work to be done before this year is over. If at the end it will not be possible I would also appreciate your input to adjust my personal plans accordingly. Thanks your response and take care. Ate.

Ostilio R. Portillo
Asistente del Líder del Programa de Hortalizas
Centro Experimental y Demostrativo de Horticultura (CEDEH)
Comayagua, Comayagua
Tel.: (504) 715-5189, (504) 89541590
e-mail: [redacted]

AgriLIFE RESEARCH & EXTENSION
Texas A&M System

TEXAS A&M UNIVERSITY

COLLEGE OF AGRICULTURE AND LIFE SCIENCES

Department of Soil and Crop Sciences
Academic & Student Advising Office

November 3, 2009

Mr. Ostilio Portillo
Honduras

Dear Ostilio:

I am pleased to offer you a Graduate Research Assistantship in Soil & Crop Sciences at Texas A&M University. As we discussed, the focus of your Ph.D. research remains to be confirmed, but it will involve sorghum breeding and genetics. I will serve as your committee chair. In addition to your research, you will be expected to assist in the normal tasks associated with the breeding program which include nursery planning, seed preparation, planting, pollination, harvest, threshing and computer inventory and analysis. The amount of assistance expected from each student varies, depending on the demands of his research at the time and the needs of the program. Our program will assist you in the collection of data for your thesis when it is necessary and appropriate. This will provide you with a well-rounded education and the expertise you will need when you are hired to manage a plant breeding program.

The position will begin on or after January 1, 2010, contingent upon successful completion of a state mandated criminal background check which is applicable to all new employees. Go to http://soilcrop.tamu.edu/employees.html and click on Applicant Record Check – revised (form can be found also at http://agservices.tamu.edu/forms/AG-473.pdf.) Complete the form, sign, and fax to Glenda Kurten at 979-458-0533 as soon as possible.

The compensation package will include an annual salary of **$18,000** along with employee health insurance and payment of tuition and fees associated with 9 hours of course work in each of the long semesters and 6 hours during the summer session. Half of your health insurance coverage will be in the form of additional salary that will be deducted each month. The other portion will be paid directly by the State. Note also that the state of Texas mandates a 90 day waiting period before you are covered by health insurance.

Continuation of the Assistantship will require that you maintain a 3.0 GPA and make satisfactory progress towards your thesis/dissertation research. Graduate students in Soil and Crop Sciences are expected to attend the weekly Departmental Seminars and any discipline orientated seminar/discussion groups as deemed appropriate by your Committee Chair to maintain good standing in the Department. Funds supporting this position are provided for up to three years; any extensions will be based on available funding.

Although you will be on a research assistantship, it is departmental policy that all graduate students gain some teaching experience during their graduate training. Thus, all M.S. students are expected to assist in

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AgriLIFE RESEARCH & EXTENSION
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Department of Soil and Crop Sciences
Academic & Student Advising Office

one lab (two sections) and Ph.D. students are expected to assist in two labs (two sections each) during their tenure.

It is an exciting time to be a part of the Soil and Crop Sciences Department at Texas A&M. We are a large, diverse Department representing a broad array of faculty members and students with which you can interact and collaborate. Please do not hesitate to contact me if I can assist you in any way or if you would like additional information on our program. You may also contact Wayne Smith, Associate Head for Academic Programs, at 979-845-3450 or cwsmith@tamu.edu.

Please indicate your acceptance of this offer and complete the attached form so that we can initiate the state-mandated background check. Return a copy to me and a copy to Glenda Kurten (g-kurten@tamu.edu or fax at 979-458-0533).

Best regards,

William L. Rooney
Professor
Sorghum Breeding and Genetics

I accept the terms and conditions of this offer.

_____ _____

Ostilio Portillo Date

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From: Bill Rooney
To: "Kimberly Christiansen"
Cc: "Rene Clara"
Subject: RE: INTSORMIL 2009 Request for Annual Regional Project Reports
Date: Tuesday, November 10, 2009 4:14:00 PM
Attachments: INTSORMIL Cental American Regional Report 2009.docx

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Kim:

I'm attaching a copy of the Central American regional report to you. I'm sending it now because (1) it is already late and (2) I might forget to send it tomorrow, but I would ask that you hold it until tomorrow. I'm going to try and review it tonight and make corrections. However, if you don't get anything from me tomorrow, then what you have is what it is gonna be.

Thanks for being patient. I eventually get where I need to be, but it seems that I'm always late…….

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

From: Kimberly Christiansen [mailto:kchristiansen@unlnotes.unl.edu]
Sent: Tuesday, September 15, 2009 3:34 PM
To: gejeta@purdue.edu; hamakerb@purdue.edu; g-peterson1@tamu.edu; gpeterso@ag.tamu.edu; wlr@tamu.edu; bpendleton@mail.wtamu.edu
Subject: INTSORMIL 2009 Request for Annual Regional Project Reports

Date: September 15, 2009

To: INTSORMIL Regional Coordinators

Subject: Request for Annual Regional Project Reports (September 30, 2008 – September 29, 2009)

It is once again time to submit your regional reports. **Reports are due November 2, 2009.**

Forms and guidelines are attached, but you may also access the Guidelines and Reporting Forms through the INTSORMIL web site, please go to http://intsormil.org/smformsreports.htm and you will find all the required forms available in PDF and Microsoft Word formats as applicable.

Please follow the instructions on each form. On the Degree and Non-Degree Training Forms, please provide us with complete and accurate information for each section of the form. It is crucial that you provide the individual's name and a **permanent address** for all students and trainees. Please make sure to list all conferences/workshops that you have sponsored in your region.

Please submit your report via e-mail. Graphs should be submitted as either.jpg, .bmp, or .tif format. The report should be single spaced and no more than fifteen (15) pages. If you, or your report preparer, have any questions please contact Ms. Kimberly Christiansen by phone at (402) 472-6032 or e-mail at kchristiansen2@unl.edu.

Attached forms:

Regional Report Guidelines
Degree Programs (September 30, 2008 – September 29, 2009)
Non-Degree Programs (September 30, 2008 – September 29, 2009)
Buyins (September 30, 2008 – September 29, 2009)

INTSORMIL Regional Program
Annual Regional Report Guidelines

Year 3, September 30, 2008 through September 29, 2009

CENTRAL AMERICAN REGIONAL REPORT
William L. Rooney and Rene Clara Valencia Regional Coordinators

Regional Coordinators

Ing. Rene Clara-Valencia (Central America Regional Host Coordinator), Plant Breeder CENTA (retired), Apdo. Postal 885, San Salvador, El Salvador
Dr. William L. Rooney (Central America Regional Coordinator), 2474 TAMU, Department of Soil & Crop Sciences, Texas A&M University, College Station, Texas 77843-2474

Country Coordinators

Ing Rafael Obando Solis, Agronomist, CNIA/INTA, Apdo. 1247, Managua, Nicaragua (Nicaraguan Country Coordinator)
Ing. Hector Sierra, Agronomist, DICTA, Choluteca, Honduras (Honduras Country Coordinator)

Collaborating Scientists

Ing. Humberto Salvador Zeledón, Plant Breeding/Agronomy, CENTA, San Andres, El Salvador
Dr. Máximo Antonio Hernández, Entomologist, CENTA, San Andres, El Salvador
Mario Ernesto Parada Jaco, Entomologist, CENTA, San Andres, El Salvador
Ing. Vilma Calderón, Food Scientist, CENTA, San Andres, El Salvador
Ing. Reina Flor de Serrano, Plant Pathologist, CENTA, San Andres, El Salvador
Alfredo Alarcón, Agronomy, CENTA, San Andres, El Salvador
Edgard Ascencio, Agronomy, CENTA, San Andres, El Salvador
Margarita Alvarado, Food Scientist, CENTA, San Andres, El Salvador
Rodolfo Valdivia, Agronomist, INTA/CNIA, Managua, Nicaragua
Pascual López, Agronomist, INTA/CNIA, Managua, Nicaragua
Ing. Nury Gutiérrez, Plant Breeding/Agronomy, INTA/CNIA, Managua, Nicaragua
Ms. Eliette Palacio, Food Scientist, INTA/CNIA, Managua, Nicaragua
Dr. Lloyd W. Rooney, Department of Soil & Crop Sciences, Texas A&M University, College Station, Texas 77843-2474
Dr. Joe D. Hancock, Department of Agronomy, Kansas State University, Manhattan, Kansas,

Collaborative Program (Regional Program Description)

The regional programs of the INTSORMIL program are designed to support national research program efforts to develop dynamic, competent institutional research programs which contribute to productivity, economic growth, natural resource conservation and improved nutrition of people in the region. By accessing available expertise and infrastructure in the region, support from INTSORMIL is designed to facilitate and promote interaction between national programs, NGOs, international research centers, private sector and scientists from the U.S. land grant universities to achieve the goals of improving producitivity, profitability, economic growth and food security for producers and consumers as well. Historically, the Central American Regional Program has been a robust and active program. Given the new INTSORMIL program, the Central American program is in the process of re-organization including but not limited to development of new program priorities and project development.

Institutions

Active INTSORMIL collaboration in Central America is occurring primarily among the following institutions: Centro Nacional de Technologla de Agropecuaria y Forestal (CENTA), El Salvador; Instituto Nicaraguense de Tecnologia Agropecuaria (INTA), Nicaragua; Universidad Nacional Agraria (UNA), Managua, Nicaragua; Kansas State University, and Texas A&M University. In addition, INTSORMIL has a current MOU with the Universidad Nacional Autónoma de Nicaragua (UNAN), Leon, Nicaragua, and maintains ties with the Escuela Agricola Panamericana (EAP), Honduras based upon past collaboration. INTSORMIL maintains a Memorandum of Understanding with the Dirección de Ciencia y TecnologIa Agropecuaria (DICTA) in Honduras, and program activities continue on a limited basis. Historically, INTSORMIL has developed linkages with the regional seed companies Cristiani Burkart (now owned by Monsanto) and Productores de Semillas (PROSEMILLAS), allowing activities in Guatemala, primarily for testing of hybrids/varieties and coordinating support of the sorghum industry in Central America. Given consolidation in the seed industries, these collaborations are, as always, subject to change.

Organization and Management

Since 1999, INTSORMIL program emphasis in Central America has been based in El Salvador and Nicaragua. Scientists from collaborating institutions in El Salvador and Nicaragua have met to discuss and develop country-based research plans for the next year with projects proposed in plant breeding, utilization, plant protection (entomology and plant pathology) and agronomy, and grain quality/utilization.

Financial Inputs

Primary financial support for the program is from the INTSORMIL Central America Regional Program budget, which totaled $40,000 in 2008-2009 which is a significant reduction in budget compared earlier years (which averaged ~$120,000). This drop has obviously had an effect on the scope and depth of the Central American program. These funds were allocated to individual projects within both the Nicaraguan and El Salvadoran research programs. In addition, these funds are used for short-term training, equipment purchases and administrative travel.

Sorghum/Millet Constraints Researched

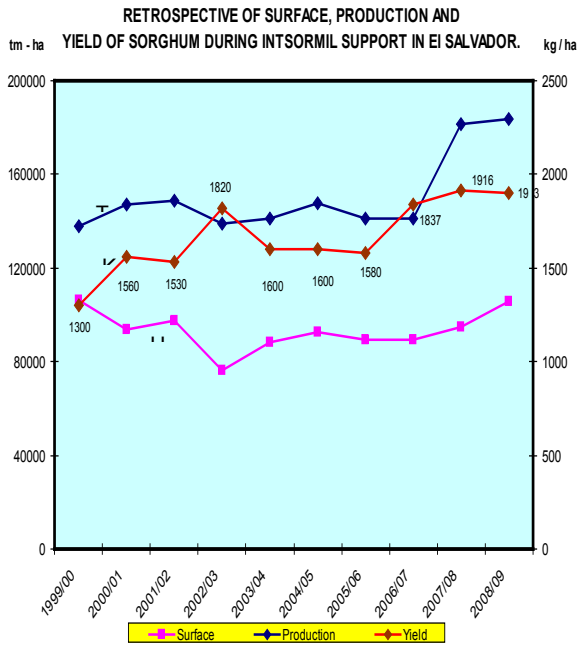
Collaboration

INTSORMIL's Central America program has collaboration with many non-governmental organizations mainly in validation of new sorghum varieties on-farm (see form for complete list), and formal collaboration with national extension services, and it has served as a catalyst for Central American grain sorghum research and technology transfer. Collaborative relationships have been established with a number of universities in El Salvador and Nicaragua, and undergraduate students often complete thesis research on INTSORMIL supported experiments. In addition, René Clara Valencia continues to coordinate the regional grain sorghum yield trials conducted by the PCCMCA. In addition, a strong collaborative relationship has been developed between INTSORMIL's regional sorghum research program and ANPROSOR, the Nicaraguan grain sorghum producers association, which has assisted in identifying research priorities and has collaborated with a number of research studies since 2004. Until 2007, regional scientists have collaboration with the CIRAD-CIAT project on participatory plant breeding for sorghum (and upland rice) (this program was discontinued in 2007).

Sorghum Production/Utilization Constraints

Grain sorghum is the third most important crop in Central America (El Salvador, Guatemala, Honduras, and Nicaragua) after maize and beans. The area devoted to grain sorghum in 2003 totalled 225,000 ha^{-1}, the average grain yield was 1.5 Mg ha^{-1} (FAO, 2004). More recently, statistics in El Salvador document an average yield of > 2.0 Mg ha^{-1} and given that production area has remained static, the overall sorghum production has increased due to the increased yield. While some of this increase may be due to favorable weather, other reasons include the adoption of improved technology (including improved cultivars and hybrids, herbicides, insecticides, planting date, minimum tillage, seed treatments and fertilizer) available to producers.

Small-scale Central American farmers are burdened with low productivity and limited land resources. Intercropping provides a means to increase total productivity per unit land area and reduce the risk of dependence on one crop. The dominant cropping system is maize intercropped with maicillos criollos (called millón in Nicaragua). These tropical grain sorghums are three to four meters tall, drought tolerant, and photopenod sensitive. The grain is used as human food and a feed grain for livestock, and the stover is used for livestock forage. Although maicillos criollos produce low yields, they are planted on approximately 67% of the grain sorghum area in Central America. The limited grain yield response of traditional maicillo criollo varieties to management practices is a primary constraint to increased production. Soil and water conservation, improved production practices and soil fertility management, and increased genetic potential of both maicillos criollos and other sorghum varieties is essential to obtain economical yield increases. To date, increased grain sorghum production, yield and area are due primarily to utilization of improved cultivars (hybrids and varieties), with recent studies documenting improved N use efficiency and N fertilizer response of cultivars spurring interest in increased use of fertilizer.



The rapid increase in the cost and availability of wheat for bread recently emphasized the critical need to develop alternative uses for sorghum grain need to be developed to encourage sustainable economic growth in semi-arid areas in Central America. White-grain, tan-plant colored grain sorghum cultivars are well adapted to Central American human food and livestock feed systems. Innovative processing systems, like extrusion and flaking, are needed to increase starch digestibility and maximize net energy intake for livestock feed. Given current wheat prices, the lack of milling equipment (and the knowledge to use it) for production of grain sorghum flour limits adoption of the use of grain sorghum flour for baked products. Right now, there is a significant economic opportunity reason to utilize sorghum flour in bread products. A critical component of the INTSORMIL program involves the use of that technology to capitalize on this opportunity. Finally, the growth of the animal feeding industry provides a real opportunity for the development and use of sorghum as both a forage and dual purpose crop.

Research Projects and Results

Collaborative research plans of work are planned and organized within both Nicaragua (INTA) and El Salvador (CENTA). Within each research agency, scientists interested in conducting funded research within the mandate of the INTSORMIL program are invited to submit proposals for funding. Projects are reviewed by the regional coordinators and funding is allocated based on mutual agreement on the projects. The areas of emphasis were plant breeding, agronomy, plant pathology, entomology, economics, quality and extension. As the primary cropping year for sorghum begins in August, funding and research are slightly ahead of the INSTORMIL funding year. Activities in this report are associated with the crop year 2008 (May – December 2008).

Plant Breeding

Most of the sorghum improvement program is localized in the CENTA program in El Salvador. At this location, selection, evaluation and the production of hybrid sorghum seed have been emphasized. Segregating populations of both Macio Criollos breeding material and photoperiod insensitive sorghum (both forage and grain types) have been grown in San Andres, El Salvador and selections were made at this site. Of special emphasis is the development of dual purpose sorghums with high forage yield and grain yield. In these populations, both the *bmr* and tannin trait are segregating; while all combinations are being selected, the types that are both brown midrib (bmr) and possess tannins are or primary interest. The target market for this material is the forage industry and they desired brown midrib for increased forage quality; the presence of tannins in the grain minimized the loss of grain to birds. All of these selections will be advanced for further evaluation next year. The most advanced selections are now at the F5 and are ready for replicated testing.

In hybrid testing, the PCCMCA was coordinated by Rene Clara. A total of 8 locations were planted and grown throughout Central America. In El Salvador and Nicaragua, INTSORMIL collaborators conducted these PCCMCA trials. In 2008, the trial had 13 entries with 10 of these entries coming from private industry and the remainder from INTSORMIL supported breeding activities (Table 1) . In these trials, the hybrid ESHG3 (CENTA hybrid with INTSORMIL developed parentage) produced the highest yields in both 2005 and 2006.

Table 1. Results of the PCCMCA sorghum trial, combined across seven locations in Central America.

HIBRIDO	Rendimiento grano. (tn ha^{-1})	Días floración	Altura planta (cm)	Largo Panoja (cm)	Exer-sión (cm)	Enferm. Foliares (1-5)	Color grano
MSG 540	6.08a	68	161	28.1	17.0	2.60	Rojo
MSG 541	5.76ab	67	152	28.6	14.8	2.40	Rojo
SR-340	5.46 bc	66	153	29.1	18.9	2.43	Rojo
AMBAR (TC)	5.38 bcd	66	147	27.4	14.7	2.67	Rojo
SR-360	5.34 bcd	66	151	29.3	18.6	2.58	Rojo
ESHG-3	5.19 bcde	68	137	30.7	19.9	1.85	Blanco
CBH-8078	4.97 cdef	65	145	28.5	17.9	2.60	Rojo
CBH-8076	4.95 cdef	68	150	26.8	18.4	2.55	Rojo
BORA	4.83 defg	65	122	27.5	18.4	2.72	Rojo
CBH-8075	4.73 efg	63	147	31.0	17.6	3.10	Rojo
CBH-8077	4.43 fg	64	118	32.7	14.6	3.67	Rojo
81T91	4.27 g	65	149	25.3	18.3	3.08	Rojo
X	5.12	66	145	28.6	17.2	2.66	
Significancia	**						
DMS	0.61						
CV(%)	16.95						

Seed Production optimization for ESHG3 was evaluated in both El Salvador and Nicaragua. To determine optimum seed production the trial were designed as randomized blocks in a 3x2 factorial; the female:male ratios evaluated were: 3:1 and 4:1 (ICSA613 female: male 86EO361), and three planting dates 0x0 (simultaneous planting), 5x0 (female planted 5 days after the male), and 0x5 (male planted 5 days after the female). In both Nicaragua and El Salvador, differences in planting date did not affect seed yield, indicating that these parents have a good nick. Significant differences were detected for the ratio of

female to male row numbers. Higher seed yields were produced in the R = 3:1 ratio (Table 2). This trial was repeated in 2008; while not shown the trends were exactly the same and the recommendations are that the male and female lines be planted simultaneously with a 3:1 ratio for maximum productivity.

Table 2. Data obtained from seed production trials of the grain sorghum hybrid, ESHG-3 in Santa Cruz Porrillo, El Salvador 2007.

Planting Ratio (Relaciones de siembra)	Planting Time	Height Cms.	Days to Flowering	Seed Set %	Seed Yield kg.ha^{-1}
3:1	5x0	125	61	27	1025.7
	0x0	132	63	42.5	1571.2
	0x5	131	64	32	1038.8
4:1	5x0	128	57	24	691.32
	0x0	131	57	34	898.72
	0x5	133	57	24	640.88
Mean		128.7	59.71	30.18	968.78
Source					
Planting Ratio		*	ns	ns	**
Planting Date		*	ns	ns	ns
Ratio x Date		ns	ns	ns	ns
C.V. (%)		1.81	6.61	29.62	21.01

.

Agronomy

Testing of Line of PS Sorghum 99ZAM 911-3 Y 99ZAM 686-2 in association with maize in El Salvador

Evaluation of two improved Macio-type photoperiod sensitive sorghums (varieties 99ZAM686-2 and 99ZAM911-3) was conducted in on farm trials. Production practices were typical maize/sorghum production (sorghum is planted 25 days after maize). Producers were selected from cooperating producers in different regions of the country where sorghum is grown (Chalatenango, San Miguel, Sonsonete, Ahuachapan). The area for each experimental variety was 500 m2, and each trial included the two experimental and a local check. The experiment was replicated across locations.

The results from 20 locations indicated that 99ZAM911-3 and 99ZAM686-2 yielded nearly the same and both exceeded the local check by an average of 12%. When considered in net revenue (from grain), the use of the improved Macios would net the producers 13% more than the traditional Macio. If the sales of seed are included, the increase of net revenue could be as high as 76%. The maize/sorghum system using these improved varieties even exceeds efficiency of land use on pure cultures of either maize or sorghum. The return on investment was calculated with the sales prices of grain in January, when prices are low and similar for both sorghum and maize. If these were sold in months with higher prices, there would be a greater return.

Producers were surveyed regarding the varieties while on a tour of tests. A total of 50 surveys were returned. Producers responded that the height of the new varieties was acceptable (they were slightly lower, and this would facilitate harvest). From a forage perspective, producers preferred ZAM 911-3 to ZAM 686-2 as it had more leaf area early. The grain panicle of ZAM 911-3 was preferred over local checks and ZAM 686-2 as it was easier to thresh. Finally, the most important trait was grain color and flour color. Most all producers preferred ZAM 911-3 because of the white color of the grain and the white flour that the grain produces. From most all perspectives, ZAM 911-3 was the preferred variety from this test.

Testing of the Photoperiod Sensitive Sorghum 99ZAM676-1 in monoculture and in association with Maize

This test was designed to measure the performance of the photoperiod sensitive sorghum 99ZAM 676-1 in monoculture and maize/sorghum association in on farm trial. Cooperators were selected by extension agencies in areas where sorghum is grown (Chalatenango, Cabañas, San Miguel, Sonsonete, Ahuachapan, la Union). Experimental plots were $1000m^2$, divided into 500m2 for 99ZAM 676-1 and 500 m2 with the local Creole variety. Seed of the improved variety was provided to the producer. Agronomic management was that typical for the producer. Grain and biomass yields were measured at typical harvest time by random sub-sampling of three spots in the larger plot.

The results obtained indicated that 99ZAM 676-1, exceeded the performance of local varieties for grain by an average of 877 kg/ha and biomass yield by an average of 1787 kg/ha. In addition, ZAM 676-1 was slightly shorter and easier to harvest than some local varieties. Economic analysis indicates that 99ZAM 676-1 has the best return and also the most cost-effective because for every dollar invested, it generates .67 cents greater return than the local variety. This would increase if the grain is sold later in the season when prices are high.

Difusión de variedades mejoradas de millón para el sistema asocio con maíz, en las zonas secas de Las Segovias, Matagalpa y Chinandega.

In Nicaragua, approximately 25,000 hectares of photoperiod sensitive sorghum are planted annually. These varieties typically have white grain and endosperm, they are tall and have an average yield of 1,500 kg/ha. Most of this crop is planted in association with maize and on small hillside farms. The sorghum is planted as security for rural families to feed themselves in areas where the yield of maize and beans are reduced by drought. To encourage production of improved Macios, three blocks of photoperiod sensitive sorghums (varieties EIME 119, ES 790 and 85 SCP 805) were grown to produce 25 quintals EIME 119, 28 quintals of ES - 790 and 37 qq 85 SCP 805, for a total of 90 quintals of seed.

In May 2008 this seed was distributed to 900 producers (individual and cooperative) in the departments of Esteli, Madriz, Chinandega and Matagalpa. The producers will use this seed to plant between 13,000 to 43,000 manzanas in in association with maize. In addition, local extension will assist producers in using this seed effectively to produce the next crop, partition a quantity to use as seed and market the remaining as either seed or grain.

The effect of planting density and fertilization on forage yield sorghum forage variety INTA: In 2007, four populations of the Forage Variety INTA were evaluated (266,000, 332,500, 399,000 and 465,500 plants per hectare). Each population was tested at four nitrogen levels (0, 65, 130 and 195 kg/ha).
No interactions were detected between population density and N level and there was no statistical difference in biomass yield based on population density. Nitrogen was a significant effect and with the best yields produced both the 130 and 195 kg/ha N rates. Because there was no statistical difference between these rates, use of the lower N rate was more cost effective, producing 55.6 and 21.8 Mg/ha fresh and dry weight, respectively. The N rate study was repeated in 2008 with an essentially linear response to N being observed (Table 3).

Table 3. The effect of nitrogen rate on biomass yield and plant height in multiple cuts of the INTA forage hybrid in Managua, Nicaragua.

Nitrogen Rate	Biomass Yield (Kg/ha) Primary Cut	Height (cm.) Primary Cut	Biomass Yield (Kg/ha) Second Cut	Height (cm.) Second Cut
65 Kg/ha	8405	184.88	3531	128.25
130 Kg/ha	9118	194.25	4727	134.69
195 Kg/ha	12571	196.81	5612	143.94
0 Kg/ha	5269	125.25	1979	108.69

Grain Utilization – Food Use

In 2007-2008, the cost of wheat flour quadrupled in El Salvador. Bakers across the country requested government solutions to the problem that consisted of subsidies, tax elimination, credits, etc. This situation provides an outstanding opportunity to promote and stimulate the use of sorghum flour as a substitute for part of the wheat flour in baked products. At the current price of wheat flour, sorghum is approximately ½ the cost. In response to this situation, in March CENTA, through the Food Technology lab published two newspaper articles and appeared on three different news broadcasts describing the use of sorghum as a flour substitute for wheat (http://www.centa.gob.sv/Videos.aspx ; http://www.laprensagrafica.com/departamentos/1004993.asp ; http://www.laprensagrafica.com/economia/1004098.asp)

This promotion piqued the interest of many people from the food and bakery industries, and additional information and training was requested from CENTA's food lab. In the past year, CENTA food scientists have conducted four training sessions and educated approximately 100 participants. These demonstrations had two objectives: 1) to produce sorghum flour using a small mill (Omega VI) donated by INTSORMIL and 2) to demonstrate the utilization of sorghum flour as a substitute of wheat in different products.

As a result of trainings, big bakeries like Santa Eduviges, Pan Rey, and Monico located in San Salvador and surrounding areas, and many small and medium bakeries and productive groups from rural areas begin conducting trials with sorghum flour and actually they are using it to produce many of their products. "Pan Rey" a medium bakery located in Apopa, San Salvador, is producing its own flour, but is limited in their production by the limited supply of high quality sorghum grain. CENTA, through the INTSORMIL program is assisting them by identifying which hybrids they should buy. This has helped, but consistent supplies of good quality grain are difficult to find. They are using sorghum flour in a diversity of their products they are currently conducting trials right now with French bread formulation using 20% and 25% of sorghum flour. Consumer acceptance of their baked products with sorghum is good.

Sorghum milling capacity is slowly but consistently increasing. In 2007 two Omega VI mills were purchased by INTSORMIL and our currently being used in El Salvador to produce sorghum flour. A small producer (Kris Duville) and CENTA's food lab are now providing this flour in a small scale. The Omega VI mill has a capacity of 2 pounds per minute. To get good particle size (flour pass through a mesh of 80) the flour must pass through the Omega VI at least four times but this is less than seven (what was required in a nixtamal mill). These mills, located in strategic points, will likely be more effective to supply sorghum flour than a large milling company in a single location, primarily because of transportation costs and logistics. To supplement this work, an additional five omega mills were distributed at strategic locations throughout the country. Training for their use was provided as part of the INTSORMIL technology training.

La Colina a food processor specializing in Central American Ethnic Foods also requested training related to sorghum and flour production. A meeting with CENTA's cereal program personnel and the food lab personnel was conducted; CENTA is producing 3 hectares of food quality sorghum to be harvested in November, 2008; they will use the grain for flour production. GUMARSAL Company is going to mill all the sorghum produced and the flour is going to be used at La Colina's bakery to elaborate a diversity of sweet breads, cookies and healthy products to export to the USA. This company actually is exporting a diversity of products like frozen fruits, processed vegetables, chutneys, tamales, semitas and other Salvadorian ethnic foods. Last week CENTA's food lab provided La Colina with 200 pounds of fine flour to start conducting trials. CENTA's technicians will be involved in the trials. In addition to these

examples, there are numerous other opportunities to use sorghum as a wheat substitute. CENTA is exploring and acting on these opportunities as appropriate. INTSORMIL is supporting this effort as well.

The quality of sorghum produced domestically becomes a more important issue when the grain is sold for commercial use. Samples of commercially produced grain were evaluated for milling quality; some were better than others (Table 4). Quality will continue to be a critical component as grain is moved for commercial food use purposes.

Table 4. Grain quality parameters and milling quality of grain from El Salvador Macio Criollos grown commercially in 2008.

Sorghum Variety	Endosperm Texture	Test Weight (Kg./hl)	100 grain weight (g)	Grain Color	Glume Color	Diám. (mm)	Mill Yield (90 mesh) (%)
Centa-texistep	Soft	65.27	2.33	Cream	Purple	3.6	32.19
Punta de Lanza	Soft	59.95	3.6	Cream	Red	4.0	43.57
Zapa Sonsonate	Soft	62.33	2.46	White	Red	3.3	45.51
Cacho de Chivo	Soft	60.28	3.35	White	Tan	3.2	51.37
Mnzano	Hard	64.68	2.53	Cream	Purple	3.6	48.83
Guacotex	Soft	60.10	2.87	White	Purple	3.7	47.15
Sapo %	Hard	60.95	3.53	White	Purple	4.6	38.95
Nueva Guadalup	Soft	59.71	2.70	Pearly	Red	3.2	41.70

Interest in sorghum as a supplement to wheat flour is now gaining interest in Nicaragua. Ing Eliette Palacios, INTA sorghum specialist who was trained as part of INTSORMIL activities in El Salvador has is now developing a program in Nicaragua and will be training interested bakery owners on milling and using sorghum flour in their bakery operation.

Technology Transfer

Seed production of released varieties of sorghum (Sorghum bicolor L. Moench)

This project is conducted to increase seed of improved varieties of sorghum INTA RCV and INTA SR-16, INTA-Forrajero and release the seed to market as commercial varieties.

On April 29 two varieties (INTA RCV and INTA SR-16) were released by INTA. For each variety, phenotypic descriptors and seed (40 qq INTA RCV and 30 qq of INTA SR-16) were produced. This seed will be distributed to the Pacific zone of Nicaragua where the use of the grain is primarily for animal feeding. Each producer will be provided with approximately 20 lb of seed. The distribution should provide seed to approximately 3500 farmers to plant about 65,000 manzanas. This distribution should allow producers across the región to learn the new varieties. In addition, in 2008, seed of the variety 'Soberano" was increased by four farmer groups for sale/distribution to local farmers in El Salvador. From these growouts, overseen by INTSORMIL funded scientists, almost 100 hectares of seed were grown, producing approximately 475 metric tons of seed (Table 5).

Table 5. Seed production of the sorghum variety 'Soberano' in El Salvador in 2008.

Farmer Group	Hectares	Production (tons)
ADISA	56	280
ACOPAI	12	55
FECASAL	14	70
FORO AGRO	14	70
Total	96	475

Production and Transfer of Improved Sorghums to Small Producers in El Salvador

The objective of the Project is to improve the productivity and profitability of small producers in NE El Salvador. During the first year seed was produced for eight varieties (85SCP805, 790, 226, Soberano, RCV, CENTA S-2, CENTA S-3 and Jocoro). Extension training to use these varieties was in the New Conception area. Seed of these varieties was provided to establish 321 plots and 227 varieties insensitive sorghums, making a total 548 plots, using 10 pounds per plot. Yield and productivity was measured and summarize for 211 plots. Seed was also provided to small producers specifically to produce additional seed for sale. A total of 260.50 quintals of sorghum seeds were produced for use in extension agencies that have areas of influence in the northeastern part of the departments of Chalatenango, Cabanas, Cuscatlan, Morazán, San Miguel and Union.

Sorghum Utilization

Since March 2008, sorghum utilization experts at CENTA have conducted 26 workshops on sorghum utilization for food and flour production and 5 additional workshops to demonstrate Omega VI mill functionality to interested people. From these demonstrations, there is now one large scale sorghum flour producer in country and approximately 125 small bakeries using sorghum flour to some extent in their operation. These bakeries are associated with the Artisan Bakers Association (data provided from the president of the bakers association, Nelson Calderon). Finally, there are at least eight small food industries using sorghum in their commercial and mass distributed products.

Ms. L. Taylor, Compatible Technology International (CTI) Volunteer presented workshop on the utilization and production of Omega VI attrition mills for use in grinding sorghum and other grains. This workshop was instrumental in gaining significant interest in locally producing the grinders using blueprints and key parts from CTI. The Omega VIs in Salvador continue to perform efficiently and interest in their use is growing. They are relatively inexpensive to buy and maintain. They are useful for grinding other commodities as well. The Children's Relief Foundation close to CENTA's headquarters have used the grinders to prepare blends of sorghum flour with wheat/maize to produce more foods with existing resources. The sorghum based foods have been readily accepted and are less expensive.
The WINROCK Foundation approved a two week Farmer to Farmer program for a specialist to spend two weeks in Salvador working with the use of the mills and developing information on food processing using sorghum blends. Ms E. Pinella, Graduate Student, Cereal Lab, TAMU will be the volunteer.

