From: Bill Rooney
To: "Anna J Fox"; "Kathy Ferguson"
Subject: agro 642 transparencies
Date: Thursday, November 05, 2009 7:16:00 AM
Attachments: Lecture 14 - QTL MAS.docx

Anna and/or Kathy

Could you help me out and make transpencies of the attached word document?

I need them for class this morning. I'll be by around 9:30 (just before class).

Thanks so much.

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

Agro 642 – Mapping Genes (Qualitative and Quantitative)

I. Molecular Markers and Genetic Markers
   a. Many types of markers but type is not important in this class
   b. Type of Map its creation and marker density is more critical and its applicability to your breeding program is most important.
      i. Use to be that type of map was critical, now you can create a map and collect data at the same time.
         1. Exotic by Elite
         2. Elite by Elite
         3. Best – population in which you are working
      ii. Still need adequate polymorphism and recombination to create a linkage map.
      iii. Linkage map
      iv. Physical Map reconciles cytogenetic and linkage map
      v. Sequence Map when genome is sequenced.

II. Qualitative Traits – relatively straightforward, key is applicability of markers to all breeding populations, not just the ones in which mapping was completed.
   a. Create Population (bot
      i. F2
      ii. BC
      iii. RIL (limited need)
   b. Phenotype – Has become the most limiting factor. All of the mapping and inferences taken in this work is based on accurate phenotypic evaluation of the traits.
   c. Genotype – See above, but create linkage map and then use a particular approach to detect marker-QTL associations.
   d. Marker-assisted breeding for qualitative traits is quite common in commercial programs. Used for confirmation of hybrids in breeding programs, MAB for disease resistance, height, maturity etc. Balance of use is defined by relative cost/benefit of use of markers. Common, have a marker in the locus for applicability across all populations.

III. Quantitative Traits – QTL Linkage
   a. Relies on differences among the trait means of genotypes at a marker locus. (See Fig. 13.4)
   b. Means associated with a marker
      i. BC (Table 13.1)
      ii. F2 (Table 13.2)
      iii. RIL
      iv. Testcrosses

TABLE 13.1. Marker and QTL genotypes in a BC_1 population.

Gamete from F_1	Frequency	Genotype in BC_1	Genotypic value
MQ	$\frac{1}{2}(1-r)$	$MmQq$	$\overline{P}+d$
Mq	$\frac{1}{2}r$	$Mmqq$	$\overline{P}-a$
mQ	$\frac{1}{2}r$	$mmQq$	$\overline{P}+d$
mq	$\frac{1}{2}(1-r)$	$mmqq$	$\overline{P}-a$

(i.e., Mq and mQ) is $\frac{1}{2}r$ (Table 13.1). Among the Mm individuals in the BC_1 population, a proportion equal to $1-r$ will have the Qq genotype, whereas a proportion equal to r will have the qq genotype. The mean of the Mm individuals for the quantitative trait is therefore

$$\overline{Mm} = \overline{P} + (1-r)d - ra$$

The mean of the mm individuals in the BC_1 population is

$$\overline{mm} = \overline{P} + rd - (1-r)a$$

The difference between the means of the Mm and mm individuals is

$$(\overline{Mm} - \overline{mm}) = (a+d)(1-2r) \tag{13.1}$$

A significant difference between $\overline{Mm}$ and $\overline{mm}$ would therefore indicate the presence of a linked QTL. Suppose that $N = 100$ soybean BC_1 individuals with the Mm genotype have a mean protein concentration of 340 g kg^{-1} and a sample variance of $\widehat{V}(Mm) = 100$. In contrast, $N = 100$ individuals with the mm genotype have a mean of 330 g kg^{-1} and a sample variance of $\widehat{V}(mm) = 80$. The t-statistic is calculated as

$$\begin{aligned} t &= \frac{\overline{Mm} - \overline{mm}}{\sqrt{\frac{\widehat{V}(Mm)}{N} + \frac{\widehat{V}(mm)}{N}}} \\ &= \frac{340 - 330}{\sqrt{\frac{100}{100} + \frac{80}{100}}} \\ &= 7.45, \text{ significant at } 1\% \end{aligned}$$

Eq. 13.1 indicates that the difference between $\overline{Mm}$ and $\overline{mm}$ is zero when the marker and the QTL are unlinked, i.e., $r = 0.50$. Eq. 13.1 reduces to $a(1-2r)$ when dominance is absent, i.e., $d = 0$. The difference between

TABLE 13.2. Values and frequencies of QTL genotypes in an F_2 population.

Marker		Conditional frequency:		
Genotype	Frequency	QQ	Qq	qq
MM	$\frac{1}{4}$	$(1-r)^2$	$2r(1-r)$	r^2
Mm	$\frac{1}{2}$	$r(1-r)$	$1-2r+2r^2$	$r(1-r)$
mm	$\frac{1}{4}$	r^2	$2r(1-r)$	$(1-r)^2$
Value of F_2 individuals		$\overline{P}+a$	$\overline{P}+d$	$\overline{P}-a$
Value of S_1 families		$\overline{P}+a$	$\overline{P}+\frac{1}{2}d$	$\overline{P}-a$
Value of F_2 testcrosses		$\overline{P}+a_T$	$\overline{P}$	$\overline{P}-a_T$

50% lower among S_1 families than among F_2 individuals (Table 13.2):

$$\begin{aligned}
\overline{MM}(S_1) &= \overline{P} + a(1-2r) + r(1-r)d \\
\overline{Mm}(S_1) &= \overline{P} + \frac{1}{2}d(1-2r+2r^2) \\
\overline{mm}(S_1) &= \overline{P} - a(1-2r) + r(1-r)d
\end{aligned}$$

The difference between the S_1 family means of the homozygous marker genotypes remains