Ms. Eliette Palacios, INTA, in Nicaragua has utilized the Omega VI mill to improve sorghum processing similar to what has been done in El Salvador. The interest is high and a substantial increase in consumption of sorghum foods is occurring where the technology has been introduced. Ms Palacios received $2500 from FAO to expand her activities. The results in Salvador are being transferred to Nicaragua with similar positive results especially for the small producers and bakeries.

Networking

Several INTSORMIL collaborators attended and made presentations at the 54th annual PCCMCA meetings held in Mexico in September 2009. INTSORMIL regional fund supported the travel of Vilma Calderon, Salvador Zeledon and Rene Clara to the meeting to make presentations. Regional Coordinators Rene Clara and William Rooney traveled throughout Nicaragua, Honduras and El Salvador during harvest season to review programs and project activities. Ing Nury Gutierrez of INTA traveled from Nicaragua to El Salvador to learn sorghum hybridization techniques from INTSORMIL supported CENTA staff. Drs. Joe Hancock and Lloyd Rooney traveled to the region to review and participate in collaborative research project related to animal feeding and food uses of sorghum. An agreement between CARE and INTSORMIL was formalized in the spring of 2008 to cooperate on the development and extension of sorghum into El Salvador for a period of two years. Additional agreements with other NGOs are in the discussion phase of development. In sorghum utilization, five Omega mills have been purchased and

distributed to bakeries in small regions to promote the use and integration sorghum flour into bakery products in El Salvador. Ing Vilma Calderon has made numerous demonstrations throughout the country regarding the use of sorghum flour as a substitute for wheat flour, including several popular press articles in both print and broadcast media.

Executive Summary Information

The INTSORMIL program in Central America continues to produce results based on the long term activities in the region. Research in plant breeding, agronomy, pest control and utilization have created varieties and hybrids with improved yield potential, management programs to capitalize on that potential and then development of end use for the products that are produced. Support of extension programs provides the conduit to educate the producers and end users on the effect use of these materials.

The program faces several significant hurdles to future success. First and foremost, the current budget is marginal and it has required significant cuts in research, both in scope and the depth of the programs. Current funding levels simply cover basic research activities; leaving little to none for further educational capacity or extension of results through technology transfer. It is imperative that program coordinators identify new and creative ways to access funds for the support of programs in the regions. Second, the development of human capacity through education is becoming a critical need. Although budget constraints would limit any significant funding for formal training, this limitation will eventually reduce the effectiveness of the program. We must find an effective approach to minimize this problem in the near future.

Table 6. Objectives, notional targets, benchmarks and indicators, throughputs, and milestones

Objectives	**Targets**	**Benchmarks and Indicators**	**Throughputs**	***Milestones***
1. Supply chain/market development	- Increased yields and incomes - Increased pearl millet quality -Increased use of sorghum as a feed source	- Increased farmer incomes - Increase in production area - Elimination of tannin in feed–type cultivars	- Farmer incomes increased by 30% - Farmer incomes increased by 20% - 200% increase in markets for sorghum as a feed source	*- 15% increase by Yr 3 and 30% by Yr 5* *- 5% increase by Yr 3 and 20% by Yr 5* *- 60% increase by Yr 3 and 200% by Yr 5*
2. Nutrition, health and grain quality	-Higher grain quality cultivars -New cultivar acceptance - Increased nutrition of food and feed products	- High digestibility cultivars selected - Widespread adoption of cultivars - High starch digestibility cultivars developed	- 10 high grain quality varieties developed - 60% of farmers accept new cultivars - Nutritional deficiencies in diets decreased by 25%	*- 4 varieties released by Yr 3 and 10 by Yr 5* *- 20% of farmers accept new cultivars by Yr 3 and 60% by Yr 5* *- 10% decrease by Yr 3 and 25% by Yr 5*
3. ICSM	- Increased and stable grain yields - Improved crop, soil and water management	-ICSM components identified - Integration of ICSM components into packages	- 30% yield increase due to ICSM adoption - 70% of farmers using ICSM practices	*- 10% increase by Yr 3 and 30% by Yr 5* *- 25% using ICSM practices by Yr 3 and 70% by Yr 5*
4. IPM	-Increased grain quality - Efficient pest management tactics -Reduced pesticide use	- Tolerance to grain insects, pathogens - IPM packages developed - Non-pesticidal strategies developed	- 20% decrease in insect-damaged grain - 4 varieties with insect resistance released - 50% decrease in kg pesticide used/ha	*- 5% decrease by Yr 4 and 20% by Yr 5* *- 1 variety released by Yr 3 and 4 released by Yr 5* *- 20% decrease by Yr 3 and 50% by Yr 5*
5. Genetic enhancement	-Stable yielding genotypes -More efficient water use by genotypes -More efficient nutrient use by genotypes	- Genotypes with less variation in yields - Decrease in drought damage - Savings in fertilizer costs	- 6 stable yielding genotypes released - 10 drought tolerant genotypes released - 4 N efficient genotypes released	*- 2 genotypes released by Yr 3 and 6 by Yr 5* *- 4 genotypes released by Yr 3 and 10 by Yr 5* *- 1 genotype released by Yr 3 and 4 by Yr 5*
6. Genetic resources and biodiversity	-Higher yielding genotypes -Conservation of genetic biodiversity	- Selection of high yielding genotypes - Decrease in rate of loss of	- 25% increase in yield of new genotypes - 20% decrease in use of biodiversity	*- 10% increase in yield by Yr 3 and 25% by Yr 5* *-5% decrease in use of biodiversity*

		biodiversity sensitive areas	sensitive areas due to increased yields	*sensitive areas by Yr 3 and 20% by Yr 5*
7. Partnerships and networking	*- Increased joint programs with partners*	*- Networks established involving all stakeholders (private industry, NGOs, farmers, international agencies, CG centers, research and technology transfer agencies)*	*- High research throughputs and high level of technology transfer activity*	*- 20% increase in grain production and 75% of farmers using best management practices by Yr 5*

From: Bill Rooney
To: "Nina Estrada"
Subject: RE: MTA Turkey
Date: Thursday, November 05, 2009 2:11:00 PM
Attachments: 11.04.09 MTA Turkey.pdf

Signed document attached.
Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

-----Original Message-----
From: Nina Estrada [mailto:NAEstrada@ag.tamu.edu]
Sent: Wednesday, November 04, 2009 1:24 PM
To: Bill L Rooney
Subject: MTA Turkey

Dr. Rooney,

Attached you will find an MTA that is in need of your signature. Please sign and return it to me via email at your earliest convenience. Thanks.

Kindest regards,

Nina Estrada
Lead Office Associate
Contracts and Grants
Texas A&M AgriLife

MATERIAL TRANSFER AGREEMENT

This Material Transfer Agreement ("Agreement") is made between Kahramanmaras Sutcu Imam Universitesi ("INSTITUTION") an academic and research institution with principal offices in Kahramanmaras, Turkey and Texas AgriLife Research ("AGRILIFE"), a part of the Texas A&M University System, having principal offices in College Station, Texas. The parties to this Agreement are collectively referred to as the "Parties" and individually as a "Party."

RECITALS

WHEREAS, AGRILIFE owns certain sorghum germplasm lines that have been selected for sugar concentration, biomass yield, plant height, and maturity ("MATERIALS");

WHEREAS, INSTITUTION has expertise related to the evaluation of sorghum lines and plans to use the MATERIALS for RESEARCH PURPOSES;

WHEREAS, INSTITUTION has requested the MATERIALS, and AGRILIFE is willing to provide the MATERIALS solely for RESEARCH PURPOSES;

NOW, in consideration of the mutual covenants and premises contained in this Agreement, the receipt and sufficiency of which is acknowledged, the Parties agree to the following:

1. "MATERIALS" means experimental sorghum germplasm line developed by AGRILIFE and identified as any progeny and derivatives of the line, be it seed or any type of sexual or asexual propagating material; and any naturally occurring modifications such as mutations, offtypes, or variants generated from MATERIALS.

2. "RESEARCH PURPOSES" means the development of recombinant inbred lines ("RIL") in order to map quantitative trait loci ("QTL") for biomass quality and yield and composition traits. RESEARCH PURPOSES excludes transgenic or traditional breeding activities (except for creating the RIL) using MATERIALS. Furthermore, RESEARCH PURPOSES excludes any sale, transfer, or disposition of MATERIALS for commercial exploitation purposes.

3. "INTELLECTUAL PROPERTY" means all inventions, discoveries, or tangible materials conceived, reduced to practice, or developed through INSTITUTION'S use of MATERIALS.

4. INSTITUTION acknowledges that the MATERIALS are and remain the valuable and sole proprietary properties of AGRILIFE and ownership in MATERIALS shall be retained by AGRILIFE. INSTITUTION will to the best of its ability utilize the MATERIALS in a manner that serves to protect the proprietary interests of AGRILIFE.

5. INSTITUTION agrees that all MATERIAL received hereunder will be used only for RESEARCH PURPOSES and will not be used for other purposes, including but not limited to breeding purposes, the development of improved sorghum lines, or any commercial purposes.

6. INSTITUTION further agrees that all MATERIAL received hereunder will be used only at the facilities of the INSTITUTION and will not be used, directly or indirectly, for any commercial purpose whatsoever. The INSTITUTION must not transfer or provide materials or any portion thereof to any other organization or individual than as otherwise allowed in this Agreement without the prior written consent of AGRILIFE.

7. INSTITUTION agrees that the MATERIAL received hereunder may not be used in any sponsored research or other research programs if the terms of such program would entitle the sponsor or any third party to any ownership, rights or interest in such research or its results, including any INTELLECTUAL PROPERTY developed through the scope of the work.

8. In the event that INSTITUTION desires to utilize MATERIALS for any uses beyond the scope of this Agreement, the Parties shall first enter into good faith negotiations to establish the terms and the conditions for any such anticipated purposes. Nothing in this Agreement shall be construed as a representation that AGRILIFE may guarantee the grant of such rights.

9. Any publication describing the INSTITUTION'S use of MATERIALS shall acknowledge the source of MATERIAL and INSTITUTION will provide a copy of such publication to AGRILIFE.

10. INSTITUTION will pay for the expenses incurred in handling and shipment of the MATERIALS to INSTITUTION. Such expenses will be paid by INSTITUTION upon receipt of a supporting invoice from AGRILIFE.

11. Within thirty (30) days following the completion of INSTITUTION'S testing of MATERIALS, or the termination or expiration of this agreement, whichever is earlier, INSTITUTION will provide to AGRILIFE a written report of the INSTITUTION'S efforts and results obtained using MATERIAL during the evaluation period. INSTITUTION agrees that AGRILIFE may use such reports and data for its own purposes.

12. AGRILIFE is an agency of the State of Texas and nothing in this Agreement waives or relinquishes AGRILIFE's right to claim any exemptions, privileges, and immunities as may be provided by law.

13. All MATERIAL provided hereunder should be considered experimental and should be handled by INSTITUTION with appropriate safety precautions. **AGRILIFE MAKES NO REPRESENTATIONS AND EXTENDS NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NOR DOES AGRILIFE ASSUME ANY OBLIGATIONS WITH RESPECT TO INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OR OTHER RIGHTS OF THIRD PARTIES DUE TO INSTITUTION'S ACTIVITIES UNDER THIS AGREEMENT. TO THE EXTENT ALLOWED BY LAW, INSTITUTION HEREBY AGREES TO INDEMNIFY AND HOLD HARMLESS AGRILIFE FROM ANY AND ALL LIABILITY AND/OR DAMAGES (INCLUDING COST OF DEFENSE) PROXIMATELY CAUSED BY ITS USE OF THE MATERIAL.**

14. INSTITUTION or AGRILIFE may terminate this Agreement at any time by providing written notice to the other at least thirty (30) days before the termination is to take effect. All accrued obligations and claims, including claims or causes of action for breach of this Agreement, shall survive expiration or termination of this Agreement.

15. Notices, reports, or other communications required by this Agreement shall be sufficiently made or given if mailed by certified First Class United States mail, postage pre-paid, or by commercial carrier (e.g., FedEx, UPS, etc.) when such carrier maintains receipt or record of delivery, addressed to the address stated below, or to the last address specified in writing by the intended recipient.

(a) If to AGRILIFE

Ms. Diane Gilliland, Assistant Director
Texas A&M AgriLife, Contracts and Grants
3000 Briarcrest Drive
Suite 101
Bryan, Texas 77802
Ph. (979) 845-4781; Fax: (979) 862-7775

with a copy to:
Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Texas AgriLife Research
Texas A&M University, Department of Soil and Crop Sciences
College Station, TX 77843-2474
wlr@tamu.edu

(b) If to INSTITUTION:

Doc. Dr. Yuksel Bolek
Kahramanmaraş Sütçü İmam Üniversitesi Ziraat
Fakültesi, Tarla Bitkileri Bolumu, Kahramanmaraş,
Turkey, 46100
Ph. +90 (344) 219 10 00
Fax. +90 (344) 219 15 26

16. This Agreement shall expire December 31, 2011.

17. Upon expiration or termination of this Agreement, INSTITUTION agrees to destroy or return, at AGRILIFE's request, any MATERIALS in INSTITUTION's possession. INSTITUTION understands and concurs that AGRILIFE shall not be responsible for any costs or liabilities incurred by INSTITUTION in the process of evaluating, testing, or destroying MATERIALS or any part thereof.

18. The undersigned by executing this Agreement represents that he/she is authorized on behalf of INSTITUTION to enter into this Agreement for and on behalf of INSTITUTION.

19. This Agreement, with the rights and privileges it creates, is assignable only with the written consent of both Parties.

20. Each Party is and shall remain an independent contractor as long as this Agreement is in effect and neither Party shall act as an agent, legal representative, partner or joint venturer of the other Party for any purpose whatsoever and the employees of one shall not be deemed to be the employees of the other. This Agreement is not intended to restrict or confine either Party in independent development of the underlying plant material, as long as such independent

development does not compromise the rights or obligations of the Parties prescribed in this Agreement.

21. This Agreement shall be governed by and construed under the laws and constitution of the State of Texas.

22. This Agreement contains the entire understanding of the Parties, and supersedes all other written and oral agreements between the Parties. This Agreement may be modified or amended only by a written agreement signed by both Parties.

23. This agreement may be executed in any number of counterparts, including facsimile or scanned PDF documents. Each such counterpart, facsimile, or scanned PDF document shall be deemed an original instrument, and all of which, together, shall constitute one and the same executed Agreement.

24. If any provision of this Agreement is invalid, illegal, or unenforceable, the validity, legality and enforceability of the remaining provisions will not in any way be affected or impaired. A waiver of any breach of this Agreement does not waive any other breach of the same or other provision of this Agreement. A waiver is not effective unless made in writing.

The Parties have caused this Agreement to become effective as of the date last provided below.

Kahramanmaras Sutcu Imam Universitesi	Texas AgriLife Research
_____	_____
By:	By:
Title:	Title:
Date: _____	Date: 11-2-09
Acknowledged by:	Acknowledged by:
_____	_____
INSTITUTION Recipient Scientist	AGRILIFE Provider Scientist
Name:	Name: William L. Rooney, PhD
Title:	Title: Professor
Dept:	Dept: Texas AgriLife Research
Date: _____	Date: _____

From: Bill Rooney
To: "Kerry Mayfield"
Subject: RE: Proposal
Date: Monday, November 02, 2009 8:30:00 AM
Attachments: Mayfield Proposal v4,0.docx

A few comments and edits.

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

From: Kerry Mayfield [mailto:kerry-mayfield@tamu.edu]
Sent: Saturday, October 31, 2009 2:41 PM
To: Bill Rooney; Seth C. Murray; Thomas Isakeit; Gary Odvody
Subject: Proposal

Greetings All,

Since we have all been traveling lately, I hope everybody has had good travels.

Please find attached a draft of the proposal for my research.
I look forward to any comments on the proposal.

Reminder Exam Schedule:

Rooney	10/6
Odvody	10/10
Isakeit	10/12
Murray	10/15

Oral 10/23—Afternoon
I have Heep 437 reserved for the afternoon of October 23.

Have a great weekend
Kerry

Kerry Mayfield
Maize Breeding and Genetics
Texas AgriLife Research
Department of Soil and Crop Sciences
Texas A&M University
College Station, TX 77843-2474

979-845-4195 phone

979-862-1931 fax
kerry-mayfield@tamu.edu

From:	Bill Rooney
To:	"Pedersen, Jeff"
Subject:	RE: quick question
Date:	Thursday, November 05, 2009 3:18:00 PM
Attachments:	MP-510.pdf Tx642-645 Sorghum.pdf

Jeff:

Attached is descriptive on Tx7078 (MP-510) and a public release document on B35 (Tx642). There are no registrations for either of these lines, so these are about as good as it gets.

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

From: Pedersen, Jeff [mailto:Jeff.Pedersen@ARS.USDA.GOV]
Sent: Wednesday, November 04, 2009 11:22 AM
To: Bill Rooney
Cc: Joshua Wong; Peggy Lemaux
Subject: quick question

Bill:
I am working on a manuscript and need proper citations for Tx7078 and B35. GRIN is not helpful. Can you help me out.
Jeff

ently not outstanding. The reaction of A3029 to head smut is not known.

A3042 was produced by male-sterilizing a Redbine, SA 5507-31-3-4-2-6-1. The male-sterility of this A-line is satisfactory. This A-line is 6 to 8 days earlier in heading than Combine Kafir-60. The combining value of A3042 is apparently not outstanding and its reaction to head smut is unknown.

POLLEN PARENTS, OR R-LINES

R3067 is Combine White Feterita, SA 6649-3-3-7-8, whose parentage is the same as that of Tx 09. This strain was selected as a possible replacement for Tx 09 and has the same advantages and disadvantages as Tx 09 but may produce a little more pollen. It is 4 or 5 days earlier in blooming than Tx 09.

R38-2 originated as a chinch bug resistant strain in the breeding work conducted at the Lawton (Oklahoma) Field Station of the U. S. Department of Agriculture in the 1930's by R. O. Snelling, R. G. Dahms, W. M. Osborn and J. H. Martin. The strain was never distributed officially, but was retained in the sorghum nursery as La 38-2 at Chillicothe because of its insect resistance. Milo, kafir and feterita (Club x Day) were included in the parentage of this strain. This R-line is resistant but not immune to head smut. Its seed are red and the seed of its hybrids have a dull unattractive red color. Its hybrids tend to be tall, late maturing and high yielding. None of its hybrids has been put into production by the Texas Station because its late-maturing hybrids were seen to lodge. Late-maturing hybrids in a yield trial containing earlier maturing hybrids are usually neglected. Perhaps its hybrids would not lodge unduly if watered adequately. This R-line will probably be more valuable when converted to a four-dwarf.

Tx 09, Combine White Feterita SA 396 (SA 6649-3-1), is outstanding in combining value, but its hybrids tend to be tall and their seed a little low in test weight. This R-line is resistant but apparently not immune to head smut. Its seed are large and white and its glumes are without awns. Tx 09 sheds sufficient pollen to produce satisfactory seed sets on A-lines but, because of its different parentage, reacts differently to growing conditions and does not always bloom with the A-lines with which it is planted. This R-line is the male parent of RS 630, one of the highest-yielding hybrids. Because of its outstanding combining value and resistance to head smut it is being converted to a four-dwarf.

R3068 is a Combine White Feterita, SA 6649-4-5-4-4, whose parentage is the same as that of Tx 09. Like R3067, this strain was selected as a possible replacement for Tx 09 and has the same advantages and disadvantages as Tx 09, but may produce a little more pollen.

R3007 is a selection from Day x Dalhart Resistant Wheatland that was made by J. C. Stephens when he was looking for pollinators for the Day male-sterile in the 1940's. The strain is an R-line for cytoplasmic male-sterile A-lines. The combining value of this R-line is high. None of its hybrids was put into production because they yielded no higher than RS 610 and because their ability to stand was questionable. This R-line is moderately susceptible to head smut. Crossing this R-line on Martin results in a high-yielding hybrid.

Tx 7078 is Combine 7078 and was a widely grown variety before the advent of sorghum hybrids. The parentage of this strain is unknown because of confusion in labelling plants in an F_1 nursery, but its genetic characteristics indicate that it has milo and kafir in its parentage. Tx 7078 looks like milo rather than kafir. A second generation of a Sooner milo x Tx 7078 cross segregates little except for height which indicates a preponderance of milo characteristics. This R-line is the male parent of RS 610 and RS 608, both widely grown grain sorghum hybrids. Tx 7078 has reddish-yellow seed and is awned. The strain is susceptible to head smut and to chinch bugs. The combining value of Tx 7078 with most A-lines is outstanding.

R38-33 is another chinch bug resistant strain of Club x Day parentage (La 38-33) that originated at Lawton, Oklahoma. The seeds of this R-line are red. This pollinator has outstanding combining value, but its hybrids were not put into production because of tall stature and lodging. In the yield trials its hybrids probably lodged because their late maturity caused them to exhaust the soil moisture just before maturity. The head smut tolerance of this strain has not been determined.

Tx 7000 is Caprock and originated in the breeding blocks at the Lubbock station and was widely grown at one time. Its seeds are red and the lemmas bear short awns. This R-line does not restore fertility completely, but this fact is not very apparent since Texas 660, for instance, sets seed quite well. Tx 7000 is somewhat resistant to head smut.

Tx 04 was selected from a cross of Martin x Plainsman, SA 5904. This R-line is a red combine type that blooms at approximately the same time as Tx 3197. The heads of this strain dry well and have good exsertion. Tx 04 produces large amounts of pollen. None of its hybrids with kafirs or Martin is outstanding in vigor.

Tx 07 is a Redbine and is the male parent of Texas 620 and RS 681. This R-line blooms approximately 1 to 2 days later than Tx 3197. Tx 07 sheds large amounts of pollen. RS 681, Tx 399 x Tx 07, is a specific combination with considerable hybrid vigor, but most Tx 07 hybrids are not outstanding in yield. RS 681 is the only Wheatland hybrid that threshes well.

MP-510
APRIL 1961

An Evaluation of

PARENTS OF GRAIN SORGHUM HYBRIDS

THE AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS
TEXAS AGRICULTURAL EXPERIMENT STATION
R. D. LEWIS, DIRECTOR, COLLEGE STATION, TEXAS

IN COOPERATION WITH THE U. S. DEPARTMENT OF AGRICULTURE

Plant Materials Release Proposal

Date: February 13, 2002

1. Crop: *Sorghum bicolor* (L.) Moench Type of Release: Parental Line

2. Proposed Name or Identification: A/BTx642, A/BTx643, A/BTx644, A/BTx645

3. Designation or Name in developmental Stages: Various, see attached release proposal

4. Primary features or advantages: Each parental line has unique characteristics that make it suitable for release. The traits include, but are not limited to: high yield, foliar disease resistance, and drought resistance.

5. Plant Variety Protection: Yes _____ No __XX___ Undecided _____

6. Seed available and date: At least 2.5 kg of each A/B is currently available.

7. Proposed Seed Distribution:
   To TFSS for increase and distribution ___No___,small samples distributed by
   Breeder ____Yes_____ TFSS _____No_____ Exclusive ___No
   (1) Royalty ____Yes___(1)
   (1) Additional information necessary __See attached (#1)____

8. Provisions: None_____.

9. Suggested Fees (for parental stock): $300 for private companies for complete sets. $100 for each individual parental line. No fee for public research programs.

10. Supportive Documents:
    a. Release Proposal
    b. Registration Article to Crop Science

11. Submitted:

Breeder/Date Unit

Original signed by Or
D. T. Rosenow
Professor, Sorghum Breeding and Genetics
TAES, Lubbock

Head/Date

iginal signed by
Jaroy Moore
Resident Director
TAES, Lubbock

Original signed by
M. A. Hussey
Head, Soil & Crop Sciences
TAMU, College Station

RELEASE PROPOSAL FOR FOUR A/B SORGHUM PARENTAL LINES

Four sorghum [*Sorghum bicolor* (L). Moench] female parental lines have been evaluated in hybrid combinations over several environments for agronomic and yield traits. These lines were selected for release based on their agronomic desirability and unique combination of disease resistance and grain quality traits of importance to sorghum breeders and their performance in hybrids. These characteristics and traits found in these lines should be of value to the sorghum breeding industry. Some of these lines may be useful directly as parents, while others maybe more useful as breeding stock. All four lines are in the A_1 cytoplasmic male-sterility system. Maintainer lines of all four females lines will be released as well.

PROPOSED NAMES AND SEED HANDLING

These lines were selected, increased and developed in the sorghum breeding program based at Lubbock, TX, but with selection and evaluation Statewide. The lines and their hybrids were evaluated in replicated yield and agronomic experimental trials in various locations in Texas and in Regional Yield Trials located in various states, and we propose that these lines should be released as parental lines. Using the numbering system of the Texas Agricultural Experiment Station sorghum improvement program, these parental lines should be designated as A/BTx642 through A/BTx645. Upon release, the lines will be registered in *Crop Science* and seed of these lines will be deposited at the National Seed Storage Laboratory in Fort Collins, Colorado. Seed will be maintained and distributed by the Texas Agricultural Experiment Station at the Texas A & M University Agricultural Research and Extension Center at Lubbock, Route 3, Box 219, Lubbock, Texas 79403-9757.

BREEDING HISTORY AND METHODOLOGY

All of these lines were developed from intentional crosses using the pedigree method of plant breeding. The pedigrees for the four parental lines are listed in Table 1. Most of the parents in the pedigrees of these germplasms are publicly released. Male sterile (A-line) versions of these B-lines were created via backcrossing with ATx623 as the source of A_1 cytoplasm. Each A-line has 15 or more backcrosses and identical to the B-line counterpart in all phenotypic traits. The A-lines are 100% male sterile except that ATx642 sometimes will set scattered seed under hot, moisture stressed conditions. All four parental lines are three dwarf lines ($dw_1Dw_2\,dw_3dw_4$) and have no testa ($b_1b_1B_2B_2$) (Schertz and Stephens, 1966). From 1991 to 2000, these lines and their hybrids were included in numerous replicated tests within the state of Texas with some hybrids also in various national yield trials to determine the merits and weaknesses of each line for as many agronomic traits as possible. Following is a more complete description of each line:

A/BTx642 tested as B35, was originally selected from a BC_1F_2 population from the cooperative TAMU-TAES/USDA-ARS Sorghum Conversion Program at Chillicothe, Texas (Table 1). IS12555 (SC35) is a photoperiod sensitive durra from Ethiopia and is a restorer line in the A_1 cytoplasmic male-sterility system. Selection and evaluation in the

F_3 to the F_{10} generation that lead to the development of this line were made in one or more of the following locations; Lubbock Texas, and Mayaguez Puerto Rico. In the final generation of selection, 20 individual panicles of this line were self-pollinated and bulked to create the experimental line. Since that time, this line has been maintained by self-pollination. From 1991 to 2000, this line has been included in numerous replicated tests as an inbred line and in hybrid combination to determine the merits and weaknesses of the line for as many agronomic traits as possible.

A/BTx643 tested as A/B1 (this code does not designate sterility system), was originally selected from a F_2 population at Halfway, Texas (Table 1). Selection and evaluation in the F_3 to the F_{10} generation that lead to the development of this line were made in one or more of the following locations; Lubbock (L), Halfway (H), Beeville (B), Corpus Christi (CC) Texas, and Mayaguez and Isabella (P) Puerto Rico. In the final generation of selection, 20 individual panicles of this line were self-pollinated and bulked to create the experimental line. Since that time, this line has been maintained by self-pollination. From 1991 to 1999, this line has been included in numerous replicated tests as an inbred line and in hybrid combination to determine the merits and weaknesses of the line for as many agronomic traits as possible.

A/BTx644 tested as A/B803, was originally selected from a F_2 population at Halfway, Texas (Table 1). Selection and evaluation in the F_3 to the F_{10} generation that lead to the development of this line were made in one or more of the following locations; Lubbock (L), Beeville (B), Orange Grove (OG), Corpus Christi (CC), College Station (C) and Chillicothe (CV), Texas, and Mayaguez and Isabella (P) Puerto Rico. In the final generation of selection, 20 individual panicles of this line were self-pollinated and bulked to create the experimental line. Since that time, this line has been maintained by self-pollination. From 1992 to 1997, this line has been included in numerous replicated tests as an inbred line and in hybrid combination to determine the merits and weaknesses of the line for as many agronomic traits as possible.

A/BTx645 tested as A/B807, was originally selected from a F_2 population at Lubbock, Texas (Table 1). Selection and evaluation in the F_3 to the F_{10} generation that lead to the development of this line were made in one or more of the following locations; Lubbock (L), Beeville (B), Berclair (BH), Corpus Christi (CC), Orange Grove (OG) Texas, and Mayaguez and Isabella (P) Puerto Rico. In the final generation of selection, 20 individual panicles of this line were self-pollinated and bulked to create the experimental line. Since that time, this line has been maintained by self-pollination. From 1993 to 2000, this line has been included in numerous replicated tests as an inbred line and in hybrid combination to determine the merits and weaknesses of the line for as many agronomic traits as possible.

LINE DESCRIPTION AND PERFORMANCE (in hybrid combinations)

Any gene symbols used in the description of these lines are those recommended by Schertz and Stephens (1966). All of these parental lines are in the A_1 cytoplasmic genetic male sterility system (Stephens and Holland, 1954). The A-lines are 100% male sterile.

All four parental lines are three dwarf lines (*$dw_1Dw_2\,dw_3dw_4$*) and have no testa ($b_1b_1B_2B_2$). The lines are purple or purple-red plant color, with various pericarp color (Table 1). These lines were developed in the drought resistance breeding program of the Texas Agricultural Experiment Station and posses various combinations of pre and post-flowering drought resistance. These lines should prove useful in the development of drought and lodging resistant hybrids for commercial release. None of these lines have a pigmented testa. A brief description explaining why each line is proposed for release follows:

A/BTx642, tested as A/B35, is a lemon-yellow pericarp, purple colored plant. The panicle is semi-compact, erect, elliptic, 6-8" in length with a durra head type. Rachis branches are short, stiff. The grain is nearly round, only slightly pointed and partially covered with hairy glumes. It is slightly later and shorter in height to BTx378 and BTx623. It possesses excellent post-flowering drought tolerance (known as stay-green), charcoal rot resistance, and lodging resistance, and produces hybrids with excellent stay-green, charcoal rot resistance, and lodging resistance. In all hybrid combinations tested, the stay-green reaction expresses itself well in the F_1. The line, B35, is the best source of resistance to post-flowering drought (stay green) and has been used extensively in drought breeding programs around the world, and in molecular genetics research to identify stay green QTLs. The line and its hybrids possess excellent resistance to several different types of lodging: charcoal rot or moisture stress type lodging, weak neck peduncle breakage, and after-freeze stalk breakage. The line is susceptible to pre-flowering moisture stress, and is sometimes delayed in flowering under hot, moisture stress conditions. However, many of its hybrids possess a good combination of pre- and post-flowering drought tolerance. In most hybrid combinations with common white or red seeded males, it will produce a light red pericarp grain on the hybrid. It is resistant to head smut and head blight, but susceptible to downy mildew, anthracnose, most leaf diseases, and is tolerant to MDMV. The line expresses a physiological leaf spot reaction near maturity, but does not appear to affect performance. The line combines well with certain pollinators, such as RTx430, but does not perform well with certain other R-lines. Hybrids of ATx642 have produced above average yields, especially under limited irrigation or dryland, or when under late season drought conditions, but has somewhat reduced yield potential under high yield or fully irrigated conditions (Tables 2-5 and 6-7).

A/BTx643, tested as A/B1 (this code does not designate sterility system), is a white, translucent pericarp, and a purple-red colored plant. The panicle is semi-loose, long, and rectangular in shape. Rachis branches are moderately long and erect. The grain is slightly oval and slightly turtle shaped with glabrous glumes. It is slightly later than BTx378 in South Texas, but earlier in West Texas and similar in height to BTx378. It is similar in maturity but shorter than BTx623. Its hybrids tend to be later in relative maturity in South Texas and become earlier in the northern areas. It possesses good post-flowering drought tolerance, charcoal rot resistance, and lodging resistance. It also possesses moderate tolerance to pre-flowering drought stress. The stay-green in A1, however, is not as dominant as in ATx642 (A35) and in some combinations is completely recessive. Hybrids will vary in their expression of stay-green from very

good, to intermediate, to poor depending on the male parent. It is very susceptible to head smut and leaf blight, and susceptible to anthracnose. It should be used in hybrids only with males with good head smut resistance in areas of high head smut incidence. It is moderately resistant to downy mildew, tolerant to MDMV, and highly resistant to fusarium head blight. The line has excellent sterility (similar to ATx623) and has excellent general combining ability. It has moderate resistance to grain mold/weathering. Hybrids of A1 are shorter, more open-headed and more attractive in appearance than ATx623 hybrids. Depending upon the male parent, hybrids have produced above average yields, especially under dryland, limited moisture conditions, but also have good yield potential under high yield or fully irrigated conditions (Tables 2-5 and 8-9).

A/BTx644, tested as A/B803, is a light red (slightly orange tint) somewhat translucent pericarp, purple colored plant. The panicle is rectangular to slightly oval and long (8-12"), moderately open and somewhat drooping at maturity. The rachis branches are moderately long, not stiff. The grain is nearly round but slightly pointed with glabrous glumes. It is slightly earlier and shorter in height than BTx378 and BTx623. The line and its hybrids tend to be later in South Texas and get progressively earlier in more northern latitudes. It possesses excellent pre-flowering drought tolerance and a slight degree of stay-green with some lodging resistance. In most hybrid combinations, it will produce a light red pericarp grain. It is moderately resistant to head smut, and downy mildew, and most leaf diseases, and is tolerant to MDMV. The grain is rounder in shape and slightly smaller than grain of BTx643 and BTx645. The line combines well with many pollinators. Hybrids of ATx645 have produced above average yields under dryland conditions, but generally yield slightly less than ATx643 and ATx645 hybrids under higher yield potential conditions (Tables 2-5 and 10-11).

A/BTx645, tested as A/B807, is a dark red, translucent pericarp, purple-red colored plant. The panicle is rectangular to slightly oval and long (10-13") and semi-loose. The rachis branches are moderately long, erect, and not stiff. Glumes are slightly pointed and slightly hairy. The grain is moderately large, somewhat oval and pointed, and threshes easily and clean from the glumes. It is slightly earlier and shorter in height to A/BTx378 and BTx623. The line and its' hybrids tend to be later in South Texas and get progressively earlier in more northern latitudes. The dark red grain has a moderately high level of grain mold/weathering resistances that transfers well into the F_1 hybrids, resulting in attractive appearance and high test-weight grain. The panicle is moderately loose as are its' hybrids. The line and its' hybrids possess excellent pre-flowering drought tolerance, but with no stay-green, but does possess moderate lodging resistance. It is very susceptible to head smut, moderately resistant to downy mildew, tolerant to MDMV, and moderately resistant to leaf diseases. The line has excellent general combining ability. Hybrids of ATx645 have produced above average yields under a wide range of conditions (Tables 2-5 and 12-13).

ACKNOWLEDGEMENTS

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Stephens, J. C. and R. F. Holland. 1954. Cytoplasmic Male-Sterility for Hybrid Sorghum Seed Production. Agron. J. 46:20-23.

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Estimated Percent Contribution to the Development and Release of These New Parental Lines

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15% = C.A. Woodfin, Research Scientist, TAES, Lubbock
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Table 1. Designation, evaluation codes, grain and plant descriptor, and pedigrees of the sorghum breeding lines proposed for release.

Designation	Evaluation Code	Pericarp Color	Plant Color	Pedigree
A/BTx642	A/B35 L	Y	P	[(BTx406*IS12555(SC35)$_{F3}$)*IS12555]-6
A/BTx643	A/B 1	W	PR	(BTx625*B35)-HL19-HL9-B4-Bbk-P3-L3-P3-L2
A/BTx644	A/B803 R		P	(BTx3042*(BTx625*B35))-L3-B3-OG2-OGbk-P2-L3-P1-L1-P1
A/BTx645	A/B807 R		PR	(BTx623*(BTx625*B35))-37B-Bbk-BHbk-P3-L1-P2-L1-P1

LY =Lemon Yellow; W = White; R = Red; P = Purple; PR = Purplish-red
BTx406 is a 4-dwarf Martin derivative
BTx625, (BTx3197*SC170-6), is a later, shorter sister selection of BTx623
BTx3042 is an early Redbine
SC170-6 is a BC_1 selection from the conversion of IS12661, a Zerazera from Ethiopia

Table 2. Descriptive plant and grain characteristics of the sorghum breeding lines proposed for release.

Line desig-nation	Phenotypic pericarp color	Genetic pericarp color	Mesocarp thickness	Plant color	Glume color	Awns	Midrib	Glume coverage
BTx642	L emon-yellow, chalky	RrYY	thick	purple	lite-reddish purple	present	dry	40%
BTx643	White, pearly	RRyy	thin	red	red	absent	juicy	30%
BTx644	Red, rather pearly	RRYY	moderately thin	purple	purple	absent	juicy	35%
BTx645	Dark red, pearly	RRYY	thin	red	purple-red	absent	juicy	35%

Table 3. Agronomic characteristics of BTx642-BTx645 sorghum parental lines in various sites throughout Texas.

Location/ Destination		Days to anthesis	Plant height	Panicle exsertion	Agronomic* desirability rating	LPD** rating	Stalk lodging	Grain weight gms/1000
			in	in			%	
Lubbock B	Tx642	71	38	5	2.2	1.4	0	28.4
B	Tx643	65	36	1	2.0	1.7	5	30.1
B	Tx644	58	35	4	2.5	1.5	7	23.8
B	Tx645	62	40	3	2.2	2.2	13	30.4
B	Tx378	70	37	3	2.8	2.7	20	31.4
B	Tx623	64	40	2	2.6	2.8	50	30.6
Corpus B	Tx642	80	38	6	2.9	2.6	0	-
Christi B	Tx643	78	38	2	1.9	2.6	0	-
B	Tx644	78	36	5	1.9	2.7	2	-
B	Tx645	77	38	4	2.1	3.3	10	-
B	Tx378	75	39	5	2.4	3.2	15	-
B	Tx623	78	42	3	2.1	3.5	20	-

		Field 403		Field 407		
		LPD** rating	Lodging*** %	LPD** rating	Charcoal**** rot rating	Lodging*** %
Lubbock	BTx642	2.2 0		2.7 0.5		0
	BTx643	2.3 0		2.9 0.7		0
B	Tx378	4.9	53	--	--	--
B	Tx623	3.7	26	4.7	2.0	40
Tx	7000	--	--	4.6	3.4	13

*1 = very good to 5 = very poor;
** = Leaf and plant death rating: 1 = all green, 3 = 50% of leaf area dead, 5 = entire plant dead
***=Moisture stress type lodging
****=Inoculated stalk rated on 1-5 scale: <1 = < one internode infected, 3 = 3 internodes, 4 = >3 internodes, 5 = death, sclerotia
BTx642 = B35; BTx643 = B1; BTx644 = B803; BTx645 = B807

Table 4. Disease and other ratings of BTx642-645 sorghum parental lines in various sites throughout Texas.

Designation/ Location	Head Smut	Downy mildew	Anthracnose rating	Fusarium head blight rating	Chemical/ Insecticide burn rating	Pre-flowering drought rating	Post-flowering drought rating
	%	%					
BTx642							
CS			4.5				
CC 0		10			3.5	4.0	2.6
LU				1.0			
BTx643							
CS			4.0				
CC 25		0			1.0	2.5	2.6
LU				1.0			
BTx644							
CS			3.0				
CC 5		0			1.0	3.1	2.7
LU				2.5			
BTx645							
CS			4.0				
CC 15		0			1.0	2.1	3.3
LU				3.0			
BTx378							
CS			2.0				
CC 3		2			3.0	2.7	3.4
LU				3.5			
BTx623							
CS			4.0				
CC 30		0			1.0	3.3	3.5
LU				2.5			

CS= College Station; CC = Corpus Christi; LU = Lubbock
Disease and burn ratings 1 = resistant through 5 = death
Drought rating 1 = very good through 5 = very poor

Head smut – Pathotype 4 type
Downy mildew – Pathotype 1
Anthracnose – Inoculated
Pre-flowering drought rating – Corpus Christi, 2001
Post-flowering drought rating – Corpus Christi, 1998

Table 5. Agronomic performance of various hybrids of ATx642 (A35), ATx643 (A1), ATx644 (A803), and ATx645 (A807) hybrids from Lubbock and Halfway.

LP Hybrid/Pedigree	DL[1] rating	LP DL[1] rating	Lodging[2] percent (%)	Stress[3] rating	Charcoal[3] rot rating	Number[3] lodged plants
1993		1994	1994	2001	2001	2001
A35*Tx430 2.6		2.7	2	2.2	1.3	0
A1*Tx430 3.8		3.9	31	2.8	3.9	15
A35*Tx436 2.6		2.7	1	-	-	-
A1*Tx436 3.5		4.1	7	-	-	-
A35*BE2668 2.6		2.7	4	-	-	-
A1*BE2668 3.3		4.0	22	-	-	-
A803*BE2668 -		3.1	6	-	-	-
A807*BE2668 -		4.1	26	-	-	-
A35*86EON361 2.9		2.9	3	-	-	-
A1*86EON361 4.0		4.5	68	-	-	-
A35*P37-3 3.2		2.5	3	2.3	1.5	0
A1*P37-3 4.3		4.7	62	-	-	-
A35*89CC443 -		-	-	2.2	1.3	0
ATx399*Tx430 (check)	-	4.2	41	3.3	4.2	17
ATx2752*Tx430 (check)	-	4.0	27	2.8	3.6	13
ATx378*Tx430 (check)	-	4.3	55	-	-	-
DK 46 (check)	-	3.2	8	-	-	-

[1]Leaf and plant death rating: 1 = all green; 3 = 50% of leaf area dead; 5 = entire plant dead. Ratings are mean of Lubbock and Halfway.
[2]Primarily moisture stress type lodging, Lubbock
[3]Corpus Christi Charcoal Rot Test, 2001. Stress rating 1 – best resistance, 5 = very poor stress reaction; Charcoal rot rating (natural) 1 = no charcoal, 5 = 100% charcoal.

Table 6. Performance (% of checks) of hybrids using A35 (ATx642) as the female relative to the performance of 3 common checks, ATx399*RTx430, ATx378*RTx430, ATx2752*RTx430, and the overall test mean where the experimental hybrids and the checks were evaluated in the same enivironment.

	Yield of ATx642 hybrids relative to:			
Location Year	ATx399 * RTx430 %	ATx378 * RTx430 %	ATx2752 * RTx430 %	Test Mean %
Gregory 1994	88.9	79.8	79.4	90.0
Thrall 1993	102.8	108.0	108.6	110.0
Granger 1997	99.7	81.0	89.5	101.0
1998	86.4	77.2	92.3	97.1
1999	105.9	86.6	101.2	106.0
2000 106.8		94.1 97.1		103.9
Prosper 1998	79.1	87.6	118.6	100.7
2000	102.2	101.0	106.1	108.9
Lubbock 1993	111.7	100.4	92.7	112.7
1994	118.3	108.7	118.5	123.7
1997	112.8	122.0	109.0	97.0
1998 105.0		95.5 91.1		113.1
1999	78.9	63.8	72.2	66.4
Halfway 1994 152.7		.	.	.
Dryland				
Halfway 1997	152.3	166.6	159.5	136.9
1998	114.5	106.7	101.0	112.2
1999	101.1	109.2	109.7	128.4
2000	95.4	89.9	90.3	99.2
Dumas 2000	155.4	156.4	142.4	135.2
Average	108.9	101.9	104.4	107.9

Table 7. Agronomic performance data from replicated tests for hybrids using the female A35 (ATx642) and appropriate checks in 39 locations over various years.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Gregory[1]	1994 A	35*(430*9188)	82	50	13	56.5	4250g-n
		ATx399*RTx430	75	49	10	57.2	4779a-j
		ATx378*RTx430	76	59	10	57.2	5325a-c
		ATx2752*RTx430	75	53	9	56.3	5354a-b
						Test mean (62)	4720
						LSD(0.05)	633.7
Thrall[1]	1993 A	35*88BE2668	92	53	10	62.0	6556a-g
		A35*89CC443	94	53	10	63.3	6378a-j
		ATx399*RTx430	92	47	6	59.3	6291a-m
		ATx378*RTx430	93	54	5	60.5	5988a-o
		ATx2752*RTx430	93	50	5	61.6	5955a-o
						Test mean (66)	5901
						LSD(0.05)	775.5
Granger[1]	1997 A	35*88V1080	100	51	9	60.2	5948
		A35*89CC445	101	52	11	60.3	6067
		ATx399*RTx430	101	47	7	56.5	6025
		ATx378*RTx430	101	60	8	56.9	7421
		ATx2752*RTx430	101	54	6	59.4	6710
						Test mean (71)	5973
						LSD(0.05)	847.0
1998		A35*88V1080	87	45	6	58.8	4206
		A35*89CC445	85	45	6	59.2	5028
		ATx399*RTx430	84	42	4	57.0	5343
		ATx378*RTx430	86	48	3	58.4	5402
		ATx2752*RTx430	85	44	5	60.0	5001
						Test mean (72)	4755
						LSD(0.05)	879.0
1999		A35*89CC445	95	51	7	60.2	6182
		ATx399*RTx430	92	52	6	56.9	5837
		ATx378*RTx430	92	61	7	57.9	7074
		ATx2752*RTx430	93	51	4	58.0	6107
						Test mean (66)	5845
						LSD(0.05)	687.6
2000		A35*89CC445	85	56	9	61.0	5942
		ATx399*RTx430	85	51	5	59.0	5562
		ATx378*RTx430	85	59	5	59.5	6316
		ATx2752*RTx430	86	53	4	60.7	6121
						Test mean (45)	5721
						LSD(0.05)	636.9

Table 7. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Prosper[1]	1998 A	35*89CC445	85	41	4	57.1	2145
		ATx399*RTx430	84	41	3	54.9	2711
		ATx378*RTx430	86	45	1	54.2	2448
		ATx2752*RTx430	87	40	2	55.5	1809
					Test mean (63)		2130
						LSD(0.05)	830.0
2000		A35*89CC445	73	56	7	60.3	6472
		ATx399*RTx430	71	49	5	57.6	6334
		ATx378*RTx430	71	59	7	59.0	6411
		ATx2752*RTx430	73	50	4	58.9	6101
					Test mean (34)		5943
						LSD(0.05)	988.9
Lubbock[1] Irrigated	1993 A	35*89CC443	72	47	5	.	5643a-f
		ATx399*RTx430	71	42	4	.	5052a-k
		ATx378*RTx430	71	48	2	.	5621a-f
		ATx2752*RTx430	71	45	1	.	6087a-b
					Test mean (64)		5009
						LSD(0.05)	1187.0
1994		A35*89CC443	66	51	6	.	7336a-b
		ATx399*RTx430	58	42	2	.	6200c-l
		ATx378*RTx430	61	49	4	.	6751a-d
		ATx2752*RTx430	60	44	3	.	6190c-l
					Test mean (60)		5931
						LSD(0.05)	913.8
Lubbock 1997 Dryland		A35*RTx430	62	47	2.3	.	1522
		A35*89CC445	61	45	4.7	.	1561
		A35*88V1080	62	43	3.3	.	945
		ATx399*RTx430	60	38	0.0	.	1190
		ATx378*RTx430	57	43	4.0	.	1101
		ATx2752*RTx430	63	41	0.3	.	1232
					Test mean (51)		1384
						LSD(0.05)	744
1998		A35*RTx430	62	43	3	.	5456
		A35*89CC445	63	43	5	.	4724
		A35*88V1080	63	41	5	.	4716
		ATx399*RTx430	60	37	0	.	4730
		ATx378*RTx430	61	49	1	.	5200
		ATx2752*RTx430	61	41	0	.	5450
					Test mean (52)		4390
						LSD(0.05)	982.8

Table 7. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Lubbock[1]	1999 A	35*RTx430	54	35	1	.	1039
		A35*89CC445	57	35	0	.	889
		ATx399*RTx430	53	33	0	.	1222
		ATx378*RTx430	54	37	0	.	1511
		ATx2752*RTx430	53	35	0	.	1334
					Test mean (45)		1452
						LSD(0.05)	508.3
Halfway 1994		A35*RTx430	59	34	0	.	1943b-f
Dryland[1]	A	35*Tx2864	61	35	0	.	1838c-h
		A35*Tx2783	64	35	0	.	1736e-h
		ATx399*RTx430	65	32	0	.	1204h-i
					Test mean (60)		1915
						LSD(0.05)	546.0
Halfway[1]	1997 A	35*89CC445	63	45	6	.	5364
Irrigated		ATx399*RTx430	68	36	3	.	3522
		ATx378*RTx430	70	48	6	.	3219
		ATx2752*RTx430	67	44	5	.	3362
					Test mean (60)		3918
						LSD(0.05)	1207.0
1998		A35*89CC445	66	47	8	.	7833
		ATx399*RTx430	64	46	5	.	6844
		ATx378*RTx430	67	55	6	.	7340
		ATx2752*RTx430	67	46	3	.	7752
					Test mean (70)		6983
						LSD(0.05)	952.0
1999		A35*89CC445	62	51	14	.	4621
		ATx399*RTx430	62	50	8	.	4569
		ATx378*RTx430	61	57	9	.	4232
		ATx2752*RTx430	62	54	7	.	4214
					Test mean (56)		3599
						LSD(0.05)	965.5
2000		A35*89CC443	62	46	5	.	5389
		ATx399*RTx430	63	40	1	.	5650
		ATx378*RTx430	63	46	2	.	5993
		ATx2752*RTx430	67	43	4	.	5970
					Test mean (37)		5434
						LSD(0.05)	1069
Dumas[1]	2000 A	35*89CC443	70	52	7	59.0	6105
		ATx399*RTx430	71	47	4	54.2	3928
		ATx378*RTx430	71	52	5	55.4	3903
		ATx2752*RTx430	73	51	4	56.5	4287
					Test mean (24)		4517
						LSD(0.05)	1391

Table 7. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Colorado[2] (Walsh)	1991 A	35*RTx430	76	46	.	.	3372
		Martin B Line	79	42	.	.	2202
		RS626	68	41	.	.	2436
					Test mean (18)		2894
						LSD(0.05)	.
	1992	A35*RTx430	69 47		. 57.0		3466
		Martin B Line	70	45	.	56.0	3752
		RS626	69 43		. 56.0		3982
					Test mean (19)		3511
						LSD(0.05)	.
	1993	A35*RTx430	59 43		. 52.0		1338
		Martin B Line	62	36		51.0	1198
		RS626	57 40		. 52.0		851
					Test mean (13)		1269
						LSD(0.05)	.
	1994	A35*RTx430	80 42		. 58.0		5729
		Martin B Line	84	42	.	58.0	4805
		RS626	70 41		. 55.0		3382
					Test mean (14)		3715
						LSD(0.05)	.
Indiana[2] 1991 (W. Lafayette)		A35*RTx430	58	54	.	.	8443
		Martin B Line	57	46	.	.	5158
		RS626	55	49	.	.	6987
					Test mean (33)		7744
						LSD(0.05)	.
1992		A35*RTx430	85	52	.	.	9259
		Martin B Line	83	48	.	.	5316
		RS626	80	49	.	.	6228
					Test mean (40)		7679
						LSD(0.05)	.
	1993 A	35*RTx430	84	58	.	.	8534
		Martin B Line	76	52	.	.	5213
		RS626	75	52	.	.	6683
					Test mean (46)		6977
						LSD(0.05)	1102.0
1994		A35*RTx430	75	60	.	.	10439
		A35*88V1080/Tx430*R9188	77	55	.	.	10649
		ATx399*RTx430	74	56	.	.	9173
		ATx378*RTx430	77	69	.	.	11843
		RS610	74	60	.	.	7990
					Test mean (48)		9343
						LSD(0.05)	1037.0

Table 7. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Kansas[2] (Hays)	1991	A35*RTx430	67 41		. 60.1		6760
		ATx399*RTx430	70 36		. 57.9		5183
		ATx378*RTx430	71 39		. 59.0		5876
		RS626	61 36		. 58.8		6027
					Test mean (33)		5909
						LSD(0.05)	.
	1992	A35*RTx430	67 51		. 58.0		8177
		ATx399*RTx430	68 48		. 53.7		7778
		ATx378*RTx430	70 55		. 52.7		7067
		RS626	62 47		. 54.9		7313
					Test mean (60)		7311
						LSD(0.05)	633.0
	1993	A35*RTx430	68 50		. 60.6		7812
		ATx399*RTx430	72 49		. 59.6		8922
		ATx378*RTx430	74 56		. 59.9		9181
		RS626	67 46		. 58.3		6412
					Test mean (40)		7923
						LSD(0.05)	900.0
	1994	A35*RTx430	66 45		. 59.3		6702
		ATx399*RTx430	67 41		. 55.3		5711
		ATx378*RTx430	71 47		. 56.6		5576
		RS626	64 37		. 57.8		5035
					Test mean (48)		5998
						LSD(0.05)	.
Nebraska[2] (Mead)	1991 A	35*RTx430	66	52	.	.	7119
		ATx399*RTx430	68	44	.	.	5683
		ATx378*RTx430	68	52	.	.	4725
		RS626	66	44	.	.	3381
					Test mean (34)		5690
						LSD(0.05)	.
	1992 A	35*RTx430	86	55	.	.	7294
		ATx399*RTx430	91	49	.	.	7425
		ATx378*RTx430	93	61	.	.	6605
		RS626	83	52	.	.	3513
					Test mean (60)		5924
						LSD(0.05)	1267
	1993 A	35*RTx430	84	52	.	.	5227
		ATx399*RTx430	83	51	.	.	7293
		ATx378*RTx430	84	60	.	.	5616
		RS626	81	48	.	.	3159
					Test mean (49)		5111.4
						LSD(0.05)	.

Table 7. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Nebraska[2]	1994	A35*RTx430	70	51	.	.	7160
		ATx399*RTx430	71	49	.	.	7019
		ATx378*RTx430	71	57	.	.	8851
		RS626	69	47	.	.	6293
					Test mean (47)		6918
						LSD(0.05)	.
Oklahoma[2] (Perkins)	1991	A35*RTx430	61 33		. 51.3		1116
		ATx399*RTx430	60	28		53.0	995
		ATx378*RTx430	60 34		. 55.1		1131
		RS626	59 30		. 48.0		991
					Test mean (33)		1061
						LSD(0.05)	465
	1992	A35*RTx430	60 54		. 58.5		2512
		ATx399*RTx430	58 49		. 57.2		3502
		ATx378*RTx430	61 55		. 58.0		3571
		RS626	58 46		. 57.1		3157
					Test mean (38)		3252
						LSD(0.05)	1423
	1994	A35*RTx430	62 45		. 53.0		4034
		ATx399*RTx430	58 41		. 52.0		2489
		ATx378*RTx430	61	46	.	56	1576
		RS626	58 37		. 50.0		2311
					Test mean (33)		2585
						LSD(0.05)	1102.0

[1]Data compiled from "Grain Sorghum Performance Tests in Texas" from 1993-2000.
[2]Data compiled from "Regional Sorghum Yield Trials" from 1991-1994.

Table 8. Performance (% of checks) of hybrids using A1 (ATx643) as the female relative to the performance of 3 common checks, ATx399*RTx430, ATx378*RTx430, ATx2752*RTx430, and the overall test mean where the experimental hybrids and the checks were evaluated in the same enivironment.

	Yield of ATx643 hybrids relative to:			
Location Year	ATx399 * RTx430 %	ATx378 * RTx430 %	ATx2752 * RTx430 %	Test Mean %
Weslaco 1993	103.0	108.3	102.8	104.2
1994	102.2	90.0	99.7	99.3
1997	109.7	88.6	98.3	101.3
Gregory 1993	113.3	94.6	96.7	104.5
1997	114.7	85.2	94.4	99.8
Thrall 1993	103.0	108.2	108.8	109.8
Castroville 1994	111.4	99.2	102.7	106.9
1997	103.3	85.7	95.3	93.7
College 1994	123.7	102.8	104.7	122.0
Station 1998	108.8	103.8	96.9	106.6
1999	113.4	99.9	98.2	99.1
McKinney 1993	126.2	129.2	113.0	104.1
1994	90.8	92.4	109.5	98.9
Granger 1997	106.1	86.1	95.3	107.0
Prosper 1997	66.5	58.6	59.2	74.9
Lubbock 1993	81.2	73.0	67.4	81.9
1994	75.1	69.0	75.3	78.5
1997	101.1	109.3	97.6	86.9
1999	95.6	77.3	87.6	80.4
Halfway 1994	97.6	.	85.0	92.2
1997	122.7	134.2	128.5	110.3
1998	107.0	99.7	94.4	104.8
1999	68.0	73.4	73.7	86.3
Dumas 1993	87.9	80.7	79.4	85.6
Average	101.3	93.4	94.4	97.5

Table 9. Agronomic performance data from replicated tests for hybrids using the new female A1 (ATx643) and appropriate checks in 43 locations over various years.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Weslaco[1]	1993 A	1*88BE2668	80	49	8	59.2	6100a-m
		ATx399*RTx430	74	46	7	52.6	5923a-n
		ATx378*RTx430	75	50	4	53.1	5630b-o
		ATx2752*RTx430	74	44	5	54.7	5936a-n
						Test mean (88)	5853
						LSD (0.95)	857.2
1994		A1*88BE2668	78	48	7	59.5	5777b-m
		ATx399*RTx430	70	41	5	56.5	5653d-m
		ATx378*RTx430	74	50	8	57.0	6421a-e
		ATx2752*RTx430	71	49	10	56.8	5792b-m
						Test mean (75)	5816
						LSD (0.95)	725.2
1997		A1*88BE2668	87	49	8	60.8	6484
		ATx399*RTx430	80	48	10	58.4	5910
		ATx378*RTx430	82	56	9	59.9	7318
		ATx2752*RTx430	82	52	7	61.5	6597
						Test mean (83)	6403
						LSD (0.05)	691.35
Gregory[1]	1993 A	1*88BE2668	84 58		6	58.7	4895g-m
		ATx399*RTx430	82 52		8	57.2	4322p-q
		ATx378*RTx430	81	62	8	58.0	5173b-i
		ATx2752*RTx430	81	52	7	58.6	5117b-j
						Test mean (72)	4683
						LSD(0.05)	400.6
1997		A1*88BE2668	86	53	8	58.5	5478
		ATx399*RTx430	83	48	9	58.4	4778
		ATx378*RTx430	83	57	9	57.5	6432
		ATx2752*RTx430	82	52	8	59.9	5803
						Test mean (85)	5489
						LSD(0.05)	856.86
Thrall[1]	1993 A	1*88BE2668	92	51	6	61.4	6480a-h
		ATx399*RTx430	92	47	6	59.3	6291a-m
		ATx378*RTx430	93	54	5	60.5	5988a-o
		ATx2752*RTx430	93	50	5	61.6	5955a-o
						Test mean (66)	5901
						LSD(0.05)	775.5

Table 9. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Castroville[1]	1994 A	1*88BE2668	80 55		7	59.3	6761e-p
		A1*Tx2783	82	61	5	58.2	7851a-c
		ATx399*RTx430	78 55		9	57.1	6557g-q
		ATx378*RTx430	78	60	7	57.2	7364a-g
		ATx2752*RTx430	77	57	8	57.5	7111b-j
					Test mean (52)		6835
						LSD(0.05)	658.7
1997		A1*88BE2668	82	56	6	59.6	6886
		A1*Tx2783	83	61	4	60.1	7713
		ATx399*RTx430	81	56	5	57.5	7069
		ATx378*RTx430	81	62	6	60.2	8516
		ATx2752*RTx430	81	56	6	59.6	7659
					Test mean (54)		7731
						LSD(0.05)	988.68
College Station[1]	1994 A	A1*88BE2668	71	55	14	60.2	7321a-d
		1*Tx2783	73	58	13	59.8	7964a-b
		ATx399*RTx430	70	51	11	57.7	6180a-j
		ATx378*RTx430	69	60	11	57.3	7434a-c
		ATx2752*RTx430	69	55	11	58.8	7301a-e
					Test mean (55)		6266
						LSD(0.05)	1485.0
1998		A1*RTx2783	72	59	0	59.9	5376
		ATx399*RTx430	67	49	4	56.5	4940
		ATx378*RTx430	67	58	3	56.0	5180
		ATx2752*RTx430	65	49	4	56.5	5549
					Test mean (52)		5044
						LSD (0.05)	635.0
1999		A1*RTx2783	71	63	4	60.0	5941
		ATx399*RTx430	67	55	8	56.6	5238
		ATx378*RTx430	66	65	8	56.5	5946
		ATx2752*RTx430	67	58	6	58.0	6050
					Test mean (52)		5992
						LSD (0.05)	801.5
McKinney[1]	1993 A	1*88BE2668	84	55	5	56.6	5458a-g
		ATx399*RTx430	85	47	5	56.5	4326d-g
		ATx378*RTx430	88	53	4	53.9	4223e-g
		ATx2752*RTx430	84	46	2	56.8	4829b-g
					Test mean (48)		5241
						LSD(0.05)	1190.0

Table 9. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
McKinney[1]	1994 A	1*88BE2668	84	54	4	58.4	4780b-h
		A1*Tx2783	86	51	3	57.6	4025b-i
		ATx399*RTx430	84	42	4	56.5	4846b-g
		ATx378*RTx430	83	50	4	56.7	4763b-h
		ATx2752*RTx430	84	46	3	56.9	4019c-i
						Test mean (60)	4450
						LSD(0.05)	978.1
Granger[1]	1997 A	1*88BE2668	102	54	7	61.4	6392
		ATx399*RTx430	101	47	7	56.5	6025
		ATx378*RTx430	101	60	8	56.9	7421
		ATx2752*RTx430	101	54	6	59.4	6710
						Test mean (71)	5973
						LSD(0.05)	847.0
Prosper[1]	1997 A	1*88BE2668	110	48	5	56.7	2044
		ATx399*RTx430	108	45	6	58.5	3073
		ATx378*RTx430	107	49	5	55.8	3488
		ATx2752*RTx430	108	47	4	59.7	3450
						Test mean (66)	2728
						LSD(0.05)	1032.0
Lubbock[1] Irrigated	1993 A	1*88BE2668	67	45	4	.	3773j-m
		A1*Tx2783	71	47	1	.	4336e-l
		A1*RTx430	64	47	4	.	4193f-l
		ATx399*RTx430	71	42	4	.	5052a-k
		ATx378*RTx430	71	48	2	.	5621a-f
		ATx2752*RTx430	71	45	1	.	6087a-b
						Test mean (64)	5009
						LSD(0.05)	1187.0
1994		A1*88BE2668	58	46	4	.	4658s-t
		ATx399*RTx430	58	42	2	.	6200c-l
		ATx378*RTx430	61	49	4	.	6751a-d
		ATx2752*RTx430	60	44	3	.	6190c-l
						Test mean (60)	5931
						LSD(0.05)	913.8
Lubbock 1997 Dryland		A1*RTx430	59	38	1.3	.	1203
		ATx399*RTx430	60	38	0.0	.	1190
		ATx378*RTx430	57	43	4.0	.	1101
		ATx2752*RTx430	63	41	0.3	.	1232
						Test mean (51)	1384
						LSD(0.05)	744

Table 9. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Lubbock[1]	1999 A	1*RTx430	56	36	0	.	1168
		ATx399*RTx430	53	33	0	.	1222
		ATx378*RTx430	54	37	0	.	1511
		ATx2752*RTx430	53	35	0	.	1334
					Test mean (45)		1452
						LSD(0.05)	508.3
Halfway[1] Irrigated	1994 A	1*88BE2668	58	55	5	.	6611c-d
		A1*Tx2783	60	62	4	.	8029a-c
		A1*Tx2864	59	54	4	.	7582b-c
		ATx399*RTx430	58	53	4	.	7593b-c
		ATx2752*RTx430	59	61	5	.	8713a-b
					Test mean (60)		8032
						LSD(0.05)	1472.7
1997		A1*88BE2668	67	49	6	.	3493
		A1*RTx430	64	42	2	.	5149
		ATx399*RTx430	68	36	3	.	3522
		ATx378*RTx430	70	48	6	.	3219
		ATx2752*RTx430	67	44	5	.	3362
					Test mean (60)		3918
						LSD(0.05)	1207.0
1998		A1*88BE2668	66	49	6	.	6913
		A1*RTx430	66	51	5	.	7728
		ATx399*RTx430	64	46	5	.	6844
		ATx378*RTx430	67	55	6	.	7340
		ATx2752*RTx430	67	46	3	.	7752
					Test mean (70)		6983
						LSD(0.05)	952.0
1999		A1*RTx2783	64	56	4	.	2071
		A1*RTx430	61	56	7	.	4139
		ATx399*RTx430	62	50	8	.	4569
		ATx378*RTx430	61	57	9	.	4232
		ATx2752*RTx430	62	54	7	.	4214
					Test mean (56)		3599
						LSD(0.05)	965.5
Dumas[1] Irrigated	1993 A	1*88BE2668	68	47	6	62.2	6253p-r
		ATx399*RTx430	68	46	7	61.1	7115f-r
		ATx378*RTx430	69	54	5	62.0	7747a-n
		ATx2752*RTx430	69	47	5	62.2	7874a-l
					Test mean (80)		7308
						LSD(0.05)	1045.5

Table 9. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Colorado[2] (Walsh)	1991 A	1*RTx430	77	49	.	.	2293
		A1*R8503	79	48	.	.	3223
		A1*R8505	84	47	.	.	2723
		A1*Tx2737	75	48	.	.	3010
		A1*Tx2794	76	48	.	.	2631
		Martin B Line	79	42	.	.	2202
		RS626	68	41	.	.	2436
					Test mean (18)		2894
					LSD(0.05)		.
	1992	A1*RTx430	73 45		. 54.0		3405
		A1*R8505	82 47		. 51.0		2206
		A1*R8503	72 44		. 53.0		3573
		A1*Tx2783	77 52		. 52.0		2632
		A1*Tx2737	69 45		. 57.0		4211
		A1*Tx2794	69 45		. 57.0		3360
		Martin B Line	70	45	.	56.0	3752
		RS626	69 43		. 56.0		3982
					Test mean (19)		3511
					LSD(0.05)		.
	1993	A1*RTx430	57 41		. 51.0		1333
		A1*Tx2783	62 46		. 52.0		1316
		A1*R8503	57 45		. 52.0		1490
		Martin B Line	62	36	.	51.0	1198
		RS626	57 40		. 52.0		851
					Test mean (13)		1269
					LSD(0.05)		.
	1994	A1*RTx430	76 46		. 58.0		5729
		A1*R8503	77 46		. 56.0		3797
		A1*P37-3	83 48		. 55.0		3545
		Martin B Line	84	42	.	58.0	4805
		RS626	70 41		. 55.0		3382
					Test mean (14)		3715
					LSD(0.05)		.
Indiana[2] 1991 (W. Lafayette)		A1*RTx430	60	56	.	.	8507
		A1*R8503	58	55	.	.	7860
		A1*R8505	62	54	.	.	8526
		A1*Tx2737	57	54	.	.	7792
		A1*Tx2794	57	54	.	.	7392
		Martin B Line	57	46	.	.	5158
		RS626	55	49	.	.	6987
					Test mean (33)		7744
					LSD(0.05)		.

Table 9. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Indiana[2]	1992	A1*RTx430	87	49	.	.	7795
		A1*R8505	91	53	.	.	8219
		A1*R8503	89	50	.	.	8638
		A1*Tx2783	89	54	.	.	8413
		A1*Tx2737	83	49	.	.	8035
		A1*Tx2794	83	49	.	.	7231
		Martin B Line	83	48	.	.	5316
		RS626	80	49	.	.	6228
					Test mean (40)		7679
						LSD(0.05)	.
	1993 A	1*RTx430	84	59	.	.	7395
		A1*Tx2783	86	60	.	.	8880
		A1*R8503	87	56	.	.	8866
		Martin B Line	76	52	.	.	5213
		RS626	75	52	.	.	6683
					Test mean (46)		6977
						LSD(0.05)	1102.0
1994		A1*RTx430	77	61	.	.	9265
		A1*88BE2668	78	58	.	.	9613
		A1*R8503	77	57	.	.	9830
		A1*P37-3	75	56	.	.	9419
		ATx399*RTx430	74	56	.	.	9173
		ATx378*RTx430	77	69	.	.	11843
		RS610	74	60	.	.	7990
					Test mean (48)		9343
						LSD(0.05)	1037.0
Kansas[2] (Hays)	1991	A1*RTx430	66	42	.	57.9	6787
		A1*R8503	67	40	.	60.1	5038
		A1*R8505	70	41	.	60.3	6207
		A1*Tx2737	64	40	.	59.6	6675
		A1*Tx2794	65	42	.	60.1	5570
		ATx399*RTx430	70	36	.	57.9	5183
		ATx378*RTx430	71	39	.	59.0	5876
		RS626	61	36	.	58.8	6027
					Test mean (33)		5909
						LSD(0.05)	.
	1992	A1*RTx430	67	49	.	54.1	7912
		A1*R8505	70	54	.	56.4	7481
		A1*R8503	68	49	.	56.9	7252
		A1*Tx2783	69	56	.	58.0	7751
		A1*Tx2737	67	52	.	57.4	7677
		A1*Tx2794	67	49	.	54.7	7110
		ATx399*RTx430	68	48	.	53.7	7778
		ATx378*RTx430	70	55	.	52.7	7067
		RS626	62	47	.	54.9	7313
					Test mean (60)		7311
						LSD(0.05)	633.0

Table 9. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Kansas[2]	1993	A1*RTx430	71 51		. 60.1		8668
		A1*Tx2783	71 55		. 61.1		9067
		A1*R8503	69 52		. 60.8		8252
		A1*88BE2668	69 51		. 61.4		8002
		ATx399*RTx430	72 49		. 59.6		8922
		ATx378*RTx430	74 56		. 59.9		9181
		RS626	67 46		. 58.3		6412
					Test mean (40)		7923
						LSD(0.05)	900.0
	1994	A1*RTx430	66 45		. 56.4		4728
		A1*88BE2668	67 46		. 59.8		6606
		A1*R8503	66 47		. 58.6		6243
		A1*P37-3	68 47		. 56.8		5420
		ATx399*RTx430	67 41		. 55.3		5711
		ATx378*RTx430	71 47		. 56.6		5576
		RS626	64 37		. 57.8		5035
					Test mean (48)		5998
						LSD(0.05)	.
Nebraska[2] (Mead)	1991 A	1*RTx430	66	50	.	.	6236
		A1*R8503	66	51	.	.	7027
		A1*R8505	68	50	.	.	6495
		A1*Tx2737	66	49	.	.	7005
		A1*Tx2794	66	49	.	.	6672
		ATx399*RTx430	68	44	.	.	5683
		ATx378*RTx430	68	52	.	.	4725
		RS626	66	44	.	.	3381
					Test mean (34)		5690
						LSD(0.05)	.
	1992 A	1*RTx430	86	51	.	.	7731
		A1*R8505	95	56	.	.	6370
		A1*R8503	88	52	.	.	7862
		A1*Tx2783	90	54	.	.	7684
		A1*Tx2737	86	53	.	.	6867
		A1*Tx2794	85	53	.	.	6803
		ATx399*RTx430	91	49	.	.	7425
		ATx378*RTx430	93	61	.	.	6605
		RS626	83	52	.	.	3513
					Test mean (60)		5924
						LSD(0.05)	1267

Table 9. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Nebraska[2]	1993 A	1*RTx430	83	51	.	.	6403
		A1*Tx2783	84	55	.	.	7136
		A1*R8503	83	53	.	.	6853
		A1*88BE2668	83	51	.	.	7259
		ATx399*RTx430	83	51	.	.	7293
		ATx378*RTx430	84	60	.	.	5616
		RS626	81	48	.	.	3159
						Test mean (49)	5111.4
						LSD(0.05)	.
1994		A1*RTx430	72	52	.	.	7417
		A1*88BE2668	71	49	.	.	8353
		A1*R8503	70	49	.	.	8031
		A1*P37-3	69	52	.	.	6542
		ATx399*RTx430	71	49	.	.	7019
		ATx378*RTx430	71	57	.	.	8851
		RS626	69	47	.	.	6293
						Test mean (47)	6918
						LSD(0.05)	.
Oklahoma[2] (Perkins)	1991	A1*RTx430	59	34	.	45.3	1155
		A1*R8503	60	34	.	51.6	1194
		A1*R8505	62	33	.	52.0	908
		A1*Tx2737	61	32	.	49.3	949
		A1*Tx2794	57	34	.	47.4	1004
		ATx399*RTx430	60	28	.	53.0	995
		ATx378*RTx430	60	34	.	55.1	1131
		RS626	59	30	.	48.0	991
						Test mean (33)	1061
						LSD(0.05)	465
	1992	A1*RTx430	63	53	.	59.2	4000
		A1*R8505	60	55	.	60.7	3653
		A1*R8503	60	54	.	58.5	3049
		A1*Tx2783	64	58	.	60.7	2973
		A1*Tx2737	60	51	.	59.1	2746
		A1*Tx2794	61	54	.	59.4	3255
		ATx399*RTx430	58	49	.	57.2	3502
		ATx378*RTx430	61	55	.	58.0	3571
		RS626	58	46	.	57.1	3157
						Test mean (38)	3252
						LSD(0.05)	1423

Table 9. Con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Oklahoma[2]	1994	A1*RTx430	61 43		. 49.0		2630
		A1*88BE2668	62 44		. 57.0		2577
		A1*R8503	60 42		. 53.0		2151
		A1*P37-3	60 48		. 51.0		3381
		ATx399*RTx430	58 41		. 52.0		2489
		ATx378*RTx430	61	46	.	56	1576
		RS626	58 37		. 50.0		2311
					Test mean (33)		2585
						LSD(0.05)	1102.0

[1]Data compiled from "Grain Sorghum Performance Tests in Texas" from 1993-2000.
[2]Data compiled from "Regional Sorghum Yield Trials" from 1991-1994.

Table 10. Performance (% of checks) of hybrids using A803 (ATx644) as the female relative to the performance of 3 common checks, ATx399*RTx430, ATx378*RTx430, ATx2752*RTx430, and the overall test mean where the experimental hybrids and the checks were evaluated in the same enivironment.

	Yield of ATx644 hybrids relative to:			
Location Year	ATx399 * RTx430 %	ATx378 * RTx430 %	ATx2752 * RTx430 %	Test Mean %
Gregory 1993	90.0	75.2	76.0	83.1
1997	117.1	87.0	96.4	101.9
Danenang 1993	94.9	88.7	86.2	88.4
McKinney 1993	137.2	140.6	122.9	113.3
1994	84.6	86.1	102.0	92.1
College Station 1994	96.0	79.8	82.3	94.7
Lubbock 1997	111.2	120.2	107.4	95.6
Average	104.4	96.8	96.2	95.6

Table 11. Agronomic performance data from replicated tests for hybrids using the female A803 (ATx644) and appropriate checks in 19 locations over various years.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Gregory[1]	1993 A	803*88BE2668	85	54	10	59.8	3891r
		ATx399*RTx430	83	52	8	57.2	4322p-q
		ATx378*RTx430	81	62	8	58.0	5173b-i
		ATx2752*RTx430	81	52	7	58.6	5117b-j
						Test mean (72)	4683
						LSD(0.05)	400.6
1997		A803*88BE2668	86	56	10	60.3	5596
		ATx399*RTx430	83	48	9	58.4	4778
		ATx378*RTx430	83	57	9	57.5	6432
		ATx2752*RTx430	82	52	8	59.9	5803
						Test mean (85)	5489
						LSD(0.05)	856.86
Danenang[1]	1993 A	803*88BE2668	74	53	10	60.7	4901g-l
		ATx399*RTx430	70	54	7	56.9	5167d-l
		ATx378*RTx430	72	63	7	57.0	5523a-k
		ATx2752*RTx430	72	53	6	60.0	5687a-k
						Test mean (52)	5547
						LSD (0.05)	949.1
McKinney[1]	1993 A	803*88BE2668	84	51	8	58.2	5936a-c
		ATx399*RTx430	85	47	5	56.5	4326d-g
		ATx378*RTx430	88	53	4	53.9	4223e-g
		ATx2752*RTx430	84	46	2	56.8	4829b-g
						Test mean (48)	5241
						LSD(0.05)	1190.0
1994		A803*88BE2668	85	49	6	58.8	4099b-I
		ATx399*RTx430	84	42	4	56.5	4846b-g
		ATx378*RTx430	83	50	4	56.1	4763b-h
		ATx2752*RTx430	84	46	3	56.9	4019c-I
						Test mean (60)	4450
						LSD(0.05)	978.1
College 1994		A803*88BE2668	72	53	13	59.6	5933c-k
Station[1]	A	Tx399*RTx430	70	51	11	57.7	6180a-j
		ATx378*RTx430	69	60	11	57.3	7434a-c
		ATx2752*RTx430	69	55	11	58.8	7301a-e
						Test mean (55)	6266
						LSD (0.05)	1485.0

Table 11.con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Lubbock[1] Dryland	1997 A	803*88BE2668	56	42	3	.	1323
		ATx399*RTx430	60	38	0.0	.	1190
		ATx378*RTx430	57	43	4.0	.	1101
		ATx2752*RTx430	63	41	0.3	.	1232
					Test mean (51)		1384
					LSD(0.05)		744
Colorado[2] (Walsh)	1992	A803*RTx430	68 44		. 58.0		4850
		Martin B Line	70	45	.	56.0	3752
		RS626	69 43		. 56.0		3982
					Test mean (19)		3511
					LSD(0.05)		.
	1993	A803*R3224	63 39		. 51.0		1042
		Martin B Line	62	36		51.0	1198
		RS626	57 40		. 52.0		851
					Test mean (13)		1269
					LSD(0.05)		.
	1994	A803*88BE2668	76 40		. 59.0		3248
		Martin B Line	84	42	.	58.0	4805
		RS626	70 41		. 55.0		3382
					Test mean (14)		3715
					LSD(0.05)		.
Indiana[2] 1992 (W. Layafette)		A803*RTx430	83	47	.	.	7262
		Martin B Line	83	48	.	.	5316
		RS626	80	49	.	.	6228
					Test mean (40)		7679
					LSD(0.05)		.
	1993 A	803*R3224	88	50	.	.	5358
		Martin B Line	76	52	.	.	5213
		RS626	75	52	.	.	6683
					Test mean (46)		6977
					LSD(0.05)		1102.0
1994		A803*88BE2668	79	54	.	.	7838
		ATx399*RTx430	74	56	.	.	9173
		ATx378*RTx430	77	69	.	.	11843
		RS610	74	60	.	.	7990
					Test mean (48)		9343
					LSD(0.05)		1037.0
Kansas[2] (Hays)	1992	A803*RTx430	67 48		. 56.0		7867
		ATx399*RTx430	68 48		. 53.7		7778
		ATx378*RTx430	70 55		. 52.7		7067
		RS626	62 47		. 54.9		7313
					Test mean (60)		7311
					LSD(0.05)		633.0

Table 11.con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Kansas[2]	1994	A803*88BE2668	67 47		. 61.0		7067
		ATx399*RTx430	67 41		. 55.3		5711
		ATx378*RTx430	71 47		. 56.6		5576
		RS626	64 37		. 57.8		5035
					Test mean (48)		5998
						LSD(0.05)	.
Nebraska[2] (Mead)	1992 A	803*RTx430	83	50	.	.	6814
		ATx399*RTx430	91	49	.	.	7425
		ATx378*RTx430	93	61	.	.	6605
		RS626	83	52	.	.	3513
					Test mean (60)		5924
						LSD(0.05)	1267
1994		A803*88BE2668	72	46	.	.	6548
		ATx399*RTx430	71	49	.	.	7019
		ATx378*RTx430	71	57	.	.	8851
		RS626	69	47	.	.	6293
					Test mean (47)		6918
						LSD(0.05)	.
Oklahoma[2] (Perkins)	1992	A803*RTx430	59 53		. 58.7		3707
		ATx399*RTx430	58 49		. 57.2		3502
		ATx378*RTx430	61 55		. 58.0		3571
		RS626	58 46		. 57.1		3157
					Test mean (38)		3252
						LSD(0.05)	1423
	1994	A803*88BE2668	61 47		. 56.0		2863
		ATx399*RTx430	58 41		. 52.0		2489
		ATx378*RTx430	61	46	.	56	1576
		RS626	58 37		. 50.0		2311
					Test mean (33)		2585
						LSD(0.05)	1102.0

[1]Data compiled from "Grain Sorghum Performance Tests in Texas" from 1993-2000.
[2]Data compiled from "Regional Sorghum Yield Trials" from 1992-1994.

Table 12. Performance (% of checks) of hybrids using A807 (ATx645) as the female relative to the performance of 3 common checks, ATx399*RTx430, ATx378*RTx430, and ATx2752*RTx430 and the overall test mean where the experimental hybrids and the checks were evaluated in the same enivironment.

	Yield of ATx645 hybrids relative to:			
Location Year	ATx399 * RTx430 %	ATx378 * RTx430 %	ATx2752 * RTx430 %	Test Mean %
Weslaco 1993	100.1	106.2	100.7	102.1
1997	118.2	95.5	105.9	109.1
1998	108.1	85.0	95.4	98.0
1999	103.2	103.3	103.4	104.8
Gregory 1993	114.2	95.4	96.5	105.4
1997	121.2	90.0	99.8	105.5
1999	107.0	98.4	95.6	105.2
2000	111.2	100.2	103.9	99.7
Thrall 1993	97.2	102.1	102.6	103.6
Granger 1997	110.6	89.8	99.3	111.5
1998	91.8	90.8	98.0	103.1
1999	109.6	90.5	104.8	109.5
McKinney 1993	129.3	132.5	115.8	106.7
Prosper 1997	68.9	60.7	61.4	77.6
1998	79.0	87.5	118.4	100.5
1999	103.3	90.5	97.5	109.0
Lubbock 1993	70.3	63.2	58.4	70.9
1997	91.6	99.0	88.5	78.8
1998	95.2	86.6	82.6	102.6
Halfway 1993	105.5	.	95.1	105.3
1997	119.7	131.0	125.4	107.6
1998	107.3	100.0	94.7	105.1
1999	87.1	94.1	94.5	110.6
Dumas 1997	108.9	94.2	99.3	102.4
1998	98.8	92.5	86.8	101.7
1999	97.6	88.8	91.3	102.6
Average	102.1	94.7	96.6	101.5

Table 13. Agronomic performance data from replicated tests for hybrids using the new female A807 (ATx645) and appropriate checks in 35 locations over various years.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Weslaco[1]	1993 A	807*R8503 (Tx2908)	78	49	7	57.8	6498a-e
		A807*88BE2668	79	52	10	57.9	6101a-m
		A807*R3224	76	47	5	54.3	5334g-p
		ATx399*RTx430	74	46	7	52.6	5923a-n
		ATx378*RTx430	75	50	4	53.1	5630b-o
		ATx2752*RTx430	74	44	5	54.7	5936a-n
						Test mean (88)	5853
						LSD (0.95)	857.2
1997		A807*Tx2908	86	48	8	60.6	7028
		A807*88BE2668	86	52	8	60.2	7266
		A807*Tx2783	87	50	8	60.3	6670
		ATx399*RTx430	80	48	10	58.4	5910
		ATx378*RTx430	82	56	9	59.9	7318
		ATx2752*RTx430	82	52	7	61.5	6597
						Test mean (83)	6403
						LSD (0.05)	691.4
1998		A807*88BE2668	78	42	6	60.8	7131
		ATx399*RTx430	71	48	4	58.9	6597
		ATx378*RTx430	75	54	5	60.0	8392
		ATx2752*RTx430	75	47	4	60.9	7472
						Test mean (96)	7280
						LSD (0.05)	941.2
1999		A807*88BE2668	68	60	13	.	6954
		A807*LG35	67	54	9	.	6799
		ATx399*RTx430	62	49	10	.	6661
		ATx378*RTx430	63	56	10	.	6654
		ATx2752*RTx430	64	54	8	.	6650
						Test mean (50)	6560
						LSD (0.05)	634.0
Gregory[1]	1993 A	807*R8503 (Tx2908)	84	53	7	57.8	5258b-g
		A807*88BE2668	83	57	12	59.1	5207b-h
		A807*R3224	81	53	7	57.3	4346o-q
		ATx399*RTx430	83	52	8	57.2	4322p-q
		ATx378*RTx430	81	62	8	58.0	5173b-i
		ATx2752*RTx430	81	52	7	58.6	5117b-j
						Test mean (72)	4683
						LSD(0.05)	400.6

Table 13.con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Gregory[1]	1997 A	807*R8503 (Tx2908)	90	51	10	56.7	5909
		A807*88BE2668	86	54	10	59.1	5607
		A807*Tx2783	87	51	8	59.6	5854
		ATx399*RTx430	83	48	9	58.4	4778
		ATx378*RTx430	83	57	9	57.5	6432
		ATx2752*RTx430	82	52	8	59.9	5803
						Test mean (85)	5489
						LSD(0.05)	856.9
1999		A807*88BE2668	75	51	8	60.4	5998
		ATx399*RTx430	73	48	9	54.8	5608
		ATx378*RTx430	71	55	8	55.2	6098
		ATx2752*RTx430	72	51	8	57.5	6272
						Test mean (62)	5704
						LSD(0.05)	633.3
2000		A807*88BE2668	78	48	6	59.9	4682
		ATx399*RTx430	72	45	5	58.3	4212
		ATx378*RTx430	71	51	5	59.6	4673
		ATx2752*RTx430	71	46	5	59.9	4505
						Test mean (35)	4696
						LSD(0.05)	704.6
Thrall[1]	1993 A	807*(430*9188)	90	50	9	59.1	5663d-o
		A807*88BE2668	93	50	9	61.6	6561a-f
		ATx399*RTx430	92	47	6	59.3	6291a-m
		ATx378*RTx430	93	54	5	60.5	5988a-o
		ATx2752*RTx430	93	50	5	61.6	5955a-o
						Test mean (66)	5901
						LSD(0.05)	775.5
Granger[1]	1997 A	807*88BE2668	101	56	9	56.8	6661
		ATx399*RTx430	101	47	7	56.5	6025
		ATx378*RTx430	101	60	8	56.9	7421
		ATx2752*RTx430	101	54	6	59.4	6710
						Test mean (71)	5973
						LSD(0.05)	847.0
1998		A807*88BE2668	84	45	5	60.3	4903
		ATx399*RTx430	84	42	4	57.0	5343
		ATx378*RTx430	86	48	3	58.4	5402
		ATx2752*RTx430	85	44	5	60.0	5001
						Test mean (72)	4755
						LSD(0.05)	879.0
1999		A807*60B124	94	57	6	59.7	6400
		ATx399*RTx430	92	52	6	56.9	5837
		ATx378*RTx430	92	61	7	57.9	7074
		ATx2752*RTx430	93	51	4	58.0	6107
						Test mean (66)	5845
						LSD(0.05)	687.6

Table 13.con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
McKinney[1]	1993 A	807*88BE2668	82	52	6	57.8	5594a-f
		ATx399*RTx430	85	47	5	56.5	4326d-g
		ATx378*RTx430	88	53	4	53.9	4223e-g
		ATx2752*RTx430	84	46	2	56.8	4829b-g
						Test mean (48)	5241
						LSD(0.05)	1190.0
Prosper[1]	1997 A	807*R8503 (Tx2908)	109	45	4	58.5	2529
		A807*88BE2668	110	47	5	56.7	1706
		ATx399*RTx430	108	45	6	58.5	3073
		ATx378*RTx430	107	49	5	55.8	3488
		ATx2752*RTx430	108	47	4	59.7	3450
						Test mean (66)	2728
						LSD(0.05)	1032.0
1998		A807*R8503 (Tx2908)	86	42	2	56.8	2141
		ATx399*RTx430	84	41	3	54.9	2711
		ATx378*RTx430	86	45	1	54.2	2448
		ATx2752*RTx430	87	40	2	55.5	1809
						Test mean (63)	2130
						LSD(0.05)	830.0
1999		A807*60B124	75	52	6	59.1	6810
		A807*5BRON139	77	48	3	58.4	6564
		ATx399*RTx430	76	48	4	57.2	6472
		ATx378*RTx430	77	56	4	58.6	7386
		ATx2752*RTx430	77	49	3	58.9	6856
						Test mean (55)	6136
						LSD(0.05)	747.5
Lubbock[1] Irrigated	1993 A	807*R8503 (Tx2908)	63	40	4	.	2637m
		A807*88BE2668	68	47	7	.	4467c-l
		ATx399*RTx430	71	42	4	.	5052a-k
		ATx378*RTx430	71	48	2	.	5621a-f
		ATx2752*RTx430	71	45	1	.	6087a-b
						Test mean (64)	5009
						LSD(0.05)	1187.0
Dryland 1997		A807*R8503 (Tx2908)	53	43	0.7	.	983
		A807*88BE2668	56	38	2.7	.	1197
		ATx399*RTx430	60	38	0.0	.	1190
		ATx378*RTx430	57	43	4.0	.	1101
		ATx2752*RTx430	63	41	0.3	.	1232
						Test mean (51)	1384
						LSD(0.05)	744.0

Table 13.con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Lubbock[1]	1998 A	807*88BE2668	61	41	1	.	4504
		ATx399*RTx430	60	37	0	.	4730
		ATx378*RTx430	61	49	1	.	5200
		ATx2752*RTx430	61	41	0	.	5450
					Test mean (52)		4390
						LSD(0.05)	982.8
Halfway[1] Irrigated	1993 A	807*88BE2668	61	56	8	.	9071b-f
		ATx399*RTx430	61	54	5	.	8595d-h
		ATx2752*RTx430	63	57	4	.	9536b-c
					Test mean (36)		8611
						LSD(0.05)	705.0
1997		A807*Tx2783	63	42	3	.	4303
		A807*88BE2668	62	47	6	.	4130
		ATx399*RTx430	68	36	3	.	3522
		ATx378*RTx430	70	48	6	.	3219
		ATx2752*RTx430	67	44	5	.	3362
					Test mean (60)		3918
						LSD(0.05)	1207.0
1998		A807*Tx2783	64	55	5	.	8052
		A807*88BE2668	64	50	8	.	6633
		ATx399*RTx430	64	46	5	.	6844
		ATx378*RTx430	67	55	6	.	7340
		ATx2752*RTx430	67	46	3	.	7752
					Test mean (70)		6983
						LSD(0.05)	952.0
1999		A807*Tx2783	61	55	11	.	2843
		A807*88BE2668	61	51	11	.	5120
		ATx399*RTx430	62	50	8	.	4569
		ATx378*RTx430	61	57	9	.	4232
		ATx2752*RTx430	62	54	7	.	4214
					Test mean (56)		3599
						LSD(0.05)	965.5
Dumas[1] Irrigated	1997 A	807*88BE2668	68	48	8	59.8	7434
		ATx399*RTx430	70	46	8	59.6	6824
		ATx378*RTx430	71	50	7	58.5	7893
		ATx2752*RTx430	71	48	7	57.5	7487
					Test mean (79)		7262.4
						LSD(0.05)	1015.8
1998		A807*Tx2783	71	60	8	60.1	8032
		ATx399*RTx430	78	59	8	57.3	8129
		ATx378*RTx430	80	66	8	56.0	8687
		ATx2752*RTx430	79	54	7	58.9	9249
					Test mean (80)		7894
						LSD(0.05)	1135.0

Table 13.con'd.

Location	Year	Hybrid	Days to anthesis	Plant height (cm)	Exsertion (cm)	Test weight (lbs/bu)	Grain yield (lbs/acre)
Dumas[1]	1999 A	807*Tx2783	62	62	8	60.6	8225
		ATx399*RTx430	62	55	8	58.6	8428
		ATx378*RTx430	64	69	9	60.5	9262
		ATx2752*RTx430	66	61	7	60.2	9007
					Test mean (69)		8019
					LSD(0.05)		1211.0
Colorado[2] (Walsh)	1993	A807*R3224	62 42		. 53.0		1607
		A807*R8503	57	40		53.0	1154
		Martin B Line	62	36	.	51.0	1198
		RS626	57 40		. 52.0		851
					Test mean (13)		1269
					LSD(0.05)		.
	1994	A807*88BE2668	83 47		. 57.0		3948
		A807*R3224	84 41		. 59.0		3528
		A807*R8503	76 38		. 59.0		1988
		Martin B Line	84	42	.	58.0	4805
		RS626	70 41		. 55.0		3382
					Test mean (14)		3715
					LSD(0.05)		.
Indiana[2] (W. Lafayette)	1993 A	807*R3224	87	54	.	.	6585
		A807*R8503	87	53	.	.	7268
		Martin B Line	76	52	.	.	5213
		RS626	75	52	.	.	6683
					Test mean (46)		6977
					LSD(0.05)		1102.0
1994		A807*88BE2668	79	56	.	.	10119
		A807*R3224	79	56	.	.	9582
		A807*R8503	77	54	.	.	10511
		ATx399*RTx430	74	56	.	.	9173
		ATx378*RTx430	77	69	.	.	11843
		RS610	74	60	.	.	7990
					Test mean (48)		9343
					LSD(0.05)		1037.0
Kansas[2] (Hays)	1993	A807*88BE2668	70 50		. 61.0		8222
		A807*R3224	71 51		. 59.2		8182
		A807*R8503	68 48		. 60.1		7935
		ATx399*RTx430	72 49		. 59.6		8922
		ATx378*RTx430	74 56		. 59.9		9181
		RS626	67 46		. 58.3		6412
					Test mean (40)		7923
					LSD(0.05)		900.0

Table 13.con'd.

Kansas[2]	1994	A807*88BE2668	69	45		59.7	6811
		A807*R3224	71	44		59.5	6878
		A807*R8503	67	42		59.3	6274
		ATx399*RTx430	67	41		55.3	5711
		ATx378*RTx430	71	47		56.6	5576
		RS626	64	37		57.8	5035
						Test mean (48)	5998
						LSD(0.05)	.
Nebraska[2] (Mead)	1993 A	807*R3224	82	50	.	.	7039
		A807*R8503	83	50	.	.	6954
		ATx399*RTx430	83	51	.	.	7293
		ATx378*RTx430	84	60	.	.	5616
		RS626	81	48	.	.	3159
						Test mean (49)	5111.4
						LSD(0.05)	.
1994		A807*88BE2668	71	50	.	.	7831
		A807*R3224	74	51	.	.	6826
		A807*R8503	71	47	.	.	7405
		ATx399*RTx430	71	49	.	.	7019
		ATx378*RTx430	71	57	.	.	8851
		RS626	69	47	.	.	6293
						Test mean (47)	6918
						LSD(0.05)	.
Oklahoma[2] (Perkins)	1994	A807*88BE2668	62	45		54.0	2102
		A807*R3224	61	45		55.0	3715
		A807*R8503	61	43		54.0	2096
		ATx399*RTx430	58	41		52.0	2489
		ATx378*RTx430	61	46	.	56	1576
		RS626	58	37		50.0	2311
						Test mean (33)	2585
						LSD(0.05)	1102.0

[1]Data compiled from "Grain Sorghum Performance Tests in Texas" from 1993-2000.
[2]Data compiled from "Regional Sorghum Yield Trials" from 1993-1994.

From: Bill Rooney
To: "Ramasamy Perumal"
Subject: RE: Reco. letter requested
Date: Thursday, November 05, 2009 4:58:00 PM
Attachments: 11.05.09 Ramasamy Reference WVSU.pdf

Here's the letter. No need to come and get another copy. It'll be just like this one.

Regards,
Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

-----Original Message-----
From: Ramasamy Perumal [mailto:RPERUMAL@ag.tamu.edu]
Sent: Thursday, November 05, 2009 10:34 AM
To: wlr@tamu.edu
Subject: Reco. letter requested

Dear Sir
I will come and collect the hard copy of your reco. letter as soon as it is ready. Sorry for the inconvenience.
Thanks for all your timely help.
Sincerely
Ram

AgriLIFE RESEARCH & EXTENSION
Texas A&M System

TEXAS A&M UNIVERSITY

COLLEGE OF AGRICULTURE
AND L FE SCIENCES

Department of Soil and Crop Sciences

November 5, 2009

West Virginia State University
Research and Development Corporation
Human Resource Specialist
200 East Hall
PO Box 1000
Institute, WV 25112-1000

RE: Application of Ramasamy Perumal for Associate Director of Research

Dr. Ramasamy Perumal informed me that he is applying for the position Associate Director of Research at West Virginia State University; he has asked me to write a letter of reference for him. I am pleased to do so.

I have interacted with Dr. Perumal since 1998 when he arrived from India as a Rockefeller Foundation Post-Doctoral Fellow. He came to Texas A&M University to work with Dr. Clint Magill in the areas of molecular mapping of disease resistance in important agronomic crops. Dr. Perumal chose to conduct research in sorghum, probably because of its importance in both Texas and India. During his time as a Post-Doctoral Fellow at TAMU, Ramasamy demonstrated his strong work ethic and ability to conduct competent and diligent research.

After completing the fellowship, Dr. Perumal returned to India, but he eventually returned to North America and eventually to College Station in 2003 to work with Drs. Magill and Prom as an Associate Research Scientist in the Department of Plant Pathology. I do not know the details of these transitions, but I do know that we were happy to have him back on College Station to continue his research.

During his time in College Station, Dr. Perumal's research area focused on the molecular mapping of disease resistance genes in sorghum. While there are likely other research topics, I have interacted with Dr. Perumal on genetic resistance to head smut, downy mildew and anthracnose. This research can be difficult due to the variability caused by environment and the pathogen but due to Dr. Perumal's capabilities he has identified molecular markers that are linked to specific disease resistance genes. He has published this and numerous in which I have played a small part.

Based on my interactions with Dr. Perumal, allow me to assess his relative merits. In my opinion, his strongest characteristic is his work ethic. I have not seen many individuals who will work as long and as hard as Dr. Perumal to conduct and complete a research task or assignment. Academically, Dr. Perumal has proven competency and is clearly knowledgeable and capable of extending this information with students and other scientists. As this is an administrative position, his background in science should help him in assessing opportunities for science faculty at WVSU.

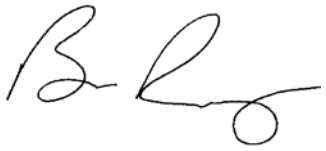
His personality allows him to work well as a mentor. He has mentored several of my students as they started their lab experiments and they have given me favorable reports on his ability to teach on a "one to one" basis. I cannot, however, assess his teaching ability or his administrative ability, but it is my understanding that he did do this in India prior to coming to the U.S.

Sorghum Breeding and Genetics
Department of Soil & Crop Sciences
2474 TAMU
Texas A&M University
College Station, TX 77843-2474

Tel. 979.845.2151
Fax. 979.862.1931
wlr@tamu.edu

Thus, I recommend that Dr. Perumal be considered for this position. Should you have additional questions of me regarding Dr. Perumal, please don't hesitate to contact me.

Regards,



William L. Rooney
Professor
Sorghum Breeding and Genetics
E-mail: wlr@tamu.edu

From: Bill Rooney
To: "Nina Estrada"
Subject: RE: Research Material Disclosure Form
Date: Monday, November 02, 2009 8:55:00 AM
Attachments: 11.02.09 OTC Rooney.pdf

Nina:

Attached is a digitally signed version of the Material Distribution.

If you need an original please let me know.

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151
-----Original Message-----
From: Nina Estrada [mailto:NAEstrada@ag.tamu.edu]
Sent: Wednesday, October 28, 2009 10:44 AM
To: Bill L Rooney
Cc: Susan Wilganowski
Subject: Research Material Disclosure Form

Dr. Rooney,

Attached you will find the above mentioned document. Please return this document to me fully-executed.

Kindest regards,

Nina Estrada
Contracts and Grants
Texas AgriLife Research

TEXAS A&M SYSTEM Office of TECHNOLOGY COMMERCIALIZATION

RESEARCH MATERIAL DISCLOSURE FORM

Please use the form fields to answer the questions regarding your research material. Complete only one form for each material, or set of materials, that you may want to distribute to others for research purposes.

(attach additional pages as necessary)

1. Research Material Designation (name or label for material):

Source:

Pedigree:

Description: This is a segregating F2 population of a grain type seed parent (med to low sugar concentration) and a traditional sweet sorghum cultivar.

2. Research Material Description:

This is an F2 population segregating for various traits, but specifically sugar concentration, biomass yield, plant height and maturity.

3. Please describe typical and expected uses for this Research Material:

The cooperator will use the population to develop an RIL population in order to map QTL for biomass yield and composition.

4. Principal Investigator(s):

William Rooney

5. List all Texas A&M System creators of the Research Material:

Name	Department	Center System Member
William Rooney	Soil & Crop Science	

6. List all other creators of the Research Material

Institution / Company / Organization Name

TEXAS A&M SYSTEM Office of TECHNOLOGY COMMERCIALIZATION

RESEARCH MATERIAL DISCLOSURE FORM

(attach additional pages as necessary)

7. Identify the grants, contracts, or other sources of funding contributing to the development of the Material. Please provide the grant number, granting entity, as well as the name of the Office and contact person that manages each grant.

none

8. Were these materials originally created using A&M facilities and resources?
☒Yes ☐No **If No, please explain below.**

9. Does this material relate, in whole or in part, to any disclosure previously submitted or anticipated for submission in the future, to the Office of Technology Commercialization?
☐Yes ☒No **If Yes, please provide details below.**

10. Does the Research Material incorporate materials that have been provided by a third party?
☐Yes ☒No **If Yes, please identify the providers of the other materials.**

11. Do you anticipate any commercial entities having interest in this material?
☐Yes ☒No
If yes, please identify any that have expressed interest and check if this disclosure is being submitted specifically in response to that entities' interest.

☐
☐
☐

12. Supporting Documents:
Please attach any documents relevant to this material and that may be important for our consideration, e.g., publications, Material Transfer Agreements, etc.

By typing my name below and emailing this completed form to mta@tamu.edu using my tamu.edu email account, I certify that the above information is complete and accurate.

Digitally signed by William L. Rooney
DN: cn=William L. Rooney, o=Texas A&M University, ou=Soil & Crop Science, email=wlr@tamu.edu, c=US
Date: 2009.11.02 08:42:38 -06'00'

Principal Investigator **Date**

Answer all questions on this form and email to the Office of Technology Commercialization at mta@tamu.edu

From: Bill Rooney
To: [redacted]
Subject: RE: research proposal
Date: Tuesday, November 10, 2009 8:32:00 AM
Attachments: Dissertation_proposal_wlr_comments.docx

Dan:

Very well done. Maybe a little light on methodology, but I think acceptable for submission for distribution to the committee.

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151
-----Original Message-----
From: Daniel Packer [redacted]
Sent: Monday, November 09, 2009 1:52 PM
To: Bill Rooney
Subject: research proposal

Dr. Rooney, I've attached a copy of my research proposal for your evaluation. Once you have suggested changes and I have made them, I'll then send the proposal to the rest of my committee.

Thanks,

Dan

From: Bill Rooney
To: "Pam Wilhelm"
Cc: "James L Heilman"
Subject: RE: South Dakota State U account
Date: Wednesday, November 11, 2009 10:21:00 AM
Attachments: 09-60471.pdf

Pam:

I'm attaching the proposal for the funding that should have come for the fiscal year that runs from 4/01/09 through 03/31/09. The funding should be subdivided between Heilman and me per the budgets that are provided.

Maybe you can reconcile what we have versus what we don't have in what arrived this year.

Sorry this is such a pain.

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

-----Original Message-----
From: Pam Wilhelm [mailto:PWilhelm@ag.tamu.edu]
Sent: Monday, November 09, 2009 8:07 AM
To: Bill Rooney
Subject: RE: South Dakota State U account

According to FAMIS the total award is $223,000.00. Short Title is Feedstock Partnership Award # 3TA153/Prine: DE-FC36-05G085041
It only has accounts for you and Heilman
Here's the printout of the Summary Budget Pool since the account started:

,SOUTH DAKOTA STATE UNIVERSITY , ,FY 2010 CC,06
Screen:,___,,Account:, ,,Fiscal Year:,2010,
,Thru Month:,11,,November ,,FY/PY/IN to Date:,IN,,Calc CM IDC:,N
sp Person:,BALTENSPERGER, DAVID, Bottom Line Exclusion:, 0.00
epartment:,SCSC ,Flags: D F B C Z G ABR,, Net Dir BBA:, 129718.24
,Map Code:,50000, ,N N Y R N N 009,,Unprotected Available:, 129718.24

bj	Description,	,Budget	Actual	Encumbrances,,Available
001	Revenue Pool ,,	223000-	32304-,	, 190696-
***	Total Revenue ,,	223000-	32304-,	, 190696-
	,, ,	,	,	
101	Salaries & Wages Poo,,	79898	13176 ,	7272 59450
000	Travel Pool ,,	12500	2110 ,	, 10390
000	Supplies Pool ,,	27734	3392 ,	, 24342
000	Other Expense Pool ,,	20700	2588 ,	, 18112
000	Capital Outlay Pool ,,	19705	2280	, 17425
**	Total Direct Expense,,	160537	23547 ,	7272 129718
600	Indirect Cost Pool ,,	62463	8837 ,	, 53626
***	Total Expenses ,,	223000	32384 ,	7272 183345

,* Account Total 0 80 7272 7352-

This print out might be easier to see but it's by # not name on the categories

,SOUTH DAKOTA STATE UNIVERSITY , ,FY 2010 CC,06
Screen:,___,,Account:, ,,Fiscal Year:,2010,
,Thru Month:,11,,November ,,FY/PY/IN to Date:,IN,,Calc CM IDC:,N
esp Person:,BALTENSPERGER, DAVID, Bottom Line Exclusion:, 0.00
Department:,SCSC ,Flags: D F B C Z G ABR,, Net Dir BBA:, 129718.24
,Map Code:,50000, ,N,N,Y,R,N,N,009,,Unprotected Available:, 129718.24

Obj ,C P	Budget	CM Actual	Actual	Encumbrances	,Available
0001,	223000.00-		32303.67-		190696.33-
****,	223000.00-		32303.67-		190696.33-
, , ,	,				
1101,	79898.00		13176.39	7271.76	59449.85
3000,	12500.00		2110.41		10389.59
4000,	27734.00		3391.75		24342.25
5000,	20700.00	80.00	2588.40		18111.60
8000,	19705.00		2280.05		17424.95
*** ,	160537.00	80.00	23547.00	7271.76	129718.24
9600,	62463.00		8836.67		53626.33
****,	223000.00	80.00	32383.67	7271.76	183344.57
* Total,,	.00	80.00	80.00	7271.76	7351.76-

Let me know if you need anything else or I can help.

>>> "Bill Rooney" <wlr@tamu.edu> 11/5/2009 5:52 PM >>>
Pam:

I've been looking at the SDSU proposal we submitted; the numbers don't match with what you've got listed below. According to the attached, we were due 80K and 83K for me and Heilman respectively. The outlay below is a little over 100K, so it doesn't match.

As far as I know this is the only funds that I have coming from SDSU. Can you reconcile this or give me a title or copy of the budgeting instructions?

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

-----Original Message-----
From: Pam Wilhelm [mailto:PWilhelm@ag.tamu.edu]
Sent: Thursday, September 10, 2009 9:52 AM
To: Bill L Rooney
Subject: South Dakota State U account

Dr. Rooney, this account has received new funding. I noticed you had set up a support account for Heilman that says Interim funding. Just wanted to check with you as to where the new funds should go.

salary $55036
travel $6500
supplies $10159
other $18516
capital outlay $11040

Proposal Type **Year**
UNS ☐ SUP ☐ CON ☐ MTA ☐
RES ☐ TRN ☐ REN ☐
SOL ☐ RFP ☐ No. _____
Contract/Grant No. _____

Project Function
Research ✗
Instruction ___
Public Service/Extension ___
Scholarship/Fellowship ___
Other: _____

DOCUMENT REVIEW/APPROVAL SHEET
(Internal Document Only)
TAMUS-THE AG PROGRAM
TAES ✗ TCE ☐

Mult. Submission? Yes ☐ No ☐
CFDA No.: _____
Sponsor ID: _____
Federal Flow Thru Yes ☐ No ☐ If Yes, see below
Prime Sponsor: _____

Prop. # 09-60471
Other # _____
Mail by _____

1. Title Biomass Feedstock Partnership - Herbaceous Crop Field Trails: Sorghum
2. Sponsor DOE Regional Feedstock Partnership/ South Dakota State University
2a. Sponsor Address SDSU/ Brooking, SD
Phone _____ Fax _____ E-mail _____

Special Instructions

3. Investigator(s) Information

Name	e-mail	College	Department / Unit	System	Phone
W. L. Rooney	wilr@tamu.edu	TAMU	Soil & Crop Sciences/ 056	06	845-3041
Jim Hielman	jheilman@ag.tamu.edu	TAMU	Soil & Crop Sciences/056	06	845-3041

COMPLETE AS APPROPRIATE
4. Human Subjects: ☐ YES ☑ NO
5. Lab Animals: ☐ YES ☑ NO
Species _____
6. Recombinant DNA: ☐ YES ☑ NO
7. Conflict of Interest: ☐ YES ☑ NO
8. Infectious Biohazards: ☐ YES ☑ NO
9. Classified or Proprietary: ☐ YES ☑ NO
10. Commercial Potential: ☐ YES ☑ NO
11. International Effort: ☐ YES ☑ NO
Involved Nations: _____
12. Scientific Diving: ☐ YES ☑ NO
13. Radioactive Material: ☐ YES ☑ NO
14. Involves University Faculty: ☑ YES ☐ NO
15. Use of University Facilities: ☑ YES ☐ NO
16. Renovations Required: ☐ YES ☑ NO

BUDGET INFORMATION
24. Current Period 4-1-09 to 3-31-10
25. Duration 1 Yr(s)
26. Total Sponsor Support: $ 163,000.00
27. Total Indirect: $ 43,419.00
27a. Indirect Rate: 46.5 %
28. Total Indirect Cost Base: $ 119581.00
28a. IDC Amount Waived: $ _____
29. F&A Level
30. F&A Justification
31. Tuition Status
32. Tuition Justification

COST SHARING INFORMATION
(Please attach cost sharing documentation)
31. Institutional Services

Acct.#	$ Amount
	21,422.00
	13,291.00
Indrect Charges matching	16,141.00

MAR 09 2009
Acct. #

Subtotal Inst. Services: $ 50,854.00
32. External Sources:
(Name): none $ 213,854.00
33. Total Project Cost (= #26 + #31 + #32) $ _____

Official Use Only
ANNUAL REPORT CODES
17. Activity
18. Field of Science
19. Area of Special Interest
20. Character of work: a. Basic b. Applied
21. Selection
22. Sponsor
23. LBB Requirement

34. PLANNED DISTRIBUTION OF SPONSOR FUNDS:

	INDIRECT COST			DIRECT COST (Expenditure Plan)		
System Part	$		%	System Part	$	%
06	$ 43419.00	100	%	06	$ 119581.00	100 %
	$		%		$	%
	$		%		$	%

APPROVALS: There must be approvals from all department heads, deans, and/or directors whose personnel or facilities are involved in conducting the proposed work.
ATTN. INVESTIGATORS: Your signature below certifies, to the best of your knowledge and belief, that...

a.) You are not delinquent on an Federal debt, such as student loans, etc. (this does not include income taxes); (applies to fellowships, scholarships, IPAs, etc. where the implied recipient of funds is an individual vs. an organization; per A-110.22 and A-129.)
b.) You are not currently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from current transactions by a Federal department or agency; (per Executive Order 12549).
c.) You agree to accept responsibility for the scientific conduct of the project and to provide the required progress reports if an award is made as a result of this application:
d.) You agree to comply with the TAMUS Conflict of Interest Rule (per NSF 60 F 35820, 7/11/95: NIH 60 FR 35810, 7/11/95).
e.) You agree to comply with the TAMUS Policy on Ethics in Research and Scholarship, TAMUS #15.99.03.
f.) You agree to comply with the TAMUS Policy on Management of Intellectual Property TAMUS #17.02.01

ATTN. DEPT. HEADS, DISTRICT EXT. DIRECTORS, UNIT LEADERS, DEANS, DIRECTORS: By your signature below you certify that you have reviewed this proposal and all accompanying forms; you are aware of all requirements of this project are committed to providing them, except as noted.

	INVESTIGATORS	DEPT HEAD / DED / UNIT LEADER	ASSOCIATE DIRECTORS / DEAN	ASSOCIATE DIRECTOR ADMINISTRATION	DIRECTOR/ V.P. RESEARCH
1. Signature					
Name/Title	W. L. Rooney/Professor	David Baltensperger/ SCSC			William Dugas
Date:	3/4/09	3/4/09			3.5.09
2. Signature					
Name/Title	James Heilman/Professor				
Date:	3/5/09				
3. Signature					
Name/Title					
Date:					
4. Signature					
Name/Title					
Date:					
5. Signature					
Name/Title					
Date:					

** When routing is completed, please forward to the Contracts and Grants Office, M.S. 2147 /Physical Address: Wells Fargo Bank Building, 3000 Briarcrest,Suite 101, Bryan, Texas

AgriLIFE RESEARCH
& EXTENSION
Texas A&M System

TEXAS A&M UNIVERSITY

COLLEGE OF AGRICULTURE
AND LIFE SCIENCES

Department of Soil and Crop Sciences

March 4, 2009

MEMORANDUM

TO: Jim Doolittle
Project Coordinator

FROM: David D. Baltensperger
Professor and Head

SUBJECT: Cost Sharing Obligation

On behalf of Texas A&M University, I am happy to endorse the Regional Biomass Feedstock Partnership - Herbaceous Bioenergy Crop Field Trials project. It is understood that the funding of this project by DOE requires matching funds of $50,854.00 for Bill Rooney and Jim Heilman's portion of this project. This match will be made by commitment of an appropriate percent of Drs. James Heilman, Frank Hons, Bill Ronney and George Hodnett's salary required to fulfill this dollar amount including fringe and IDC.

Thank you for your consideration.

cc: Bill Rooney
James Heilman
Carol J. Rhodes

Heep Center, 370 Olsen Boulevard
2474 TAMU
College Station, Texas 77843-2474

Tel. 979.845.3041
Fax. 979.845.0456
http://soilcrop.tamu.edu

Applicant Name: _____ Award Number: _____

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. DOE Feedstock				$163,000	$50,854	$213,854
2.						$0
3.						$0
4.						$0
5. Totals		$0	$0	$163,000	$50,854	$213,854

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity				Total (5)
	(1) Request	(2) Match	(3)	(4)	
a. Personnel	$50,568	$27,821			$78,389
b. Fringe Benefits	$12,906	$6,892			$19,798
c. Travel	$6,500	$0			$6,500
d. Equipment	$17,205	$0			$17,205
e. Supplies	$11,703	$0			$11,703
f. Contractual	$0	$0			$0
g. Construction	$0	$0			$0
h. Other	$20,699	$0			$20,699
i. Total Direct Charges (sum of 6a-6h)	$119,581	$34,713	$0	$0	$154,294
j. Indirect Charges	$43,419	$16,141			$59,560
k. **Totals** (sum of 6i-6j)	$163,000	$50,854	$0	$0	$213,854
7. Program Income	$0	$0			$0

Section C - Non-Federal Resources

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) **Totals**
8.	$50,854			$50,854
9.				$0
10.				$0
11.				$0
12. **Total** (sum of lines 8 - 11)	$50,854	$0	$0	$50,854

Section D - Forecasted Cash Needs

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th quarter
13. Federal	$163,000	$40,750	$40,750	$40,750	$40,750
14. Non-Federal	$50,854	$12,713.50	$12,713.50	$12,713.50	$12,713.50
15. **Total** (sum of lines 13 and 14)	$213,854	$53,464	$53,464	$53,464	$53,464

Section E - Budget Estimates of Federal Funds Needed for Balance of the Project

	Future Funding Periods (Years)			
(a) Grant Program	(b) First	(c) Second	(d) Third	(e) Fourth
16.				
17.				
18.				
19.				
20. **Total** (sum of lines 16-19)	$0	$0	$0	$0

Section F - Other Budget Information

21. Direct Charges

Requested Funds - $119,581; Match - $34,712

22. Indirect Charges

Requested Fund - $43,419; Match - $16,141

23. Remarks

DHHS negotiated rate agreement dated January 4, 2008 establishes the institutional indirect cost rate at 46.5% of modified total direct costs.

Instructions for the SF-424A

Public Reporting Burden for this collection of information is estimated to average 3.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Please do not return your completed form to the Office of Management and Budget; send it to the address provided by the sponsoring agency.

General Instructions
This form is designed so that application can be made for funds from one or more grant programs. In preparing the budget, adhere to any existing Federal grantor agency guidelines which prescribe how and whether budgeted amounts should be separately shown for different functions or activities within the program. For some programs, grantor agencies may require budgets to be separately shown by function or activity. For other programs, grantor agencies may require a breakdown by function or activity. Sections A, B, C, and D should include budget estimates for the whole project except when applying for assistance which requires Federal authorization in annual or other funding period increments. In the later case, Sections A, B, C, and D should provide the budget for the first budget period (usually a year) and Section E should present the need for Federal assistance in the subsequent budget periods. All applications should contain a breakdown by the object class categories shown in Lines a-k of Section B.

Section A. Budget Summary Lines 1-4 Columns (a) and (b)
For applications pertaining to a **single** Federal grant program (Federal Domestic Assistance Catalog number) and **not requiring** a functional or activity breakdown, enter on Line 1 under Column (a) the catalog program title and the catalog number in Column (b).

For applications pertaining to a **single** program **requiring** budget amounts by multiple functions or activities, enter the name of each activity or function on each line in Column (a), and enter the catalog number in Column (b). For applications pertaining to multiple programs where none of the programs require a breakdown by function or activity, enter the catalog program title on each line in **Column** (a) and the respective catalog number on each line in Column (b).
For applications pertaining to **multiple** programs where one or more programs **require** a breakdown by function or activity, prepare a separate sheet for each program requiring the breakdown. Additional sheets should be used when one form does not provide adequate space for all breakdown of data required. However, when more than one sheet is used, the first page should provide the summary totals by programs.

Lines 1-4, Columns (c) through (g)

For new applications, leave Columns (c) and (d) blank. For each line entry in Columns (a) and (b), enter in Columns (e), (f), and (g) the appropriate amounts of funds needed to support the project for the first funding period (usually a year).

For continuing grant program applications, submit these forms before the end of each funding period as required by the grantor agency. Enter in Columns (c) and (d) the estimated amounts of funds which will remain unobligated at the end of the grant funding period only if the Federal grantor agency instructions provide for this. Otherwise, leave these columns blank. Enter in columns (e) and (f) the amounts of funds needed for the upcoming period. The amount(s) in Column (g) should be the sum of amounts in Columns (e) and (f).

For supplemental grants and changes to existing grants, do not use Columns (c) and (d). Enter in Column (e) the amount of the increase or decrease of Federal funds and enter in Column (f) the amount of the increase or decrease of non-Federal funds. In Column (g) enter the new total budgeted amount (Federal and non-Federal) which includes the total previous authorized budgeted amounts plus or minus, as appropriate, the amounts shown in Columns (e) and (f). The amount(s) in Column (g) should not equal the sum of amounts in Columns (e) and (f).

Line 5—Show the totals for all columns used.

Section B. Budget Categories
In the column headings (a) through (4), enter the titles of the same programs, functions, and activities shown on Lines 1-4, Column (a), Section A. When additional sheets are prepared for Section A, provide similar column headings on each sheet. For each program, function or activity, fill in the total requirements for funds (both Federal and non-Federal) by object class categories.

Lines 6a-i—Show the totals of Lines 6a to 6h in each column.

Line 6j—Show the amount of indirect cost.

Line 6k—Enter the total of amounts on Lines 6i and 6j. For all applications for new grants and continuation grants the total amount in column (5), Line 6k, should be the same as the total amount shown in Section A, Column (g), Line 5. For supplemental grants and changes to grants, the total amount of the increase or decrease as shown in Columns (1)-(4), Line 6k should be the same as the sum of the amounts in Section A, Columns (e) and (f) on Line 5.
Line 7—Enter the estimated amount of income, if any, expected to be generated from this project. Do not add or subtract this amount from the total project amount. Show under the program narrative statement the nature and source of income. The estimated amount of program income may be considered by the federal grantor agency in determining the total amount of the grant.

Section C. Non-Federal Resources

Lines 8-11—Enter amounts of non-Federal resources that will be used on the grant. If in-kind contributions are included, provide a brief explanation on a separate sheet.

Column (a)—Enter the program titles identical to Column (a), Section A. A breakdown by function or activity is not necessary.

Column (b)—Enter the contribution to be made by the applicant.

Column (c)—Enter the amount of the State's cash and in-kind contribution if the applicant is not a State or State agency. Applicants which are a State or State agencies should leave this column blank.

Column (d)—Enter the amount of cash and in-kind contributions to be made from all other sources.

Column (e)—Enter totals of Columns (b), (c), and (d).

Line 12—Enter the total for each of Columns (b)-(e). The amount in Column (e) should be equal to the amount on Line 5, Column (f) Section A.

Section D. Forecasted Cash Needs

Line 13—Enter the amount of cash needed by quarter from the grantor agency during the first year.

Line 14—Enter the amount of cash from all other sources needed by quarter during the first year.

Line 15—Enter the totals of amounts on Lines 13 and 14.

Section E. Budget Estimates of Federal Funds Needed for Balance of the Project

Lines 16-19—Enter in Column (a) the same grant program titles shown in Column
(a), Section A. A breakdown by function or activity is not necessary. For new applications and continuation grant applications, enter in the proper columns amounts of Federal funds which will be needed to complete the program or project over the succeeding funding periods (usually in years). This section need not be completed for revisions (amendments, changes, or supplements) to funds for the current year of existing grants.
If more than four lines are needed to list the program titles, submit additional schedules as necessary.

Line 20—Enter the total for each of the Columns (b)-(e). When additional schedules are prepared for this Section, annotate accordingly and show the overall totals on this line.

Section F. Other Budget Information

Line 21—Use this space to explain amounts for individual direct object-class cost categories that may appear to be out of the ordinary or to explain the details as required by the Federal grantor agency.

Line 22—Enter the type of indirect rate (provisional, predetermined, final or fixed) that will be in effect during the funding period, the estimated amount of the base to which the rate is applied, and the total indirect expense.

Line 23—Provide any other explanations or comments deemed necessary.

Instructions and Summary

Award Number: _____ Date of Submission: _____

Award Recipient: _____ Form submitted by: _____

(May be award recipient or sub-recipient)

Please read the instructions on each page before starting.
If you have any questions, please ask your DOE contact. It will save you time!

On this form, provide detailed support for the estimated project costs identified on the SF-424A form (Budget).

- The dollar amounts on this page must match the amounts on the associated SF-424A.
- The award recipient and each sub-recipient with estimated costs of $100,000 or more must complete this form and a SF-424A form.
- The total budget presented on this form and on the SF424A must include both Federal (DOE), and Non-Federal (cost share) portions, thereby reflecting TOTAL PROJECT COSTS proposed.
- For costs in each Object Class Category on the SF-424A, complete the corresponding worksheet on this form (tab at the bottom of the page).
- All costs incurred by the preparer's sub-recipients, vendors, contractors, consultants and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

(Note: The values in this summary table are from entries made in each budget category sheet.)

CATEGORY	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Total Costs	Project Costs %	Comments (Add comments as needed)
a. Personnel	$78,389	$0	$0	**$78,389**	**36.7%**	
b. Fringe Benefits	$19,797	$0	$0	**$19,797**	**9.3%**	
c. Travel	$6,500	$0	$0	**$6,500**	**3.0%**	
d. Equipment	$17,205	$0	$0	**$17,205**	**8.0%**	
e. Supplies	$11,703	$0	$0	**$11,703**	**5.5%**	
f. Contractual						
Sub-recipient	*$0*	*$0*	*$0*	*$0*	*0.0%*	
FFRDC	*$0*	*$0*	*$0*	*$0*	*0.0%*	
Vendor	*$0*	*$0*	*$0*	*$0*	*0.0%*	
Total Contractual	$0	$0	$0	**$0**	**0.0%**	
g. Construction	$0	$0	$0	**$0**	**0.0%**	
h. Other Direct Costs	$20,699	$0	$0	**$20,699**	**9.7%**	
i. Indirect Charges	$59,560	$0	$0	**$59,560**	**27.9%**	
Total Project Costs	**$213,853**	**$0**	**$0**	**$213,853**	**100.0%**	

Additional Explanations/Comments (as necessary)

Costs include requested funds and matching funds commitment.

a. Personnel

PLEASE READ!!!

List costs solely for employees of the entity completing this form (award recipient or sub-recipient). All other personnel costs (of subrecipients or other contractual efforts of the entity preparing this) must be included under f., Contractual. This includes all consultants and FFRDCs.

Identify positions to be supported. Key personnel should be identified by title. All other personnel should be identified either by title or a group category. State the amounts of time (e.g., hours or % of time) to be expended, the composite base pay rate, total direct personnel compensation and identify the rate basis (e.g., actual salary, labor distribution report, technical estimate, state civil service rates, etc.).

Add rows as needed. Formulas/calculations will need to be entered by the preparer of this form. Please enter formulas as shown in the example.

Task # and Title	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 3			
1. Generation 2A Receiver Design		**10000**		**$423,000**	**600**		**$24,000**	**800**		**$31,000**	**11400**	**$478,000**	**Actual Salary**
EXAMPLE	Sr. Engineer	2000	$85.00	$170,000	200	$50.00	$10,000	200	$50.00	$10,000	**2400**	**$190,000**	Actual Salary
ONLY!!!	Electrical engineers	6200	$35.00	$217,000	400	$35.00	$14,000	600	$35.00	$21,000	**7200**	**$252,000**	Actual Salary
	Technician	1800	$20.00	$36,000	0	$0.00	$0	0	$0.00	$0	**1800**	**$36,000**	Actual Salary
	Postdoctoral Research Associate	1044	$19.83	$20,700	0	$0.00	$0						Actual Salary
	Student Worker	480	$11.00	$5,280									Actual Salary
	Graduate Research Assistants	1566	$15.70	$24,588									Actual Salary
	Cost Share												
	George L. Hodnett	457	$27.35	$12,500									
	William Rooney 5% time	73	$62.00	$4,500									
	Jim Heilman	104	$49.48	$5,146									
	Frank Hons	104	$54.57	$5,675									

Task # and Title	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 3			
	Total Personnel Costs	3828		$78,389	0		$0	0		$0	0	$78,389	

Additional Explanations/Comments (as necessary)

b. Fringe Benefits

	Budget Period 1	Budget Period 2	Budget Period 3	Total
Rate applied:	25.5%	0.0%	0.0%	
Total fringe requested:	$19,797	$0	$0	$19,797

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information, if it has not already been provided to the Contracting Officer, OR if it has changed since it was. Calculate the fringe rate and enter the total amount in Section B, line 6.b. ("Fringe Benefits") of form SF-424A.

X **A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the appliction of the approved rate, to arrive at the proposed fringes benefits dollars should also be provided.)

____ **There is not a current, federally approved rate agreement negotiated and available.**
(When this option is checked, the entity preparing this form shall submit a rate proposal in the format provided at the following website, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

Additional explanation/comments (as necessary)

c. Travel

PLEASE READ!!!

Provide travel detail as requested below, identifying total Foreign and Domestic Travel as separate items. Purpose of travel are items such as professional conference, DOE sponsored meeting, project management meeting, etc. The Basis for Estimating Costs are items such as past trips, current quotations, Federal Travel Regulations, etc.

All listed travel must be necessary for performance of the Statement of Projecct Objectives.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Budget Period 1							
Domestic Travel							
EXAMPLE ONLY!!! Visit to PV cell mfr. to set up vendor agreement	2			2	$650	$1,300	Internet prices
Travel to Each Location at Harvest	1			3	$1,500	$1,500	Historical Data
Travel to SunGrant Meeting	1			3	$2,000	$2,000	Historical Data
Travel to Planning Session	1			3	$2,000	$2,000	Historical Data
Travel to Other Meeting	1			2	$1,000	$1,000	Historical Data
						$0	
						$0	
						$0	
						$0	
Domestic Travel subtotal						$6,500	
International Travel							
						$0	
						$0	
						$0	
						$0	
International Travel subtotal						$0	
Budget Period 1 Total						**$6,500**	

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Budget Period 2							
Domestic Travel							
						$0	
						$0	
						$0	
Domestic Travel subtotal						$0	
International Travel							
						$0	
						$0	
						$0	
						$0	
International Travel subtotal						$0	
Budget Period 2 Total						**$0**	
Budget Period 3							
Domestic Travel							
						$0	
						$0	
						$0	
						$0	
						$0	
						$0	
Domestic Travel subtotal						$0	
International Travel							
						$0	
						$0	
						$0	
						$0	
International Travel subtotal						$0	
Budget Period 3 Total						**$0**	
PROJECT TOTAL						**$6,500**	

Additional Explanations/Comments (as necessary)

d. Equipment

PLEASE READ!!!

Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Further definitions can be found at 10 CFR 600 found on the PMC Recipient Resources Forms page at https://www.eere-pmc.energy.gov/Forms.aspx#regs .

List all proposed equipment below, providing a basis of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying its need as it applies to the Statement of Project Objectives. If it is existing equipment, and the value of its contribution to the project budget is being shown as cost share, provide logical support for the estimated value shown. If it is new equipment which will retain a useful life upon completion of the project, provide logical support for the estimated value shown.

For equipment over $50,000 in price, also include a copy of the associated vendor quote or catalog price list.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Thermal shock chamber	2	$20,000	$40,000	Vendor Quote	Reliability testing of PV modules- Task 4.3
Computer	1	$2,500	$2,500	Standard Estimate	
NIR Software	1	$7,500	$7,500	Vendor Quote	
TDR Soil Moisture System	1	$7,205	$7,205	Vendor Quote	
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 1 Total			$17,205		
Budget Period 2					
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 2 Total			$0		

Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 3					
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 3 Total			$0		
PROJECT TOTAL			**$17,205**		

Additional Explanations/Comments (as necessary)

e. Supplies

PLEASE READ!!!

Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Further definitions can be found at 10 CFR 600 found on the PMC Recipient Resources Forms page at https://www.eere-pmc.energy.gov/Forms.aspx#regs.

List all proposed supplies below, providing a bases of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Wireless DAS components	10	$360.00	$3,600	Catalog price	For Alpha prototype - Task 2.4
Field Costs, including fert., pest, etc	1	$2,548.00	$2,548		
Sample Preparation and Supplies	1	$1,600.00	$1,600		
Weather Station - small equipment	1	$2,400.00	$2,400		
Thermocouple and wire	1	$800.00	$800		
Batteries (12 V deep cycle, etc.)	1	$500.00	$500		
Mateirals for Constructing Static Chambers	1	$2,800.00	$2,800		
Irrigation supplies	1	$250.00	$250		
Expendables (calibration gases, dessicants, etc.	1	$805.00	$805		
			$0		
			$0		
Budget Period 1 Total			**$11,703**		
Budget Period 2					
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 2 Total			$0		

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 3					
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 3 Total			$0		
PROJECT TOTAL			$11,703		

Additional Explanations/Comments (as necessary)

f. Contractual

PLEASE READ!!!

The entity completing this form must provide all costs related to sub-recipients, vendors, contractors, consultants and FFRDC partners in the applicable boxes below.

Sub-recipients (partners, sub-awardees):
For each sub-recipient with total project costs of $100,000 or more, a separate SF-424A budget and PMC123.1 budget justification form must be submitted. These sub-recipient forms may be completed by either the sub-recipients themselves or by the preparer of this form. The budget totals on the sub-recipient's forms must match the sub-recipeint entries below.

The preparer of this form need only provide further support of the completed sub-recipient budget forms as they deem necessary. The support to justify the budgets of sub-recipients with estimated costs less than $100,000 may be in any format, and at a minimum should provide what Statement of Project Objectives task(s) are being performed, the purpose/need for the effort, and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Vendors (includes contractors and consultants):
List all vendors, contractors and consultants supplying commercial supplies or services used to support the project. The support to justify vendor costs (in any amount) should provide the purpose for the products or services and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Federal Research and Development Centers (FFRDCs):
For FFRDC partners, award recipient will provide a Field Work Proposal (if not already provided with the original application), along with the FFRDC labor mix and hours, by category and FFRDC major purchases greater than $25,000, including Quantity, Unit Cost, Basis of Cost, and Justification. The award recipient may allow the FFRDC to provide this information directly to DOE.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! XYZ Corp.	Partner to develop optimal fresnel lens for Gen 2 product - Task 2.4	$48,000	$32,000	$16,000	**$96,000**
					$0
					$0
					$0
					$0
					$0

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
					$0
					$0
					$0
	Sub-total	$0	$0	$0	$0

Vendor Name/Organization	Product or Service, Purpose/Need and Basis of Cost (Provide additional support at bottom of page as needed)	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! ABC Corp.	Vendor for developing custom robotics to perform lens inspection, alignment, and placement (Task 4). Required for expanding CPV module mfg. capacity. Cost is from competitive quotes.	$32,900	$86,500		**$119,400**
					$0
					$0
					$0
					$0
					$0
					$0
					$0
		$0	$0	$0	$0

FFRDC Name/Organization	Purpose	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
					$0
					$0
					$0
		$0	$0	$0	$0

Total Contractual		$0	$0	$0	$0

AdditionalExplanations/Comments (as necessary)

g. Construction

PLEASE READ!!!

Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient to the award recipient should be entered under f. Contractual.

List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Overall description of construction actiivities:

Example Only!!! - Build wind turbine platform

General Description	Cost	Basis of Cost	Justification of need
Budget Period 1			
Three days of excavation for platform site EXAMPLE ONLY!!!	$28,000	Engineering estimate	Site must be prepared for construction of platform.
Budget Period 1 Total	$0		
Budget Period 2			
Budget Period 2 Total	$0		

General Description	Cost	Basis of Cost	Justification of need
Budget Period 3			
Budget Period 3 Total	$0		
PROJECT TOTAL	**$0**		

Additional Explanations/Comments (as necessary)

h. Other Direct Costs

PLEASE READ!!!

Other direct costs are direct cost items required for the project which do not fit clearly into other categories, and are not included in the indirect pool for which the indirect rate is being applied to this project. Examples are meeting costs, postage, couriers or express mail, telephone/fax costs, printing costs, etc.

Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

General description	Cost	Basis of Cost	Justification of need
		Budget Period 1	
EXAMPLE ONLY!!! Grad student tuition	$16,000	Established UCD costs	Support of graduate students working on project
Field Equipment Maintance and Calibration	$6,199	historical data	
Tractor/Harvest Use/Rental	$3,500	historical data	
Land Rental and Preparation	$2,000	historical data	
Tuition - Graduate Students	$9,000	TAMU fees	
Budget Period 1 Total	$20,699		
		Budget Period 2	
Budget Period 2 Total	$0		
		Budget Period 3	
Budget Period 3 Total	$0		
PROJECT TOTAL	**$20,699**		

Additional Explanations/Comments (as necessary)

i. Indirect Costs

	Budget Period 1	Budget Period 2	Budget Period 3	Total
Rate applied:	46.5%	0.0%	0.0%	
Total indirect costs requested:	$59,560			$59,560

A federally approved indirect rate agreement, or rate proposed supported and agreed upon by DOE for estimating purposes is required if reimbursement of fringe benfits is requested. Please check (X) one of the options below and provide the requested information if it has not already been provided as requested, or has changed. Calculate the indirect rate dollars and enter the total in the Section B., line 6.j. (Indirect Charges) of form SF 424A.

X **There is a federally approved indirect rate agreement. A copy is provided with this application and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the application of the approved rate, to arrive at the proposed indirect charges proposed should also be provided.)

____ **There is no current, federally-approved indirect rate agreement.**
(When this option is checked, the entity preparing this form shall submit an indirect cost rate proposal in the format provided at the following website, or in a format that provides the same level of information and which supports the rate(s) being proposed for use in estimating the project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

Additional Explanations/Comments (as necessary)

DHHS Agreement dated January 4, 2008 establishes the indirect cost rate at 46.5% of modified total direct costs.

Cost Share

PLEASE READ!!!

A detailed presentation of the cash or cash value of all cost share proposed for the project must be provided in the table below. Identify the source & amount of each item of cost share proposed by the award recipient and each sub-recipient or vendor. Letters of committment must be submitted for all third party cost share (other than award recipient).

Note that "cost-share" is not limited to cash investment. Other items that may be assigned value in a budget as incurred as part of the project budget and necessary to performance of the project, may be considered as cost share, such as: contribution of services or property; donated, purchased or existing equipment; buildings or land; donated, purchased or existing supplies; and/or unrecovered personnel, fringe benefits and indirect costs, etc. For each cost share contribution identified as other than cash, identify the item and describe how the value of the cost share contribution was calculated.

Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include private, state or local Government, or any source not originally derived from Federal funds. Documentation of cost sharing commitments must be provided, if not already provided with the original application and they have not changed since its submission.

Fee or profit will not be paid to the award recipients or subrecipients of financial assistance awards. Additionally, foregone fee or profit by the applicant shall not be considered cost sharing under any resulting award. Reimbursement of actual costs will only include those costs that are allowable and allocable to the project as determined in accordance with the applicable cost principles prescribed in 10 CFR 600.127, 10 CFR 600.222 or 10 CFR 600.317. Also see 10 CFR 600.318 relative to profit or fee.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Organization/Source	Type (cash or other)	Cost Share Item	Budget Period 1 Cost Share	Budget Period 2 Cost Share	Budget Period 3 Cost Share	Total Project Cost Share
ABC Company **EXAMPLE ONLY!!!**	Cash	Project partner ABC Company will provide 40 PV modules for product development at 50% off the of the retail price of $680	$13,600			**$13,600**
	other	Salaries of George L. Hodnett, William L. Rooney Jim Heilman, and Frank Hons plus fringe benfits and indirect costs	$50,854			**$50,854**
						$0
						$0
						$0
						$0
						$0

Organization/Source	Type (cash or other)	Cost Share Item	Budget Period 1 Cost Share	Budget Period 2 Cost Share	Budget Period 3 Cost Share	Total Project Cost Share
						$0
						$0
						$0
						$0
		Totals	$50,854	$0	$0	$50,854

Total Project Cost: $197,712

Cost Share Percent of Award: 25.7%

Additional Explanations/Comments (as necessary)

SUMMARY BUDGET

	Requested	Match
Salaries and Wages	50,568	27,821
Fringe Benefits	12,906	6,892
Travel	6,500	0
Equipment	17,205	0
Supplies	11,703	0
Contractual	0	0
Construction	0	0
Other	20,699	0
Total Direct	119,581	34,712
Indirect Costs	43,419	16,141
Total Cost	163,000	50,854

From: Gary Odvody
To: Patt Junek
CC: Bill L Rooney
Date: 2/24/2009 2:58 PM
Subject: Cost share letter and budget spreadsheet for Odvody portion of Regional Biomass Feedstock Partnership
Attachments: SF-424AOdvody.xls; TEXAS AGRILIFE RESEARCH.tif

Patt,

I have attached the budget document (2 pages, summary and expanded budget, same Excel file) and a tif image of the cost-sharing letter for Gary Odvody, GO085041, as part of the Regional Biomass Feedstock Partnership. . . . .project. I am sending this from a site outside my office so thought it best to send it to you and if you could give it to the appropriate person in your office, Barry Good, I believe.

I'll be out of the office through Saturday morning but will be checking my emails daily.

Thanks,

Gary Odvody
Texas A&M Rsch & Extn Ctr
10345 Agnes St.
Corpus Christi, TX 78406-9704
361-265-9201 (Phone)
361-265-9434 (Fax)
g-odvody@tamu.edu (Email)

TEXAS AGRILIFE RESEARCH & EXTENSION
CENTER AT CORPUS CHRISTI

AgriLIFE RESEARCH
Texas A&M System

February 23, 2009

TO: Jim Doolittle
Project Coordinator

FROM: Juan Landivar
Resident Director

SUBJECT: Cost Sharing Obligation

An appropriate percentage of Dr. Gary Odvody's salary will be committed to meet the $10,000 cost-sharing requirement for participation of Gary Odvody, GO085041, in the Regional Biomass Feedstock Partnership- Herbaceous Bioenergy Crop Field Trials project. This represents 25% of the $40,000 budgeted amount for his portion of this project.

Thank you for the opportunity to participate in this project.

cc Gary Odvody
Kathy Jones
Stephanie Klock

10345 State Hwy 44
Corpus Christi, Tx 78406-1412

Tel. 361.265.9201
Fax. 361.265.9434

g-odvody@tamu.edu
http://ccag.tamu.edu

Applicant Name:Gary Odvody

Award Number: GO085041

Expanded Budget

Object Class Categories	(2) Budge amount	Budget Item Details
a. Personnel	$12,000	Wage employees (1 to 2 part time)
b. Fringe Benefits	$1,212	Fringe benefit costs on wage employees
c. Travel	$3,592	Travel by PI to other experiment sites to assess disease incidence
d. Equipment	$0	
e. Supplies	$9,000	Fertilizer, herbicide, fuel, and equipment maintenance & repair
f. Contractual	$1,500	Land lease costs at experiment site
g. Construction	$0	
h. Other	$0	
i. Total Direct Charges (sum of 6a-6h)	$27,304	
j. Indirect Charges	$12,696	46.5% indirect costs
k. **Totals** (sum of 6i-6j)	$40,000	

From: "Bill Rooney" <wlr@tamu.edu>
To: "'Patt Junek'" <p-junek@tamu.edu>
Date: 3/3/2009 7:09 AM
Subject: status of paperwork sent over last week.
Attachments: Sustainability SOW- Heilman.doc; SOW Sorghum - CS TX.doc; PMC123_1-Budget_Justification Rooney.xls; SF-424A Rooney.xls; EXcel Budget - Rooney and Heilman.xls; PMC123_1-Budget_Justification.xls; SF-424A.xls

Patt:

I wanted to find out if the budget had been developed for the DOE Regional Feedstock Partnership Funding that Jim Heilman and I have PROCURED (not proposal). The funds are currently at SDSU and I need to get them a Agency-approved budget and Cost-share letter.

We sent the information attached over early last week and I haven't heard anything. Carol is waiting for the approved budget before writing a cost share committement letter AND South Dakota State is waiting on me to get this to them.

I realize this probably got lost in all the other preproposal floating around, but if you can give this high priority, I would sure appreciate it. There's 160K ready to come to Texas, if we can get the paperwork done.

Once done, please to send to both Carol and I. I have to submit as part of a group (multiple institutions to SDSU). I need to submit to them:

1. Approved budget (completed SF424 and PMC 123 Justification). My feeble attempts are attached, but not complete - originals are attached to start over if needed.
2. Letter of Transmittal (confirming budget, overhead is correct).
3. Cost-share letter (Carol will write once budget is approved).

If you have questions, please call me 5-2151 or 220-1951.

Thanks - I really have to submit this by THURSDAY of this week.

regards,

bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

From:	Bill Rooney
To:	"Pam Wilhelm"
Subject:	RE: South Dakota State U account
Date:	Thursday, November 05, 2009 5:52:00 PM
Attachments:	SF-424A Texas CS - Rooney revised.xls

Pam:

I've been looking at the SDSU proposal we submitted; the numbers don't match with what you've got listed below. According to the attached, we were due 80K and 83K for me and Heilman respectively. The outlay below is a little over 100K, so it doesn't match.

As far as I know this is the only funds that I have coming from SDSU. Can you reconcile this or give me a title or copy of the budgeting instructions?

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

-----Original Message-----
From: Pam Wilhelm [mailto:PWilhelm@ag.tamu.edu]
Sent: Thursday, September 10, 2009 9:52 AM
To: Bill L Rooney
Subject: South Dakota State U account

Dr. Rooney, this account has received new funding. I noticed you had set up a support account for Heilman that says Interim funding. Just wanted to check with you as to where the new funds should go.

salary $55036
travel $6500
supplies $10159
other $18516
capital outlay $11040

Applicant Name: Texas AgriLife Research Award Number:

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Feedstock Trial and Management				$80,000	$31,383	$111,383
2. Sustainability				$83,000	$19,471	$102,471
3.						$0
4.						$0
5. Totals		$0	$0	$163,000	$50,854	$213,854

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity				Total (5)
	(1) Request	(2) Match	(3)	(4)	
a. Personnel	$50,568	$27,821			$78,389
b. Fringe Benefits	$12,906	$6,892			$19,798
c. Travel	$6,500	$0			$6,500
d. Equipment	$17,205	$0			$17,205
e. Supplies	$11,703	$0			$11,703
f. Contractual	$0	$0			$0
g. Construction	$0	$0			$0
h. Other	$20,699	$0			$20,699
i. Total Direct Charges (sum of 6a-6h)	$119,581	$34,713	$0	$0	$154,294
j. Indirect Charges	$43,419	$16,141			$59,560
k. Totals (sum of 6i-6j)	$163,000	$50,854	$0	$0	$213,854
7. Program Income	$0	$0			$0

Previous Edition Usable

SF-424A (Rev. 4-92)
Prescribed by OMB Circular A-102

Section C - Non-Federal Resources					
(a) Grant Program		(b) Applicant	(c) State	(d) Other Sources	(e) Totals
8.		$50,854			$50,854
9.					$0
10.					$0
11.					$0
12. Total (sum of lines 8 - 11)		$50,854	$0	$0	$50,854

Section D - Forecasted Cash Needs					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th quarter
13. Federal	$163,000	$40,750	$40,750	$40,750	$40,750
14. Non-Federal	$50,854	$12,713.50	$12,713.50	$12,713.50	$12,713.50
15. Total (sum of lines 13 and 14)	$213,854	$53,464	$53,464	$53,464	$53,464

Section E - Budget Estimates of Federal Funds Needed for Balance of the Project				
	Future Funding Periods (Years)			
(a) Grant Program	(b) First	(c) Second	(d) Third	(e) Fourth
16.				
17.				
18.				
19.				
20. Total (sum of lines 16-19)	$0	$0	$0	$0

Section F - Other Budget Information	
21. Direct Charges	22. Indirect Charges
Requested Funds - $119,581; Match - $34,712	Requested Fund - $43,419; Match - $16,141

23. Remarks

DHHS negotiated rate agreement dated January 4, 2008 establishes the institutional indirect cost rate at 46.5% of modified total direct costs.

Instructions for the SF-424A

General Instructions

This form is designed so that application can be made for funds from one or more grant programs. In preparing the budget, adhere to any existing Federal grantor agency guidelines which prescribe how and whether budgeted amounts should be separately shown for different functions or activities within the program. For some programs, grantor agencies may require budgets to be separately shown by function or activity. For other programs, grantor agencies may require a breakdown by function or activity. Sections A, B, C, and D should include budget estimates for the whole project except when applying for assistance which requires Federal authorization in annual or other funding period increments. In the later case, Sections A, B, C, and D should provide the budget for the first budget period (usually a year) and Section E should present the need for Federal assistance in the subsequent budget periods. All applications should contain a breakdown by the object class categories shown in Lines a-k of Section B.

Section A. Budget Summary Lines 1-4 Columns (a) and (b)

For applications pertaining to a **single** Federal grant program (Federal Domestic Assistance Catalog number) and **not requiring** a functional or activity breakdown, enter on Line 1 under Column (a) the catalog program title and the catalog number in Column (b).

For applications pertaining to a **single** program **requiring** budget amounts by multiple functions or activities, enter the name of each activity or function on each line in Column (a), and enter the catalog number in Column (b). For applications pertaining to multiple programs where none of the programs require a breakdown by function or activity, enter the catalog program title on each line in **Column** (a) and the respective catalog number on each line in Column (b).

For applications pertaining to **multiple** programs where one or more programs **require** a breakdown by function or activity, prepare a separate sheet for each program requiring the breakdown. Additional sheets should be used when one form does not provide adequate space for all breakdown of data required. However, when more than one sheet is used, the first page should provide the summary totals by programs.

Lines 1-4, Columns (c) through (g)

For new applications, leave Columns (c) and (d) blank. For each line entry in Columns (a) and (b), enter in Columns (e), (f), and (g) the appropriate amounts of funds needed to support the project for the first funding period (usually a year).

For continuing grant program applications, submit these forms before the end of each funding period as required by the grantor agency. Enter in Columns (c) and (d) the estimated amounts of funds which will remain unobligated at the end of the grant funding period only if the Federal grantor agency instructions provide for this. Otherwise, leave these columns blank. Enter in columns (e) and (f) the amounts of funds needed for the upcoming period. The amount(s) in Column (g) should be the sum of amounts in Columns (e) and (f).

For supplemental grants and changes to existing grants, do not use Columns (c) and (d). Enter in Column (e) the amount of the increase or decrease of Federal funds and enter in Column (f) the amount of the increase or decrease of non-Federal funds. In Column (g) enter the new total budgeted amount (Federal and non-Federal) which includes the total previous authorized budgeted amounts plus or minus, as appropriate, the amounts shown in Columns (e) and (f). The amount(s) in Column (g) should not equal the sum of amounts in Columns (e) and (f).

Line 5—Show the totals for all columns used.

Section B. Budget Categories

In the column headings (a) through (4), enter the titles of the same programs, functions, and activities shown on Lines 1-4, Column (a), Section A. When additional sheets are prepared for Section A, provide similar column headings on each sheet. For each program, function or activity, fill in the total requirements for funds (both Federal and non-Federal) by object class categories.

Lines 6a-i—Show the totals of Lines 6a to 6h in each column.

Line 6j—Show the amount of indirect cost.

Line 6k—Enter the total of amounts on Lines 6i and 6j. For all applications for new grants and continuation grants the total amount in column (5), Line 6k, should be the same as the total amount shown in Section A, Column (g), Line 5. For supplemental grants and changes to grants, the total amount of the increase or decrease as shown in Columns (1)-(4), Line 6k should be the same as the sum of the amounts in Section A, Columns (e) and (f) on Line 5.

Line 7—Enter the estimated amount of income, if any, expected to be generated from this project. Do not add or subtract this amount from the total project amount. Show under the program narrative statement the nature and source of income. The estimated amount of program income may be considered by the federal grantor agency in determining the total amount of the grant.

Section C. Non-Federal Resources

Lines 8-11—Enter amounts of non-Federal resources that will be used on the grant. If in-kind contributions are included, provide a brief explanation on a separate sheet.

Column (a)—Enter the program titles identical to Column (a), Section A. A breakdown by function or activity is not necessary.

Column (b)—Enter the contribution to be made by the applicant.

Column (c)—Enter the amount of the State's cash and in-kind contribution if the applicant is not a State or State agency. Applicants which are a State or State agencies should leave this column blank.

Column (d)—Enter the amount of cash and in-kind contributions to be made from all other sources.

Column (e)—Enter totals of Columns (b), (c), and (d).

Line 12—Enter the total for each of Columns (b)-(e). The amount in Column (e) should be equal to the amount on Line 5, Column (f) Section A.

Section D. Forecasted Cash Needs

Line 13—Enter the amount of cash needed by quarter from the grantor agency during the first year.

Line 14—Enter the amount of cash from all other sources needed by quarter during the first year.

Line 15—Enter the totals of amounts on Lines 13 and 14.

Section E. Budget Estimates of Federal Funds Needed for Balance of the Project

Lines 16-19—Enter in Column (a) the same grant program titles shown in Column
(a), Section A. A breakdown by function or activity is not necessary. For new applications and continuation grant applications, enter in the proper columns amounts of Federal funds which will be needed to complete the program or project over the succeeding funding periods (usually in years). This section need not be completed for revisions (amendments, changes, or supplements) to funds for the current year of existing grants.
If more than four lines are needed to list the program titles, submit additional schedules as necessary.

Line 20—Enter the total for each of the Columns (b)-(e). When additional schedules are prepared for this Section, annotate accordingly and show the overall totals on this line.

Section F. Other Budget Information

Line 21—Use this space to explain amounts for individual direct object-class cost categories that may appear to be out of the ordinary or to explain the details as required by the Federal grantor agency.

Line 22—Enter the type of indirect rate (provisional, predetermined, final or fixed) that will be in effect during the funding period, the estimated amount of the base to which the rate is applied, and the total indirect expense.

Line 23—Provide any other explanations or comments deemed necessary.

From: Bill Rooney
To: "Kimberly Christiansen"
Subject: RE: INTSORMIL 2009 Request for Annual Project Reports
Date: Sunday, November 08, 2009 9:19:00 AM
Attachments: 2009 Non-Degree Program TAM101.doc
2009 Annual Report TAM 101.doc
2009 Buyins TAM101.doc
2009 Degree Program TAM101.doc

Kim:

Please find attached the appropriate forms/documents for TAM101 report. I'll be working on the regional report next. Hopefully that won't take much longer; I hope to have it to you by the middle of the week.

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

From: Kimberly Christiansen [mailto:kchristiansen@unlnotes.unl.edu]
Sent: Tuesday, September 15, 2009 3:37 PM
To: wlr@tamu.edu; bpendleton@mail.wtamu.edu; hamakerb@purdue.edu; Charles S Wortmann; David S Jackson; gejeta@purdue.edu; Jeff.Wilson@ars.usda.gov; jhancock@ksu.edu; jfl@ksu.edu; jsander1@purdue.edu; lrooney@tamu.edu; erbaugh.1@osu.edu; drmitch@purdue.edu; vara@ksu.edu; sstaggen@ksu.edu; g-peterson1@tamu.edu; gpeterso@ag.tamu.edu; larson.4@osu.edu
Cc: adillwor@purdue.edu; plittlej@tamu.edu
Subject: INTSORMIL 2009 Request for Annual Project Reports

Please note that reports are due November 2, 2009. Thanks.

Date: September 15, 2009

To: INTSORMIL Principal Investigators

Subject: Request for Annual Project Reports (September 30, 2008 – September 29, 2009)

It is once again time to submit your Annual Project reports. **Reports are due November 2, 2009.**

Forms and guidelines are attached, but you may also access the Guidelines and Reporting Forms through the INTSORMIL web site, please go to http://intsormil.org/smformsreports.htm and you will find all the required forms available in PDF and Microsoft Word formats as applicable.

Please follow the instructions on each form. On the Degree and Non-Degree Training Forms, please provide us with complete and accurate information for each section of the form. It is crucial that you provide the individual's name and a **permanent address** for all students and trainees.

Please submit your report via e-mail. Graphs should be submitted as either.jpg, .bmp, or .tif format. The report should be single spaced and no more than ten (10) pages. If you, or your report preparer, have any questions please contact Ms. Kimberly Christiansen by phone at (402) 472-6032 or e-mail at kchristiansen2@unl.edu.

Attached forms:

Project Report Guidelines
Degree Programs (September 30, 2008 – September 29, 2009)
Non-Degree Programs (September 30, 2008 – September 29, 2009)
Buyins (September 30, 2008 – September 29, 2009)

INTSORMIL
Annual Project Report Guidelines

Year 3, September 30, 2008 through September 29, 2009

PROJECT NUMBER: TAM 101

PROJECT TITLE: Breeding Sorghum for Improved Grain and Forage Yield and Quality for Central America.

PRINCIPAL INVESTIGATOR

Dr. William L. Rooney, Plant Breeding and Genetics, Texas A&M University, Department of Soil and Crop Sciences, College Station, TX, 77843-2474, USA.

COLLABORATOR SCIENTISTS

Ing. Reneé Clará Valencia, Plant Breeder, Centro Nacional, de Technologia, Agricola (CENTA) de El Salvador, San Salvador, EL SALVADOR.
Ing. Rafael Obando Solis, Agronomist, CNIA/INTA, Apdo 1247, Managua, Nicaragua
Ing. Antonio J. Cristiani B, President, Semillas Cristiani Burkard, Guatemala, CA
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Dr. Robert R. Klein, Molecular Geneticist, USDA-REEE-ARS-SOA-SCR Lab-CGR, College Station, TX 77845, USA.
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Dr. Joe D. Hancock, Department of Animal Science, Kansas State University, Maniatan, KS

INTRODUCTION and JUSTIFICATION

Background

Throughout Central America, (defined as the countries of Guatamala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica and Panama), sorghum (*Sorghum bicolor* L. Moench)was grown and harvested for grain on approximately 250,000 hectares in 2005 (FAO, 2006). The majority of this production is located in the countries of El Salvador, Nicaragua, Honduras and Guatamala. The crop is typically grown in the dry season due to its enhanced drought tolerance and ability to produce a crop under limited water availability. Average yields in the region vary dramatically and are dependent on the production systems, environment and types of sorghums that are being produced. Depending on the situation, the crop is

grown as a feed grain, animal forage and in many situations as a food grain when supplies of corn are limited.

Within the region, there are two distinct sorghum production systems. The first is a traditional hillside sorghum production system that uses landrace and/or improved sorghum cultivars known as Maicillos Criollos. These sorghums are a very distinct and unique group because they are very photoperiod sensitive, meaning that they require short daylengths to induce reproductive growth. In fact, Maicillos require even shorter daylengths to initiate flowering than most photoperiod sensitive sorghum from other regions of the world (Rosenow, 1988). They are primarily grown in intercropping systems with maize on small, steeply sloping farms where the maize matures before the Maicillos begin to flower. Because they are drought tolerant, they are grown primarily as food security crop where the grain is used extensively primarily to produce tortillas. The forage and excess grain produced by these crops are valued as animal feed. Traditional landrace Maicillos Criollos varieties are typically low yielding with relatively low grain quality. Previous research has resulted in the release and distribution of several improved Maicillos Criollos cultivars with higher yield potential and better grain quality (Rosenow, 1988). In addition to Maicillos Criollos, hillside production systems also utilize earlier maturing sorghum (ie, photoperiod insensitive) for food and forage. Significant research has also been devoted to their improvement, resulting in the release release of cultivars such as Sureno and Tortillero that are now commonly grown throughout the region (Meckenstock et al., 1993). These cultivars have been adopted and used in the region as a food grain on small farms as well as a dual purpose crop (grain, forage) in mid-size commercial farms.

In addition to small farm production, sorghum is also grown in significant quantities on commercial farms in the Central American region. While some of these producers utilize cultivars for this production, most have adopted hybrids and are growing the crop as a feed grain for use in poultry, livestock and dairy production. More recently, there is significant growth of the crop in the region for grazing, hay and silage. This interest in sorghum forage has been increasing due to the increased dairy and beef production in the region, combined with the inherent drought tolerance of the crop, especially in the second, drier cropping season. In both grain and forage, the hybrids that Central American producers use are usually sold by commercial seed companies. In most cases, research and development for sorghum improvement in the region is relatively minimal. Hybrids grown in this region usually rely on improved germplasm from national programs as well as U.S. based sorghum improvement programs.

Problem Statement

While the two production regions differ for types of germplasm, the constraints to productivity and profitability are similar. First, there is a continual need to enhance yield of both grain and biomass. The Maicillos Criollos cultivars have low but stable yield potential. Small farmers place a high value on stable yields as they grown to provide food security. Thus, they will adopt higher yield varieties only if they provide stability of yield as well. As feed grain demand continues to increase, yield increases are also needed in commercial hybrid production as well to make their production more economically profitable. Sufficient genetic variation is present in both germplasm pools to enhance yield potential, provided that effective evaluation, screening and selection can be completed in the region (Santos and Clara, 1988).

Improvement in grain and forage quality are also continually in demand. Most of the grain sorghum grown in the region is acceptable as a feed grain, but would not be acceptable as a food grain. The changes needed to make an acceptable food grain (plant color and grain color) are relatively simple and highly heritable traits that are easily manipulated. If adopted, these changes will facilitate to opportunity to partially substitute domestically produced sorghum flour for more expensive imported wheat flour (INTSORMIL report #6, 2006, www.intsormil.org). However, food quality sorghum must possess resistance to grain mold and weathering to protect the quality of the grain prior to harvest. For forage, there has been relatively little improvement in the forage quality of sorghum grown in Central America. The development and adoption of brown midrib forage sorghums in the U.S. indicate that high quality

forage sorghums can be produced (Oliver et al., 2005). The challenge is to introduce these characteristics into forage sorghum adapted to the Central American region.

As improvements in yield and quality are made, these must be protected from both abiotic and biotic stresses that are commonly present in the region. The predominant abiotic stresses involve drought and fertility and both genetic and agronomic management approaches must be used to mitigate these problems. Biotic stresses also pose a significant threat to yield and quality in sorghum production. In Central America, the predominant SDM pathotype is P5 and this pathotype is known to cause significant yield reductions in areas of the region where environmental conditions are conducive to disease development (Frederiksen, 1988). While chemical control is a possibility, the most logical and reliable control mechanism is the incorporation of genetic resistance. Another disease of importance is anthracnose (caused by *Colletotrichum graminicola*), a fungal pathogen that is capable of infecting all above ground tissues of the plant that is endemic throughout the region. Because it can infect all above ground parts of the plant, it can cause significant reductions in both forage and grain yield and quality. Again, genetic resistance provides the only effective mean of managing this disease. Finally, grain mold (caused by a complex of fungi) is a common problem throughout the region and it reduces the quality of the grain as both a feed and food grain. In all of these abiotic and biotic stresses, sorghum germplasm has sufficient diversity to enable breeding programs to identify and select for tolerance and/or resistance to the specific stress or pathogen.

OBJECTIVES and IMPLEMENTATION SITES

Given the goals of the Sorghum, Millet and Other Grains CRSP and the needs of the Central American region, the overall goal of this proposal is to enhance the genetic yield and quality potential of sorghum genotypes adapted to Central America for use as a feed grain, food grain and forage crop. To meet this goal, we will use previously established linkages with collaborators in the Central American region (i) to coordinate in-country research studies and breeding evaluations, (ii) to identify quality students for training through involvement in ongoing projects at Texas A&M University, and (iii) to enhance technology transfer for sorghum in the Central American region.

The objectives, the location of the research, and the collaborators include:

1. DEVELOP HIGH-YIELDING, LOCALLY-ADAPTED SORGHUM VARIETIES AND HYBRIDS WITH IMPROVED GRAIN AND/OR FORAGE QUALITY, DROUGHT TOLERANCE, AND DISEASE RESISTANCE USING BOTH CONVENTIONAL BREEDING TECHNIQUES AND MARKER-ASSISTED SELECTION TECHNOLOGY. The goal of this objective is to extend the breeding and molecular technology provided by the principal investigator to collaborators to enable the development of new varieties specifically adapted to the Central American region. When successful, this objective will be result in the release of improved, locally-adapted cultivars to be used for grain and/or forage production.

2. IDENTIFY AND MAP GENES RELATED TO FORAGE YIELD AND QUALITY. The purpose of this objective is to understand the genetic control of important components to forage yield and quality and generate genetic markers that can be used by sorghum improvement programs in the near future.

3. IDENTIFY AND CHARACTERIZE GENES RELATED TO DISEASE RESISTANCE IN SORGHUM WITH SPECIFIC EMPHASIS IN DOWNY MILDEW, ANTHRACNOSE AND GRAIN MOLD. UTILIZE THESE SOURCES OF RESISTANCE IN BREEDING IMPROVED CULTIVARS AND HYBRIDS FOR CENTRAL AMERICA. Over the past ten years our program has screened numerous accessions to identify specific sources of resistance to anthracnose, downy mildew and grain mold. These lines and populations derived from them are being evaluated in domestic and Central American sites to determine which sources will provide the most stable resistance.

4. IDENTIFY AND MAP GENES RELATED TO GRAIN QUALITY SUCH PROTEIN DIGESTABILITY, NUTRACEUTICAL POTENTIAL AND GRAIN QUALITY PARAMETERS *PER SE*. Variants that possess unique grain traits such as increased protein digestibility and enhanced antioxidant characters have been identified and characterized in our program. The purpose of this project is to assess the feasibility of producing cultivars that possess these characteristics. In collaboration with the TAMU grain quality program (L. Rooney, D. Hays), we are assessing the feasibility of combining both grain mold resistance and enhanced digestibility.

5. PROVIDE TECHNOLOGY TRANSFER AND TECHNICAL ASSISTANCE IN PROMOTING THE USE OF IMPROVED SORGHUMS AS A FEED GRAIN, FOOD GRAIN AND A FORAGE CROP IN CENTRAL AMERICA. The purpose of this objective is to transfer the technology and knowledge needed to effectively produce and utilize the forage and/or grain produced from the improved sorghum cultivars (Maicillos Criollos, lines and hybrids). As appropriate, our program will coordinate these workshops with collaborating scientists in the specific area of expertise, such as animal feeding (J. Hancock) grain quality and utilization for human food (L Rooney), and agronomy and forage quality (J. Blumenthal). The technical assistance efforts will focus on industry and academic leaders in El Salvador and Nicaragua.

These five objectives merge together to provide a project that will have both short-term and long-term results. Objective 1 is a long-term and continual goal that will utilize the technology developed in objectives 2 through 4 and proven conventional breeding approaches. Objectives 2 through 4 should provide results in the short-term that will be important to work proposed in objective 1. The expected results of objectives 2, 3, and 4 include the identification of DNA-based markers to serve as tags for more efficient breeding. Objective 4 is a medium-term goal that will make the breeding programs and nutritionists more efficient in producing new cultivars that have enhanced market value. Ultimately, the success of objective 1 will be measured by the productivity of cultivars and hybrids developed in this project and how effectively they are utilized throughout Central America. For objectives 1 through 4, training of students from cooperating countries will be an integral part of the projects and potential students will be identified based on recommendations from researchers in the region and the in-country interaction of the PI with potential candidates. Finally, objective 5 is crucial because if the first four objectives are successful, additional sorghum (both forage and grain) with improved quality will be produced. It is imperative that there be the infrastructure (both technological and scientific) to utilize this grain. It should also be realized that while the efforts of this project are primarily targeted to Central America, the technology, basic knowledge, and personnel developed in this project will also be useful to sorghum and millet improvement programs in the United States and around the world. Because of these factors and their interrelationships, this project will address directly or indirectly all seven major goals of the Sorghum, Millet and Other Grains CRSP.

RESEARCH STRATEGY AND APPROACH

1. DEVELOP HIGH-YIELDING, LOCALLY-ADAPTED SORGHUM VARIETIES AND HYBRIDS WITH IMPROVED GRAIN AND/OR FORAGE QUALITY, DROUGHT TOLERANCE, AND DISEASE RESISTANCE USING BOTH CONVENTIONAL BREEDING TECHNIQUES AND MARKER-ASSISTED SELECTION TECHNOLOGY.

Maicillos Criollos Breeding

Because these genotypes are photoperiod sensitive and they are uniquely adapted to the Central America, the breeding must be completed in the region. Segregating populations of breeding material from INTSORMIL was grown and selected in El Salvador for desirability, yield and disease resistance (see Central America Regional Report). On a regular basis these selections are advanced and the most advanced material is evaluated in replicated yield trials. To facilitate future development, a set of advance breeding material was sent to College Station Texas; and breeding crosses were made in

greenhouse and winter nursery sites. These F_1's are being grown in winter nurseries and F_2 populations will be sent to El Salvador for selection in the fall of 2009. Many of these crosses were made between photoperiod sensitive material and photoperiod insensitive types to introduce specific traits such as disease resistance or enhanced forage or grain quality. Emphasis in selection is placed on improved food-type and Macio tan-plant cultivars as well as hybrids (where feasible).

Photoperiod Insensitive Line and Cultivar Breeding

Breeding lines for use as cultivars and/or parents in hybrids will use traditional pedigree breeding approaches, with populations generated from the Texas A&M University/Texas Agricultural Experiment Station sorghum breeding program. Over 3000 segregating rows, ranging from the F2 to the F5 were grown in South Texas for selection. Advanced lines were evaluated for grain yield and adaptation in hybrid combination. The best performing material from these trials is provided to the Central American programs for evaluation and testing in Central America. Traits of emphasis in grain types include but are not limited to grain yield, grain quality, disease resistance and drought tolerance. Traits of emphasis in forage types include but are not limited to biomass yield, forage quality, regrowth potential, foliar disease resistance and drought tolerance.

Forage Sorghum Breeding

Forage sorghums have become increasingly important in the Central American region; development of new varieities and hybrids with improved forage quality are important. Specific improvement involves incorporation of the brown midrib trait into existing and improved cultivars. Segregating progenies have been grown and selections made from these populations in both Texas and El Salvador; these lines are currently in evaluation in both line per se and hybrid combinations. Most of these selections are brown midrib.

2. IDENTIFY AND MAP GENES RELATED TO FORAGE YIELD AND QUALITY.

In both the U.S. and Central America, interest in sorghum as a forage crop (and even as a potential bioenergy crop) has never been greater. In Central America, both CENTA and INTA have released both varieties and hybrids for use as silage and forage crops (see Central America Regional Report). In addition to breeding for standard forage sorghums, our program has provided sudangrass pollinator lines with bmr genotype to the CENTA program; the goal is to develop bmr genotypes for Central America with greater digestability and palatability (Oliver et al., 2005). Additional breeding and evaluation of both bmr lines and corresponding hybrids is ongoing in the Texas A&M program; we have identified numerous combination that have bmr and are agronomically desirable as well.

In addition to breeding efforts, additional information on the genetic basis of biomass yield and how it is partitioned in the plant in botanical terms (stalks, leaves, and panicle) and compositional terms (carbohydrate, protein oil, ash, etc.) is critical to optimize production for specific end uses (forage, grain, or bioenergy). Our program has, in collaboration with researchers at Cornell University, recently published on QTL analysis of biomass partitioning in botanical and compositional terms (Murray et al., 2008a and b). This project identified a total of 145 QTL for 28 biomass and composition related traits. The results indicated that altering genetic potential for non-structural carbohydrate (primarily starch and sugar) as grain and stem sugar yield had greater impact on harvestable energy than altering grain and stem sugar composition. In the leaf and stem structural carbohydrates (ie, lignocelluloses), a total of 158 QTL were detected among the 41 different biomass and composition traits that were measured. Many of these traits co-localized with loci for height, flowering time and density/tillering, indicating a strong albeit not surprising, pleiotrophic effect between these traits.

3. IDENTIFY AND CHARACTERIZE GENES RELATED TO DISEASE RESISTANCE TO ANTHRACNOSE, GRAIN MOLD AND QUALITY, AND SORGHUM DOWNY MILDEW, UTILIZE THESE SOURCES OF RESISTANCE IN BREEDING IMPROVED CULTIVARS AND HYBRIDS FOR CENTRAL AMERICA.

Anthracnose Resistance Mapping

In Central America as well as the southern U.S., anthracnose (caused by *Colletotrichum graminicola*) can be a significant disease of sorghum. The disease can infect all above-ground portions of the plant, although infection in the leaves and stalks is usually the most economically damaging. Due to this, the disease can be very destructive to forage production because even if it does not reduce yield it will reduce forage quality. Over the past ten years, our program has identified new and unique sources of anthracnose resistance and this was highlighted in by Mehta et al. (2005) who described four sources of resistance controlled by different genes and determined that each was highly heritable. Our program has collaborated with molecular geneticists to identify at least one anthracnose resistance locus from SC748-5 to the end of linkage group 5 (Perumal et al., 2008).

Our program is currently expanding efforts in mapping anthracnose resistance; focusing on more detailed mapping of resistance in SC748-5 as well as two other sources. Two different populations were planted for anthracnose evaluation in 2009 in three US locations. Unfortunately, the environments in 2009 were not conducive to the development of the disease and scoring was not possible in the main growing season. Currently, there are plans to repeat this evaluation in 2010.

Sorghum Downy Mildew Resistance

Sorghum Downy Mildew (caused by *Peronosclera sorghii*) is a significant pathogen of sorghum in both Central America and South Texas (Frederiksen, 1988). In endemic areas, the disease can be so severe that genetic resistance is the only effective means of limiting the damage. Fortunately, there are numerous sources of resistance to the disease, but the exact pathotype present in a region determines the best sources of resistance for use in breeding. In Central America, pathotypes 1, 3, and 5 have been identified so sources of resistance to these are critical for the region (Frederiksen, 1988). Previous research (some INTSORMIL funded) has identified several sources of resistance have been identified and within our program. We are continually evaluating and selecting for resistance in this material.

In addition to breeding with existing sources of resistance, there is a need to identify and characterize new and different sources of resistance to the pathogen. Our program has actively conducted SDM screening in Texas for the past five years and has identified a set of material that shows good resistance to at least two different SDM pathotypes (Isakeit and Jaster, 2005). These lines were screened in multiple locations against pathotypes 1, 3 and 6 (Isakeit and Jaster, 2005) and a total of 12 different accessions were identified with resistance. To determine if these sources possess the same source of resistance, they were hybridized in a partial diallel and segregating populations were derived from each. Segregation analysis of these populations indicates that there are at least three different sources of resistance; another is possible but contingent on confirmation with addition crosses that are currently not available. At this time, the plan is to create segregating populations for each unique source to determine the inheritance of the resistance and to transfer it to more adapted and useful germplasm.

4. IDENTIFY AND MAP GENES RELATED TO GRAIN QUALITY SUCH PROTEIN DIGESTABILITY, NUTRACEUTICAL POTENTIAL AND GRAIN QUALITY PARAMETERS *PER SE*.

Our two main projects in grain quality are (1) combining improved protein digestibility with enhanced grain mold resistance and (2) the development and characterization of high antioxidant "healthly" sorghums. Our program, utilizing highly digestible lines from the Purdue University program, has introgressed the highly digestible trait into traditional grain sorghum parental lines in our program. We are currently evaluating these lines for grain mold resistance (summarized by Portillo, 2007). Initial efforts to determine if these two combinations are feasible in the same genotype indicate that they are, to a limited extent. These lines represent an intermediate step in the development of high digestibility sorghums with enhanced grain mold resistance. Because of the increased protein digestibility, it has been hypothesized that they may be more efficient for both malting and ethanol production. In 2008, bulk production of these lines was completed and testing for their efficiency of malting and ethanol production

are being investigated in collaboration with J Taylor (Univ. of Pretoria) and D. Wang (Kansas State Univ.).

Another group of specialty sorghum receiving interest is the health food sorghums. These are grain sorghums with high levels of tannin and/or unique colors (primarily black); they possess very high levels of unique phenolic compounds that show high levels of antioxidant activity. Our program has developed a set of parental lines for use developing a series of lines designed to combine these traits into a single sorghum hybrid that could be grown as a "health" grain. While this does not directly affect efforts within Central America, it does provide the potential opportunity to be used in food products in the area. This work is in cooperation with the TAMU cereal quality lab (L. Rooney) and labs in Central American in CENTA (El Salvador) and at the Escuela Agricola Panamerica (J. Bueso). In 2008 and 2009 our program produced 30 experimental hybrids that were planted in replicated yield trials in four locations (Weslaco, Corpus Christi, College Station, and Halfway, Texas) to evaluate their relative agronomic potential, their antioxidant content and the effect of environment and genotype x environment interaction on those traits. These trials have been harvested and analysis is currently underway. From these trials, it is apparent that both genotype and environment influence antioxidant compound production and degradation and that certain environments are more conducive to their production than others.

5. PROVIDE TECHNOLOGY TRANSFER AND TECHNICAL ASSISTANCE IN PROMOTING THE USE OF IMPROVED SORGHUMS AS A FEED GRAIN, FOOD GRAIN AND A FORAGE CROP IN CENTRAL AMERICA.

Technology transfer in the project is primarily in the form of germplasm supplied to the Central American Program. Our program has sent over 100 different parental lines and germplasm of grain and forage sorghum for evaluation in Central America. Technology generated in this project will be accessible through improved germplasm, both parental lines and cultivars that can be used by small farmers and the seed industry to enhance productivity and quality. Cultivars directed at subsistence production will be distributed in cooperation with National research programs (CENTA in El Salvador and INIA in Nicaragua for example). Lines that have potential as parents in hybrids will be distributed to commercial seed companies (both domestically and internationally); use of these lines in commercial products will require some form of licensing that will be determined on a case by case basis in which the involved parties will write the agreements.

IMPACT

This program focuses on the genetic improvement of sorghum with strong collaborations established with expertise in cereal chemistry, molecular biology, plant pathology, and agronomy. This will provide the critical mass of expertise to address problems that may arise during the research in sorghum. Given the development of sorghum cultivars and hybrids with improved quality and yield potential, and protection from pathogens such as anthracnose and grain mold, these crops should be more competitive with other cereal grains for end-use application in products for human and animal consumption. This is particularly important in the dry season in Central America and the Central U.S. where sorghum are an important cereal grain. Increases in quality will enhance marketing opportunities and the potential for more favorable pricing. This will result in more stable income for producers and processors requiring high-quality grains for product development.

The success of the proposed research will result in technology transfer that includes the development of nutritionally enhanced sorghum lines and hybrids that can be grown in Africa, Central America, and the U.S. as well as technical assistance to effectively utilize these grains in human food and animal feed products. In many developing countries, this research will provide new entrepreneurial opportunities for production of animal feeds and forage as well as other products including meat and eggs. In developed countries such as the U.S., tan-plant sorghum hybrids will have enhanced marketing opportunities to industries that do not currently utilize sorghum or millet grain, particularly the U.S. poultry and food industries.

The genetic analysis described in this proposal will result in a better understanding of the genetic basis and relationship of genes controlling disease resistance (anthracnose, grain mold and SDM), yield (biomass), and quality (forage and grain) and genetic marker associated with each set of genes. These maybe used as markers in MAB and/or useful in isolating the gene sequence provided additional funding and access to the soon to be complete sorghum genome sequence. While this may not have immediate impact on Central America sorghum production, it does impact long term sorghum breeding efforts and that will impact all sorghum production in the future. A key product of this research will be marked "genes" that can be easily transferred to well adapted local cultivars. The need to verify the efficacy of the transferred genes will encourage further collaboration among US and developing country participants.

In addition to providing new cultivars and the technology to utilize them effectively, this training program promotes the development of human capital for enrichment of participating countries. Graduate students and visiting scientists with interest in crop improvement, crop utilization, and molecular biology will complete much of the proposed research. For each objective, as specific research projects are identified, students from target areas will be recruited to conduct this research at Texas A&M University. As appropriate, the students will be expected to collaborate with other investigators within this project and at the other university. This approach should expose the student to interactive and interdisciplinary research that will enhance his/her productivity upon return to their homes.

EVALUATION of PROJECT IMPACT

Crop improvement is a long term, continual process and measuring short term impact is often a challenging, but necessary task. To that end, short-term measurements of impact for this program will include: (1) the number of Material Transfer Agreements written for germplasm produced from this program, (2) the number of publications generated from research in the project, and (3) participation in research workshops and production shortcourses. Over the long-term, progress is easier to quantify and assess the impact. Several of the methods that we will use include: (1) the number of germplasm releases (including parental lines and cultivars) which have been released and may be utilized by subsistence producers and/or commercial seed industry, (2) the number of hectares of a released cultivar and/or hybrid that are being grown in the region (either domestically or internationally), and (3) the production levels of the new varieties and the relative value of that production, and finally (4) to survey potential or actual end-users to determine if the new material has enhance valued for their particular use, and if so, attempt to determine a monetary value to the enhanced value.

TRAINING of U.S. and HOST COUNTRY PERSONNEL

The PI in this project supports the collaborators in both El Salvador and Nicaragua. The PI traveled to Central America to interact, evaluate and collaborate on active research projects in the region. Funds are budgeted for support of a graduate student; it has been extremely difficult to identify acceptable and interested potential students. Mr. Ostilio Portillo, a Honduran will join our program in January 2010 to pursue a Ph.D in plant breeding.

CONTRIBUTION OF PROPOSED RESEARCH to the SORGHUM MILLET and OTHER GRAINS CRSP

The objectives of this proposal are designed (1) to fit precisely within this CRSP's vision, mission and global strategy for research, and (2) to complement and extend the efforts and the expertise of the INTSORMIL research team. The team assembled for this proposal is interdisciplinary and international in nature with a focus on three regions of the world in which INTSORMIL activities are concentrated. The proposed research will result in new and more competitive grain markets for sorghum and pearl millet. Enhanced value of these crops will contribute to a shift of sorghum and pearl millet from subsistence to cash crops in developing countries. Improvements in nutritional as well as grain quality

characteristics (i.e. food-grade sorghums) will make sorghum more competitive with other cereal grains for end-use applications in the U.S. and in host countries. In addition, the development of these value-enhanced grains and the transfer of animal feeding technologies will promote the development of new entrepreneurial opportunities for production of meat and other animal products in countries where these crops are grown. Finally, the development of more competitive sorghum and millet cultivars will allow producers to conserve water resources that would otherwise be used by less water-efficient crops.

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INTSORMIL
Year 3 Activities Supported by Non-CRSP Funding

Principal Investigator: W.L. Rooney **Project No.: TAM 101** **September 30, 2008 – September 29, 2009**

Project Title	Objective of Project	Donor/Sponsor	Funding Level		Start and End Dates
			Current Year	Life of Project	
Development of Sorghums for the Biofuels Industry	Development of Hybrids of sorghum for use in bioenergy production	Ceres, Inc.	$1,000,000 ($300,000 to WLR)	$5,000,000 ($1,500,000 to WLR)	Sept 1, 2007 – August 31, 2012
Bioenergy Sorghum Development	Study of Agronomic Production and Biotic Stresses associated with new sorghum production systems	State of Texas, Texas AgriLife Research; Exceptional Item Cropping Systems.	$125,000 ($25,000 to WLR)	$250,000 ($50,000 to WLR)	Sept 1, 2009 – August 31, 2011
Sweet Sorghums for Ethanol Production	Evaluation of Sweet Sorghum Hybrids for ethanol production	South Central SunGRANT	$125,000 ($20,000 to WLR)	$363,471 ($60,000 to WLR)	July 1, 2007 – June 30, 2010
Comparison of Forage and Bioenercy Composition Estimates utilizing NIR analysis	Complete NIR calibration curves with the same set of samples to estimate the relationship between the two methods	United Sorghum Producers Checkoff	$35,000	$35,000	July 1, 2009 – June 30 2010

INTSORMIL

Year 3 Degree Programs

Principal Investigator: William Rooney **Project No. TAM 101** **September 30, 2008 – September 29, 2009**

Name and Permanent Home Address	Country of Citizenship	Gender	Institution/ Advisor	Beginning and Ending Dates of Degree Program	Purpose of Degree/ Discipline	* Degree	** Funding Type I / P
[redacted] College Station, Texas 77845	USA	Female	W. Rooney	January 2007 to December 2009	Plant Breeding	Ph.D.	P
[redacted] College Station Texas 77845	USA	Male	W. Rooney	August 2008 to May 2010	Plant Breeding	M.S.	P
[redacted] College Station, Texas 77845	USA	Male	W. Rooney	January 2007 to May 2010	Plant Breeding	Ph.D.	P
EXAMPLE: Nouri, Maman INRAN/Maradi BP 429 Niamey, NIGER	Niger	M	Univ of Nebr/Steve Mason	8/07 – 5/08	Crop production/ Agronomy	Ph.D.	I

* **B.S., M.S., Ph.D. = Degree training**

** **I = INTSORMIL funded research assistantship**
P = Partial monetary or research support on INTSORMIL project

INTSORMIL

Year 3 Non-Degree Educational Program

Principal Investigator: William Rooney **Project No. TAM 101** **September 30, 2008 – September 29, 2009**

Name and Permanent Home Address	Country of Citizenship	Gender	Program Site	Date of Program	Name of Conference/Workshop	* Type of Program	** Funding Type I / P
Dr. Nilesh Dighe 3902 College Main Street #304 Bryan, Texas 77801	India	Male	College Station, Texas	April 2008 to December 2009		PD	P
Example							
Mohamed Santini 141 Great Way Brucker, Ghana	Ghana	M	Baton Rouge, Louisiana	2-07 to 2-08	International Workshop on Sorghum and Pearl Millet Breeding	CW	I

***VS = Visiting scientist, i.e., peer scientists, sabbatical leaves, and short-term research programs.**
***PD = Post Doctoral**
***CW = Anyone supported from INTSORMIL project funds attending conferences and/or workshops**

****I = INTSORMIL funded research assistantship**
****P = Partial monetary or research support on INTSORMIL project**

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From: Bill Rooney
To: "Pam Wilhelm"
Subject: RE: OSU money
Date: Thursday, November 05, 2009 5:40:00 PM
Attachments: Sungrant-RooneyTAESTCEv5 revised for award.xls

Pam:

Here is as close as I can get. The attached file has a separate sheet for each PI. I would distribute based on the 2009 budget that is supplied. The total of the individual account comes to about 59K so I'm not real sure where the extra funds are from. I guess you can just put the balance in my account and it'll cover some areas where we are short.

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

-----Original Message-----
From: Pam Wilhelm [mailto:PWilhelm@ag.tamu.edu]
Sent: Wednesday, November 04, 2009 11:14 AM
To: Bill L Rooney
Subject: OSU money

Hey Dr. Rooney, I know I asked you this last month but I didn't make a note of what you said. This account has $62,180.00 in the base account that needs to go to a support account. Right now I have an account for you, Peterson, Blumenthal, Bean. Can you tell me where the money should go?

Salaries $32,545
Travel $4,643
Supplies $8,350.00

Research Project Title:

Composite	2007 6 months Agency	2008 12 months Agency	2009 12 months Agency	2010 6 months Agency	Total 3 years Agency
Personnel					
Undergrad Res Asst	$4,500	$11,000	$11,000	$4,500	$31,000
Graduate Res Asst	$0	$0	$0	$0	$0
Technical Support	$7,704	$16,294	$16,303	$7,716	$48,017
Total Personnel	$12,204	$27,294	$27,303	$12,216	$79,017
Benefits (see note)					
Undergrad @ 8.85%	$398	$974	$974	$398	$2,744
Graduate @ 8.85%+ins.	$0	$0	$0	$0	$0
Technical @16.1%+ins.	$2,603	$5,462	$5,436	$2,577	$16,077
Total Benefits	$3,001	$6,435	$6,409	$2,975	$18,820
Supplies					
Breeding	$4,000	$4,000	$4,000	$2,000	$14,000
Agronomic	$2,500	$5,000	$5,000	$3,500	$16,000
	$1,501	$3,829	$4,000	$2,000	$11,330
Total Supplies	$8,001	$12,829	$13,000	$7,500	$41,330
Travel					
To breeding and agronomic	$2,000	$4,500	$4,000	$2,500	$13,000
test sites for field work					$0
To professional meetings	$0	$0	$500	$0	$500
Total Travel	$2,000	$4,500	$4,500	$2,500	$13,500
Other					
sub to OSU-1	$7,501	$15,000	$15,000	$7,500	$45,001
sub to OSU-2	$3,500	$7,000	$7,000	$3,500	$21,000
sub to NMSU	$4,021	$8,042	$8,042	$4,021	$24,126
sub to KSU	$9,375	$18,750	$18,750	$9,375	$56,250
Total Subcontracts	$24,397	$48,792	$48,792	$24,396	$146,377
TOTAL DIRECT COSTS	$49,603	$99,851	$100,004	$49,587	$299,045
INDIRECT COSTS					
25% TDC	$12,401	$24,963	$25,001	$12,397	$74,761
26% MTDC	$12,897	$25,149	$17,876	$8,505	$64,426
TOTAL PROJECT COSTS	**$62,500**	**$125,000**	**$117,880**	**$58,092**	$363,471

Research Project Title:

Composite	2007	2008	2009	2010	Total
	6 months	12 months	12 months	6 months	3 years
	Agency	Agency	Agency	Agency	Agency
Personnel					
Undergrad Res Asst	$4,050	$9,900	$9,900	$4,050	$27,900
Graduate Res Asst	$0	$0	$0	$0	$0
Technical Support	$6,934	$14,665	$14,673	$6,944	$43,216
Total Personnel	$10,984	$24,565	$24,573	$10,994	$71,116
Benefits (see note)					
Undergrad @ 8.85%	$358	$876	$876	$358	$2,469
Graduate @ 8.85%+ins.	$0	$0	$0	$0	$0
Technical @16.1%+ins.	$2,342	$4,916	$4,892	$2,319	$14,469
Total Benefits	$2,701	$5,792	$5,768	$2,678	$16,938
Supplies					
Breeding	$3,600	$3,600	$3,600	$1,800	$12,600
Agronomic	$2,250	$4,500	$4,500	$3,150	$14,400
	$1,501	$3,446	$3,600	$1,800	$10,347
Total Supplies	$7,351	$11,546	$11,700	$6,750	$37,347
Travel					
To breeding and agronomic	$1,800	$4,050	$3,600	$2,250	$11,700
test sites for field work					$0
To professional meetings	$0	$0	$450	$0	$450
Total Travel	$1,800	$4,050	$4,050	$2,250	$12,150
Other					
sub to OSU-1	$6,751	$13,500	$13,500	$6,750	$40,501
sub to OSU-2	$3,150	$6,300	$6,300	$3,150	$18,900
sub to NMSU	$3,619	$7,238	$7,238	$3,619	$21,713
sub to KSU	$8,438	$16,875	$16,875	$8,438	$50,625
Total Subcontracts	$21,957	$43,913	$43,913	$21,956	$131,739
TOTAL DIRECT COSTS	$44,793	$89,866	$90,004	$44,628	$269,291
INDIRECT COSTS					
25% TDC	$11,198	$22,466	$22,501	$11,157	$67,323
26% MTDC	$11,646	$23,040	$16,153	$7,655	$58,494
TOTAL PROJECT COSTS	**$56,439**	**$112,906**	**$106,157**	**$52,283**	$327,785

Research Project Title:

Blumenthal

	2007	2008	2009	2010	Total
	6 months	12 months	12 months	6 months	3 years
	Agency	Agency	Agency	Agency	Agency
Personnel					
Undergrad Res Asst					$0
Graduate Res Asst					$0
Technical Support	$5,200	$11,300	$11,300	$5,200	$33,000
Total Personnel	$5,200	$11,300	$11,300	$5,200	$33,000
Benefits (see note)					
Undergrad @ 8.85%	$0	$0	$0	$0	$0
Graduate @ 8.85%+ins.	$0	$0	$0	$0	
Technical @16.1%+ins.	$1,682	$3,655	$3,655	$1,682	
Total Benefits	$1,682	$3,655	$3,655	$1,682	$0
Supplies					
Breeding					$0
Agronomic	$1,000	$1,000	$1,000	$1,000	$4,000
Total Supplies	$1,000	$1,000	$1,000	$1,000	$4,000
Travel					
To breeding and agronomic test sites for field work					$0
To professional meetings					$0
Total Travel	$0	$0	$0	$0	$0
TOTAL DIRECT COSTS	$7,882	$15,955	$15,955	$7,882	$47,674
INDIRECT COSTS					
25% of MTDC per ONR	$1,970	$3,989	$3,989	$1,970	$11,918
TOTAL PROJECT COSTS	**$9,852**	**$19,944**	**$19,944**	**$9,852**	$59,592

Research Project Title:

Bean

	2007	2008	2009	2010	Total
	6 months	12 months	12 months	6 months	3 years
	Agency	Agency	Agency	Agency	Agency
Personnel					
Undergrad Res Asst	$2,500	$5,000	$5,000	$2,500	$15,000
Graduate Res Asst					$0
Technical Support					$0
Total Personnel	$2,500	$5,000	$5,000	$2,500	$15,000
Benefits (see note)					
Undergrad @ 8.85%	$221	$443	$443	$221	$1,328
Graduate @ 8.85%+ins.					
Technical @16.1%+ins.					
Total Benefits	$221	$443	$443	$221	$1,328
Supplies					
Breeding	$500	$500	$500	$500	$2,000
Agronomic		$500	$500		$1,000
Total Supplies	$500	$1,000	$1,000	$500	$3,000
Travel					
To breeding and agronomic test sites for field work	$500	$1,000	$1,000	$500	$3,000
To professional meetings	$0	$0	$0	$0	$0
Total Travel	$500	$1,000	$1,000	$500	$3,000
TOTAL DIRECT COSTS	$3,721	$7,443	$7,443	$3,721	$22,328
INDIRECT COSTS					
25% of MTDC per ONR	$930	$1,861	$1,861	$930	$5,582
TOTAL PROJECT COSTS	**$4,652**	**$9,303**	**$9,303**	**$4,652**	$27,909

Research Project Title:

Rooney	2007	2008	2009	2010	Total
	6 months	12 months	12 months	6 months	3 years
	Agency	Agency	Agency	Agency	Agency
Personnel					
Undergrad Res Asst	$2,000	$6,000	$6,000	$2,000	$16,000
Graduate Res Asst					$0
Technical Support					$0
Total Personnel	$2,000	$6,000	$6,000	$2,000	$16,000
Benefits (see note)					
Undergrad @ 8.85%	$177	$531	$531	$177	$1,416
Graduate @ 8.85%+ins.	$0	$0	$0	$0	
Technical @16.1%+ins.					
Total Benefits	$177	$531	$531	$177	$1,416
Supplies					
Breeding	$3,500	$3,500	$3,500	$1,500	$12,000
Agronomic	$1,000	$2,500	$2,500	$2,000	$8,000
Total Supplies	$4,500	$6,000	$6,000	$3,500	$20,000
Travel					
To breeding and agronomic test sites for field work	$1,000	$2,500	$2,000	$1,500	$7,000
To professional meetings	$0		$500	$0	$500
Total Travel	$1,000	$2,500	$2,500	$1,500	$7,500
TOTAL DIRECT COSTS	$7,677	$15,031	$15,031	$7,177	$44,916
INDIRECT COSTS					
25% of MTDC per ONR	$1,919	$3,758	$3,758	$1,794	$11,229
TOTAL PROJECT COSTS	**$9,596**	**$18,789**	**$18,789**	**$8,971**	$56,145

Research Project Title:

Bean	2007	2008	2009	2010	Total
	6 months	12 months	12 months	6 months	3 years
	Agency	Agency	Agency	Agency	Agency
Personnel					
Undergrad Res Asst					$0
Graduate Res Asst					$0
Technical Support	$2,504	$4,994	$5,003	$2,516	$15,017
Jake Robinson--Tech II					
Total Personnel	$2,504	$4,994	$5,003	$2,516	$15,017
Benefits (see note)					
Undergrad @ 8.85%	$0	$0	$0	$0	$0
Graduate @ 8.85%+ins.					
Technical @16.1%+ins.	$921	$1,807	$1,780	$895	$5,403
Total Benefits	$921	$1,807	$1,780	$895	$5,403
Supplies					
Breeding					$0
Agronomic	$500	$1,000	$1,000	$500	$3,000
Total Supplies	$500	$1,000	$1,000	$500	$3,000
Travel					
To breeding and agronomic test sites for field work	$500	$1,000	$1,000	$500	$3,000
To professional meetings	$0			$0	$0
Total Travel	$500	$1,000	$1,000	$500	$3,000
TOTAL DIRECT COSTS	$4,425	$8,801	$8,783	$4,411	$26,421
INDIRECT COSTS					
25% of MTDC per ONR	$1,106	$2,200	$2,196	$1,103	$6,605
TOTAL PROJECT COSTS	**$5,532**	**$11,001**	**$10,979**	**$5,514**	$33,026

Research Project Title:

Bean

2007	2008	2009	2010	Total
6 months	12 months	12 months	6 months	3 years
Agency	Agency	Agency	Agency	Agency

salary	6 mth	12 mth	12 mth	6 mth	
Rooney	2,295	4,612	4,043	1,930	
Bean	2,019	4,000	3,708	1,813	
Peterson	1,770	3,363	3,048	1,524	
Blumenthal	1,844	3,652	3,385	1,655	
subtotal	7,928	15,627	14,185	6,922	
benefits					
Rooney	491	980	853	407	
Bean	444	874	804	393	
Peterson	409	771	693	346	
Blumenthal	416	817	752	367	
subtotal	1,761	3,442	3,101	1,514	
	9,689	19,069	17,285	8,435	54,478

	6 mth
Rooney	.265 mth
Bean	.26 mth
Peterson	.271 mth
Blumenthal	.26 mth

12 mth	12 mth	6 mth	TOTAL
.517 mth	.44 mth	.21 mth	1.442
.5 mth	.45 mth	.22 mth	1.43
.5 mth	.44 mth	.22 mth	1.43
.5 mth	.45 mth	.22 mth	1.43

From:	Bill Rooney
To:	"Pam Wilhelm"
Cc:	"James L Heilman"
Subject:	RE: South Dakota State U account
Date:	Wednesday, November 11, 2009 1:05:00 PM
Attachments:	SF-424A Texas CS - Rooney revised.xls PMC123 Budget Justification Texas CS - Rooney divisors.xls

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Pam:

So, it seems the funds are here, but you can't split because there are not any obvious splits in those ridiculously detailed and stupid forms DOE uses.

The SF424 (attached) split the money into sustainability (83K) and testing (80K). Sustainability goes to Heilman; the remainder stays in my account.

The PMC123 unfortunately combines expenses. So, I've gone in and assigned each item to one of us - look at the justification column (or split between us). Jim, please check and make sure I've got this correct as you remember. You can divide based on this and make splits as appropriate to get 83K to Heilman, leaving me 80K.

Again, sorry for all of this - I hope we are almost finished. Next year we'll do it differently.

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

-----Original Message-----
From: Pam Wilhelm [mailto:PWilhelm@ag.tamu.edu]
Sent: Wednesday, November 11, 2009 12:03 PM
To: James L Heilman; Bill L Rooney
Subject: RE: South Dakota State U account

This is what I found in Laserfiche:
on 9-1-09 they awarded $163,000 with a cost share requirement of $50854 on cost share account . Of that $144670.00 went into the account 0, That would have been what was left when you take the Interim funding to Heilman from the total. All of that was moved to 84720 on 9-28-09. So I'm thinking more of it now needs to be moved to Heilman's to bring his total up to $83,000. But I didn't find a breakdown that shows his budget. I need that in order to know what amounts in what categories go to him.

Back in June of 2009 the interim funding came in to Heilman's $18,330.00. Nothing else has been moved to this account since. This was done by a Award notice sent here.

I did find an award notice dated 11-17-08 where $60,000 was put in and if you add that to the $163000 you get the total awarded of $223,000 that I told you FAMIS showed.

So bottom line is, if one of you can show me a budget that is broken down between the two of you for the $163,000 I can move the rest that goes to Heilman into his support account. I looked through the PDF you sent but I didn't see one broken down by PI Did I just miss it?

>>> "Bill Rooney" <wlr@tamu.edu> 11/11/2009 10:21 AM >>>
Pam:

I'm attaching the proposal for the funding that should have come for the fiscal year that runs from 4/01/09 through 03/31/09. The funding should be subdivided between Heilman and me per the budgets that are provided.

Maybe you can reconcile what we have versus what we don't have in what arrived this year.

Sorry this is such a pain.

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

-----Original Message-----
From: Pam Wilhelm [mailto:PWilhelm@ag.tamu.edu]
Sent: Monday, November 09, 2009 8:07 AM
To: Bill Rooney
Subject: RE: South Dakota State U account

According to FAMIS the total award is $223,000.00. Short Title is Feedstock Partnership Award # 3TA153/Prine: DE-FC36-05G085041
It only has accounts for you and Heilman
Here's the printout of the Summary Budget Pool since the account started:

,SOUTH DAKOTA STATE UNIVERSITY , ,FY 2010
CC,06
Screen:,___,,Account:, ,,Fiscal Year:,2010,
,Thru Month:,11,,November ,,FY/PY/IN to Date:,IN,,Calc CM
IDC:,N
sp Person:,BALTENSPERGER, DAVID, Bottom Line Exclusion:,
0.00
epartment:,SCSC ,Flags: D F B C Z G ABR,, Net Dir BBA:,
129718.24
,Map Code:,50000, ,N N Y R N N 009,,Unprotected Available:,
129718.24

bj	Description,	,Budget	Actual	Encumbrances,,	Available
001	Revenue Pool ,,	223000-	32304-,	,	190696-
***	Total Revenue ,,	223000-	32304-,	,	190696-
	,,	,	,	,	
101	Salaries & Wages Poo,,	79898	13176 ,	7272	59450
000	Travel Pool ,,	12500	2110 ,	,	10390
000	Supplies Pool ,,	27734	3392 ,	,	24342
000	Other Expense Pool ,,	20700	2588 ,	,	18112
000	Capital Outlay Pool ,,	19705	2280	,	17425
**	Total Direct Expense,,	160537	23547 ,	7272	129718

600 Indirect Cost Pool ,, 62463 8837 , , 53626
*** Total Expenses ,, 223000 32384 , 7272 183345
,* Account Total 0 80 7272
7352-

This print out might be easier to see but it's by # not name on the categories

,SOUTH DAKOTA STATE UNIVERSITY , ,FY 2010
CC,06
Screen:,___,,Account:, ,,Fiscal Year:,2010,
,Thru Month:,11,,November ,,FY/PY/IN to Date:,IN,,Calc CM IDC:,N
esp Person:,BALTENSPERGER, DAVID, Bottom Line Exclusion:, 0.00
Department:,SCSC ,Flags: D F B C Z G ABR,, Net Dir BBA:, 129718.24
,Map Code:,50000, ,N,N,Y,R,N,N,009,,Unprotected Available:, 129718.24

Obj	C	P	Budget	CM Actual	Actual	Encumbrances	Available
0001,			223000.00-		32303.67-		190696.33-
****,			223000.00-		32303.67-		190696.33-
, , ,			,				
1101,			79898.00		13176.39	7271.76	59449.85
3000,			12500.00		2110.41		10389.59
4000,			27734.00		3391.75		24342.25
5000,			20700.00	80.00	2588.40		18111.60
8000,			19705.00		2280.05		17424.95
*** ,			160537.00	80.00	23547.00	7271.76	129718.24
9600,			62463.00		8836.67		53626.33
****,			223000.00	80.00	32383.67	7271.76	183344.57
* Total,,			.00	80.00	80.00	7271.76	7351.76-

Let me know if you need anything else or I can help.

>>> "Bill Rooney" <wlr@tamu.edu> 11/5/2009 5:52 PM >>>
Pam:

I've been looking at the SDSU proposal we submitted; the numbers don't match with what you've got listed below. According to the attached, we were due 80K and 83K for me and Heilman respectively. The outlay below is a little over 100K, so it doesn't match.

As far as I know this is the only funds that I have coming from SDSU. Can you reconcile this or give me a title or copy of the budgeting instructions?

Regards,

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
Texas A&M University
College Station, Texas 77843-2474
979 845 2151

-----Original Message-----
From: Pam Wilhelm [mailto:PWilhelm@ag.tamu.edu]
Sent: Thursday, September 10, 2009 9:52 AM
To: Bill L Rooney
Subject: South Dakota State U account

Dr. Rooney, this account has received new funding. I noticed you had set up a support account for Heilman that says Interim funding. Just wanted to check with you as to where the new funds should go.

salary $55036
travel $6500
supplies $10159
other $18516
capital outlay $11040

i. Indirect Costs

	Budget Period 1	Budget Period 2	Budget Period 3	Total
Rate applied:	46.5%	0.0%	0.0%	
Total indirect costs requested:	$59,560			**$59,560**

A federally approved indirect rate agreement, or rate proposed supported and agreed upon by DOE for estimating purposes is required if reimbursement of fringe benfits is requested. Please check (X) one of the options below and provide the requested information if it has not already been provided as requested, or has changed. Calculate the indirect rate dollars and enter the total in the Section B., line 6.j. (Indirect Charges) of form SF 424A.

X **There is a federally approved indirect rate agreement. A copy is provided with this application and will be provided electronically to the Contracting Officer for this project.**

(When this option is selected, a presentation of the budget that demonstrates the application of the approved rate, to arrive at the proposed indirect charges proposed should also be provided.)

_ **There is no current, federally-approved indirect rate agreement.**

(When this option is checked, the entity preparing this form shall submit an indirect cost rate proposal in the format provided at the following website, or in a format that provides the same level of information and which supports the rate(s) being proposed for use in estimating the project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

Additional Explanations/Comments (as necessary)

DHHS Agreement dated January 4, 2008 establishes the indirect cost rate at 46.5% of modified total direct costs.

PMC123.1 - Budget Justification for SF 424A Budget

Instructions and Summary

Award Number: _____ **Date of Submission:** _____

Award Recipient: _____ **Form submitted by:** _____

(May be award recipient or sub-recipient)

Please read the instructions on each page before starting.
If you have any questions, please ask your DOE contact. It will save you time!

On this form, provide detailed support for the estimated project costs identified on the SF-424A form (Budget).

- **The dollar amounts on this page must match the amounts on the associated SF-424A.**
- **The award recipient and each sub-recipient with estimated costs of $100,000 or more must complete this form and a SF-424A form.**
- **The total budget presented on this form and on the SF424A must include both Federal (DOE), and Non-Federal (cost share) portions, thereby reflecting TOTAL PROJECT COSTS proposed.**
- **For costs in each Object Class Category on the SF-424A, complete the corresponding worksheet on this form (tab at the bottom of the page).**
- **All costs incurred by the preparer's sub-recipients, vendors, contractors, consultants and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.**

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

(Note: The values in this summary table are from entries made in each budget category sheet.)

CATEGORY	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Total Costs	Project Costs %	Comments (Add comments as needed)
a. Personnel	$78,389	$0	$0	**$78,389**	**36.7%**	
b. Fringe Benefits	$19,797	$0	$0	**$19,797**	**9.3%**	
c. Travel	$6,500	$0	$0	**$6,500**	**3.0%**	
d. Equipment	$17,205	$0	$0	**$17,205**	**8.0%**	
e. Supplies	$11,703	$0	$0	**$11,703**	**5.5%**	
f. Contractual						
Sub-recipient	*$0*	*$0*	*$0*	*$0*	*0.0%*	
FFRDC	*$0*	*$0*	*$0*	*$0*	*0.0%*	
Vendor	*$0*	*$0*	*$0*	*$0*	*0.0%*	
Total Contractual	$0	$0	$0	**$0**	**0.0%**	
g. Construction	$0	$0	$0	**$0**	**0.0%**	
h. Other Direct Costs	$20,699	$0	$0	**$20,699**	**9.7%**	
i. Indirect Charges	$59,560	$0	$0	**$59,560**	**27.9%**	
Total Project Costs	**$213,853**	**$0**	**$0**	**$213,853**	**100.0%**	

Additional Explanations/Comments (as necessary)

Costs include requested funds and matching funds commitment.

a. Personnel

PLEASE READ!!!

List costs solely for employees of the entity completing this form (award recipient or sub-recipient). All other personnel costs (of subrecipients or other contractual efforts of the entity preparing this) must be included under f., Contractual. This includes all consultants and FFRDCs.

Identify positions to be supported. Key personnel should be identified by title. All other personnel should be identified either by title or a group category. State the amounts of time (e.g., hours or % of time) to be expended, the composite base pay rate, total direct personnel compensation and identify the rate basis (e.g., actual salary, labor distribution report, technical estimate, state civil service rates, etc.).

Add rows as needed. Formulas/calculations will need to be entered by the preparer of this form. Please enter formulas as shown in the example.

Task # and Title	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 3			
1. Generation 2A Receiver Design		**10000**		**$423,000**	**600**		**$24,000**	**800**		**$31,000**	**11400**	**$478,000**	**Actual Salary**
EXAMPLE	Sr. Engineer	2000	$85.00	$170,000	200	$50.00	$10,000	200	$50.00	$10,000	**2400**	**$190,000**	Actual Salary
ONLY!!!	Electrical engineers	6200	$35.00	$217,000	400	$35.00	$14,000	600	$35.00	$21,000	**7200**	**$252,000**	Actual Salary
	Technician	1800	$20.00	$36,000	0	$0.00	$0	0	$0.00	$0	**1800**	**$36,000**	Actual Salary
	Postdoctoral Research Associate	1044	$19.83	$20,700	0	$0.00	$0						Rooney
	Student Worker	480	$11.00	$5,280									Rooney
	Graduate Research Assistants	1566	$15.70	$24,588									Heilman
	Cost Share												
	George L. Hodnett	457	$27.35	$12,500									
	William Rooney 5% time	73	$62.00	$4,500									
	Jim Heilman	104	$49.48	$5,146									
	Frank Hons	104	$54.57	$5,675									

Task # and Title	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 3			
	Total Personnel Costs	3828		$78,389	0		$0	0		$0	0	$78,389	

Additional Explanations/Comments (as necessary)

b. Fringe Benefits

	Budget Period 1	Budget Period 2	Budget Period 3	Total
Rate applied:	25.5%	0.0%	0.0%	
Total fringe requested:	$19,797	$0	$0	**$19,797**

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information, if it has not already been provided to the Contracting Officer, OR if it has changed since it was. Calculate the fringe rate and enter the total amount in Section B, line 6.b. ("Fringe Benefits") of form SF-424A.

X **A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the appliction of the approved rate, to arrive at the proposed fringes benefits dollars should also be provided.)

_____ **There is not a current, federally approved rate agreement negotiated and available.**
(When this option is checked, the entity preparing this form shall submit a rate proposal in the format provided at the following website, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

Additional explanation/comments (as necessary)

c. Travel

PLEASE READ!!!

Provide travel detail as requested below, identifying total Foreign and Domestic Travel as separate items. Purpose of travel are items such as professional conference, DOE sponsored meeting, project management meeting, etc. The Basis for Estimating Costs are items such as past trips, current quotations, Federal Travel Regulations, etc.

All listed travel must be necessary for performance of the Statement of Projecct Objectives.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Budget Period 1							
Domestic Travel							
EXAMPLE ONLY!!! Visit to PV cell mfr. to set up vendor agreement	2			2	$650	$1,300	Internet prices
Travel to Each Location at Harvest	1			3	$1,500	$1,500	Rooney
Travel to SunGrant Meeting	1			3	$2,000	$2,000	Rooney
Travel to Planning Session	1			3	$2,000	$2,000	Rooney
Travel to Other Meeting	1			2	$1,000	$1,000	Rooney
						$0	
						$0	
						$0	
						$0	
Domestic Travel subtotal						$6,500	
International Travel							
						$0	
						$0	
						$0	
						$0	
International Travel subtotal						$0	
Budget Period 1 Total						**$6,500**	

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Budget Period 2							
Domestic Travel							
						$0	
						$0	
						$0	
Domestic Travel subtotal						$0	
International Travel							
						$0	
						$0	
						$0	
						$0	
International Travel subtotal						$0	
Budget Period 2 Total						**$0**	
Budget Period 3							
Domestic Travel							
						$0	
						$0	
						$0	
						$0	
						$0	
						$0	
Domestic Travel subtotal						$0	
International Travel							
						$0	
						$0	
						$0	
						$0	
International Travel subtotal						$0	
Budget Period 3 Total						**$0**	
PROJECT TOTAL						**$6,500**	

Additional Explanations/Comments (as necessary)

d. Equipment

PLEASE READ!!!

Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Further definitions can be found at 10 CFR 600 found on the PMC Recipient Resources Forms page at https://www.eere-pmc.energy.gov/Forms.aspx#regs .

List all proposed equipment below, providing a basis of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying its need as it applies to the Statement of Project Objectives. If it is existing equipment, and the value of its contribution to the project budget is being shown as cost share, provide logical support for the estimated value shown. If it is new equipment which will retain a useful life upon completion of the project, provide logical support for the estimated value shown.

For equipment over $50,000 in price, also include a copy of the associated vendor quote or catalog price list.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Thermal shock chamber	2	$20,000	$40,000	Vendor Quote	Reliability testing of PV modules- Task 4.3
Computer	1	$2,500	$2,500	Standard Estimate	Rooney
NIR Software	1	$7,500	$7,500	Vendor Quote	Rooney
TDR Soil Moisture System	1	$7,205	$7,205	Vendor Quote	Heilman
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 1 Total			$17,205		
Budget Period 2					
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 2 Total			$0		

Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 3					
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 3 Total			$0		
PROJECT TOTAL			**$17,205**		

Additional Explanations/Comments (as necessary)

e. Supplies

PLEASE READ!!!

Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Further definitions can be found at 10 CFR 600 found on the PMC Recipient Resources Forms page at https://www.eere-pmc.energy.gov/Forms.aspx#regs.

List all proposed supplies below, providing a bases of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Wireless DAS components	10	$360.00	$3,600	Catalog price	For Alpha prototype - Task 2.4
Field Costs, including fert., pest, etc	1	$2,548.00	$2,548		heilman
Sample Preparation and Supplies	1	$1,600.00	$1,600		heilman
Weather Station - small equipment	1	$2,400.00	$2,400		heilman
Thermocouple and wire	1	$800.00	$800		heilman
Batteries (12 V deep cycle, etc.)	1	$500.00	$500		heilman
Mateirals for Constructing Static Chambers	1	$2,800.00	$2,800		Heilman
Irrigation supplies	1	$250.00	$250		heilman
Expendables (calibration gases, dessicants, etc.	1	$805.00	$805		Heilman
			$0		
			$0		
Budget Period 1 Total			**$11,703**		
Budget Period 2					
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 2 Total			$0		

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 3					
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 3 Total			$0		
PROJECT TOTAL			**$11,703**		

Additional Explanations/Comments (as necessary)

f. Contractual

PLEASE READ!!!

The entity completing this form must provide all costs related to sub-recipients, vendors, contractors, consultants and FFRDC partners in the applicable boxes below.

Sub-recipients (partners, sub-awardees):

For each sub-recipient with total project costs of $100,000 or more, a separate SF-424A budget and PMC123.1 budget justification form must be submitted. These sub-recipient forms may be completed by either the sub-recipients themselves or by the preparer of this form. The budget totals on the sub-recipient's forms must match the sub-recipeint entries below.

The preparer of this form need only provide further support of the completed sub-recipient budget forms as they deem necessary. The support to justify the budgets of sub-recipients with estimated costs less than $100,000 may be in any format, and at a minimum should provide what Statement of Project Objectives task(s) are being performed, the purpose/need for the effort, and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Vendors (includes contractors and consultants):

List all vendors, contractors and consultants supplying commercial supplies or services used to support the project. The support to justify vendor costs (in any amount) should provide the purpose for the products or services and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Federal Research and Development Centers (FFRDCs):

For FFRDC partners, award recipient will provide a Field Work Proposal (if not already provided with the original application), along with the FFRDC labor mix and hours, by category and FFRDC major purchases greater than $25,000, including Quantity, Unit Cost, Basis of Cost, and Justification. The award recipient may allow the FFRDC to provide this information directly to DOE.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! XYZ Corp.	Partner to develop optimal fresnel lens for Gen 2 product - Task 2.4	$48,000	$32,000	$16,000	**$96,000**
					$0
					$0
					$0
					$0
					$0

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
					$0
					$0
					$0
	Sub-total	$0	$0	$0	$0

Vendor Name/Organization	Product or Service, Purpose/Need and Basis of Cost (Provide additional support at bottom of page as needed)	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! ABC Corp.	Vendor for developing custom robotics to perform lens inspection, alignment, and placement (Task 4). Required for expanding CPV module mfg. capacity. Cost is from competitive quotes.	$32,900	$86,500		**$119,400**
					$0
					$0
					$0
					$0
					$0
					$0
					$0
		$0	$0	$0	$0

FFRDC Name/Organization	Purpose	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
					$0
					$0
					$0
		$0	$0	$0	$0

Total Contractual		$0	$0	$0	$0

AdditionalExplanations/Comments (as necessary)

g. Construction

PLEASE READ!!!

Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient to the award recipient should be entered under f. Contractual.

List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Overall description of construction actiivities:

Example Only!!! - Build wind turbine platform

General Description	Cost	Basis of Cost	Justification of need
Budget Period 1			
Three days of excavation for platform site EXAMPLE ONLY!!!	$28,000	Engineering estimate	Site must be prepared for construction of platform.
Budget Period 1 Total	**$0**		
Budget Period 2			
Budget Period 2 Total	$0		

General Description	Cost	Basis of Cost	Justification of need
Budget Period 3			
Budget Period 3 Total	$0		
PROJECT TOTAL	**$0**		

Additional Explanations/Comments (as necessary)

h. Other Direct Costs

PLEASE READ!!!

Other direct costs are direct cost items required for the project which do not fit clearly into other categories, and are not included in the indirect pool for which the indirect rate is being applied to this project. Examples are meeting costs, postage, couriers or express mail, telephone/fax costs, printing costs, etc.

Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

General description	Cost	Basis of Cost	Justification of need
Budget Period 1			
EXAMPLE ONLY!!! Grad student tuition	$16,000	Established UCD costs	Support of graduate students working on project
Field Equipment Maintance and Cal bration	$6,199	historical data	Rooney
Tractor/Harvest Use/Rental	$3,500	historical data	Rooney
Land Rental and Preparation	$2,000	historical data	Rooney
Tuition - Graduate Students	$9,000	TAMU fees	Heilman/Rooney?
Budget Period 1 Total	$20,699		
Budget Period 2			
Budget Period 2 Total	$0		
Budget Period 3			
Budget Period 3 Total	$0		
PROJECT TOTAL	**$20,699**		

Additional Explanations/Comments (as necessary)

Cost Share

PLEASE READ!!!

A detailed presentation of the cash or cash value of all cost share proposed for the project must be provided in the table below. Identify the source & amount of each item of cost share proposed by the award recipient and each sub-recipient or vendor. Letters of committment must be submitted for all third party cost share (other than award recipient).

Note that "cost-share" is not limited to cash investment. Other items that may be assigned value in a budget as incurred as part of the project budget and necessary to performance of the project, may be considered as cost share, such as: contribution of services or property; donated, purchased or existing equipment; buildings or land; donated, purchased or existing supplies; and/or unrecovered personnel, fringe benefits and indirect costs, etc. For each cost share contribution identified as other than cash, identify the item and describe how the value of the cost share contribution was calculated.

Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include private, state or local Government, or any source not originally derived from Federal funds. Documentation of cost sharing commitments must be provided, if not already provided with the original application and they have not changed since its submission.

Fee or profit will not be paid to the award recipients or subrecipients of financial assistance awards. Additionally, foregone fee or profit by the applicant shall not be considered cost sharing under any resulting award. Reimbursement of actual costs will only include those costs that are allowable and allocable to the project as determined in accordance with the applicable cost principles prescribed in 10 CFR 600.127, 10 CFR 600.222 or 10 CFR 600.317. Also see 10 CFR 600.318 relative to profit or fee.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Organization/Source	Type (cash or other)	Cost Share Item	Budget Period 1 Cost Share	Budget Period 2 Cost Share	Budget Period 3 Cost Share	Total Project Cost Share
ABC Company **EXAMPLE ONLY!!!**	Cash	Project partner ABC Company will provide 40 PV modules for product development at 50% off the of the retail price of $680	$13,600			**$13,600**
	other	Salaries of George L. Hodnett, William L. Rooney Jim Heilman, and Frank Hons plus fringe benfits and indirect costs	$50,853			**$50,853**
						$0
						$0
						$0
						$0
						$0

Organization/Source	Type (cash or other)	Cost Share Item	Budget Period 1 Cost Share	Budget Period 2 Cost Share	Budget Period 3 Cost Share	Total Project Cost Share
						$0
						$0
						$0
						$0
		Totals	$50,853	$0	$0	$50,853

Total Project Cost: $213,853 **Cost Share Percent of Award: 23.8%**

Additional Explanations/Comments (as necessary)

Applicant Name: Texas AgriLife Research Award Number:

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Feedstock Trial and Management				$80,000	$31,383	$111,383
2. Sustainability				$83,000	$19,471	$102,471
3.						$0
4.						$0
5. Totals		$0	$0	$163,000	$50,854	$213,854

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity				Total (5)
	(1) Request	(2) Match	(3)	(4)	
a. Personnel	$50,568	$27,821			$78,389
b. Fringe Benefits	$12,906	$6,892			$19,798
c. Travel	$6,500	$0			$6,500
d. Equipment	$17,205	$0			$17,205
e. Supplies	$11,703	$0			$11,703
f. Contractual	$0	$0			$0
g. Construction	$0	$0			$0
h. Other	$20,699	$0			$20,699
i. Total Direct Charges (sum of 6a-6h)	$119,581	$34,713	$0	$0	$154,294
j. Indirect Charges	$43,419	$16,141			$59,560
k. Totals (sum of 6i-6j)	$163,000	$50,854	$0	$0	$213,854
7. Program Income	$0	$0			$0

Previous Edition Usable

SF-424A (Rev. 4-92)
Prescribed by OMB Circular A-102

Section C - Non-Federal Resources					
(a) Grant Program		(b) Applicant	(c) State	(d) Other Sources	(e) Totals
8.		$50,854			$50,854
9.					$0
10.					$0
11.					$0
12. Total (sum of lines 8 - 11)		$50,854	$0	$0	$50,854

Section D - Forecasted Cash Needs					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th quarter
13. Federal	$163,000	$40,750	$40,750	$40,750	$40,750
14. Non-Federal	$50,854	$12,713.50	$12,713.50	$12,713.50	$12,713.50
15. Total (sum of lines 13 and 14)	$213,854	$53,464	$53,464	$53,464	$53,464

Section E - Budget Estimates of Federal Funds Needed for Balance of the Project				
	Future Funding Periods (Years)			
(a) Grant Program	(b) First	(c) Second	(d) Third	(e) Fourth
16.				
17.				
18.				
19.				
20. Total (sum of lines 16-19)	$0	$0	$0	$0

Section F - Other Budget Information	
21. Direct Charges	22. Indirect Charges
Requested Funds - $119,581; Match - $34,712	Requested Fund - $43,419; Match - $16,141

23. Remarks

DHHS negotiated rate agreement dated January 4, 2008 establishes the institutional indirect cost rate at 46.5% of modified total direct costs.

Instructions for the SF-424A

General Instructions

This form is designed so that application can be made for funds from one or more grant programs. In preparing the budget, adhere to any existing Federal grantor agency guidelines which prescribe how and whether budgeted amounts should be separately shown for different functions or activities within the program. For some programs, grantor agencies may require budgets to be separately shown by function or activity. For other programs, grantor agencies may require a breakdown by function or activity. Sections A, B, C, and D should include budget estimates for the whole project except when applying for assistance which requires Federal authorization in annual or other funding period increments. In the later case, Sections A, B, C, and D should provide the budget for the first budget period (usually a year) and Section E should present the need for Federal assistance in the subsequent budget periods. All applications should contain a breakdown by the object class categories shown in Lines a-k of Section B.

Section A. Budget Summary Lines 1-4 Columns (a) and (b)

For applications pertaining to a **single** Federal grant program (Federal Domestic Assistance Catalog number) and **not requiring** a functional or activity breakdown, enter on Line 1 under Column (a) the catalog program title and the catalog number in Column (b).

For applications pertaining to a **single** program **requiring** budget amounts by multiple functions or activities, enter the name of each activity or function on each line in Column (a), and enter the catalog number in Column (b). For applications pertaining to multiple programs where none of the programs require a breakdown by function or activity, enter the catalog program title on each line in **Column** (a) and the respective catalog number on each line in Column (b).

For applications pertaining to **multiple** programs where one or more programs **require** a breakdown by function or activity, prepare a separate sheet for each program requiring the breakdown. Additional sheets should be used when one form does not provide adequate space for all breakdown of data required. However, when more than one sheet is used, the first page should provide the summary totals by programs.

Lines 1-4, Columns (c) through (g)

For new applications, leave Columns (c) and (d) blank. For each line entry in Columns (a) and (b), enter in Columns (e), (f), and (g) the appropriate amounts of funds needed to support the project for the first funding period (usually a year).

For continuing grant program applications, submit these forms before the end of each funding period as required by the grantor agency. Enter in Columns (c) and (d) the estimated amounts of funds which will remain unobligated at the end of the grant funding period only if the Federal grantor agency instructions provide for this. Otherwise, leave these columns blank. Enter in columns (e) and (f) the amounts of funds needed for the upcoming period. The amount(s) in Column (g) should be the sum of amounts in Columns (e) and (f).

For supplemental grants and changes to existing grants, do not use Columns (c) and (d). Enter in Column (e) the amount of the increase or decrease of Federal funds and enter in Column (f) the amount of the increase or decrease of non-Federal funds. In Column (g) enter the new total budgeted amount (Federal and non-Federal) which includes the total previous authorized budgeted amounts plus or minus, as appropriate, the amounts shown in Columns (e) and (f). The amount(s) in Column (g) should not equal the sum of amounts in Columns (e) and (f).

Line 5—Show the totals for all columns used.

Section B. Budget Categories

In the column headings (a) through (4), enter the titles of the same programs, functions, and activities shown on Lines 1-4, Column (a), Section A. When additional sheets are prepared for Section A, provide similar column headings on each sheet. For each program, function or activity, fill in the total requirements for funds (both Federal and non-Federal) by object class categories.

Lines 6a-i—Show the totals of Lines 6a to 6h in each column.

Line 6j—Show the amount of indirect cost.

Line 6k—Enter the total of amounts on Lines 6i and 6j. For all applications for new grants and continuation grants the total amount in column (5), Line 6k, should be the same as the total amount shown in Section A, Column (g), Line 5. For supplemental grants and changes to grants, the total amount of the increase or decrease as shown in Columns (1)-(4), Line 6k should be the same as the sum of the amounts in Section A, Columns (e) and (f) on Line 5.

Line 7—Enter the estimated amount of income, if any, expected to be generated from this project. Do not add or subtract this amount from the total project amount. Show under the program narrative statement the nature and source of income. The estimated amount of program income may be considered by the federal grantor agency in determining the total amount of the grant.

Section C. Non-Federal Resources

Lines 8-11—Enter amounts of non-Federal resources that will be used on the grant. If in-kind contributions are included, provide a brief explanation on a separate sheet.

Column (a)—Enter the program titles identical to Column (a), Section A. A breakdown by function or activity is not necessary.

Column (b)—Enter the contribution to be made by the applicant.

Column (c)—Enter the amount of the State's cash and in-kind contribution if the applicant is not a State or State agency. Applicants which are a State or State agencies should leave this column blank.

Column (d)—Enter the amount of cash and in-kind contributions to be made from all other sources.

Column (e)—Enter totals of Columns (b), (c), and (d).

Line 12—Enter the total for each of Columns (b)-(e). The amount in Column (e) should be equal to the amount on Line 5, Column (f) Section A.

Section D. Forecasted Cash Needs

Line 13—Enter the amount of cash needed by quarter from the grantor agency during the first year.

Line 14—Enter the amount of cash from all other sources needed by quarter during the first year.

Line 15—Enter the totals of amounts on Lines 13 and 14.

Section E. Budget Estimates of Federal Funds Needed for Balance of the Project

Lines 16-19—Enter in Column (a) the same grant program titles shown in Column
(a), Section A. A breakdown by function or activity is not necessary. For new applications and continuation grant applications, enter in the proper columns amounts of Federal funds which will be needed to complete the program or project over the succeeding funding periods (usually in years). This section need not be completed for revisions (amendments, changes, or supplements) to funds for the current year of existing grants.
If more than four lines are needed to list the program titles, submit additional schedules as necessary.

Line 20—Enter the total for each of the Columns (b)-(e). When additional schedules are prepared for this Section, annotate accordingly and show the overall totals on this line.

Section F. Other Budget Information

Line 21—Use this space to explain amounts for individual direct object-class cost categories that may appear to be out of the ordinary or to explain the details as required by the Federal grantor agency.

Line 22—Enter the type of indirect rate (provisional, predetermined, final or fixed) that will be in effect during the funding period, the estimated amount of the base to which the rate is applied, and the total indirect expense.

Line 23—Provide any other explanations or comments deemed necessary.

Form **W-9**
(Rev. October 2007)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give form to the requester. Do not send to the IRS.

Print or type See **Specific Instructions** on page 2.

Name (as shown on your income tax return)

Business name, if different from above

Check appropriate box: ☐ Individual/Sole proprietor ☐ Corporation ☐ Partnership
☐ Limited liability company. Enter the tax classification (D=disregarded entity, C=corporation, P=partnership) ▶
☐ Other (see instructions) ▶

☐ Exempt payee

Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

City, state, and ZIP code

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number

or

Employer identification number

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here **Signature of U.S. person ▶** **Date ▶**

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,

- The U.S. grantor or other owner of a grantor trust and not the trust, and
- The U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person, do not use Form W-9. Instead, use the appropriate Form W-8 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity not subject to backup withholding, give the requester the appropriate completed Form W-8.

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See the instructions below and the separate Instructions for the Requester of Form W-9.

Also see *Special rules for partnerships* on page 1.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Name

If you are an individual, you must generally enter the name shown on your income tax return. However, if you have changed your last name, for instance, due to marriage without informing the Social Security Administration of the name change, enter your first name, the last name shown on your social security card, and your new last name.

If the account is in joint names, list first, and then circle, the name of the person or entity whose number you entered in Part I of the form.

Sole proprietor. Enter your individual name as shown on your income tax return on the "Name" line. You may enter your business, trade, or "doing business as (DBA)" name on the "Business name" line.

Limited liability company (LLC). Check the "Limited liability company" box only and enter the appropriate code for the tax classification ("D" for disregarded entity, "C" for corporation, "P" for partnership) in the space provided.

For a single-member LLC (including a foreign LLC with a domestic owner) that is disregarded as an entity separate from its owner under Regulations section 301.7701-3, enter the owner's name on the "Name" line. Enter the LLC's name on the "Business name" line.

For an LLC classified as a partnership or a corporation, enter the LLC's name on the "Name" line and any business, trade, or DBA name on the "Business name" line.

Other entities. Enter your business name as shown on required federal tax documents on the "Name" line. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on the "Business name" line.

Note. You are requested to check the appropriate box for your status (individual/sole proprietor, corporation, etc.).

Exempt Payee

If you are exempt from backup withholding, enter your name as described above and check the appropriate box for your status, then check the "Exempt payee" box in the line following the business name, sign and date the form.

Generally, individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends.

Note. If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding.

The following payees are exempt from backup withholding:

1. An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2),

2. The United States or any of its agencies or instrumentalities,

3. A state, the District of Columbia, a possession of the United States, or any of their political subdivisions or instrumentalities,

4. A foreign government or any of its political subdivisions, agencies, or instrumentalities, or

5. An international organization or any of its agencies or instrumentalities.

Other payees that may be exempt from backup withholding include:

6. A corporation,

7. A foreign central bank of issue,

8. A dealer in securities or commodities required to register in the United States, the District of Columbia, or a possession of the United States,

9. A futures commission merchant registered with the Commodity Futures Trading Commission,

10. A real estate investment trust,

11. An entity registered at all times during the tax year under the Investment Company Act of 1940,

12. A common trust fund operated by a bank under section 584(a),

13. A financial institution,

14. A middleman known in the investment community as a nominee or custodian, or

15. A trust exempt from tax under section 664 or described in section 4947.

The chart below shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 15.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 9
Broker transactions	Exempt payees 1 through 13. Also, a person registered under the Investment Advisers Act of 1940 who regularly acts as a broker
Barter exchange transactions and patronage dividends	Exempt payees 1 through 5
Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 7[2]

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation (including gross proceeds paid to an attorney under section 6045(f), even if the attorney is a corporation) and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, and payments for services paid by a federal executive agency.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited liability company (LLC)* on page 2), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local Social Security Administration office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting *www.irs.gov* or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded domestic entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, and 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). Exempt payees, see *Exempt Payee* on page 2.

Signature requirements. Complete the certification as indicated in 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account [1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor [2]
4. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee [1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner [1]
5. Sole proprietorship or disregarded entity owned by an individual	The owner [3]
For this type of account:	**Give name and EIN of:**
6. Disregarded entity not owned by an individual	The owner
7. A valid trust, estate, or pension trust	Legal entity [4]
8. Corporate or LLC electing corporate status on Form 8832	The corporation
9. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
10. Partnership or multi-member LLC	The partnership
11. A broker or registered nominee	The broker or nominee
12. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or "DBA" name on the second name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 1.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, social security number (SSN), or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

Call the IRS at 1-800-829-1040 if you think your identity has been used inappropriately for tax purposes.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov.* You may also report misuse of the IRS name, logo, or other IRS personal property to the Treasury Inspector General for Tax Administration at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.consumer.gov/idtheft* or 1-877-IDTHEFT(438-4338).

Visit the IRS website at *www.irs.gov* to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons who must file information returns with the IRS to report interest, dividends, and certain other income paid to you, mortgage interest you paid, the acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA, or Archer MSA or HSA. The IRS uses the numbers for identification purposes and to help verify the accuracy of your tax return. The IRS may also provide this information to the Department of Justice for civil and criminal litigation, and to cities, states, the District of Columbia, and U.S. possessions to carry out their tax laws. We may also disclose this information to other countries under a tax treaty, to federal and state agencies to enforce federal nontax criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism.

You must provide your TIN whether or not you are required to file a tax return. Payers must generally withhold 28% of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to a payer. Certain penalties may also apply.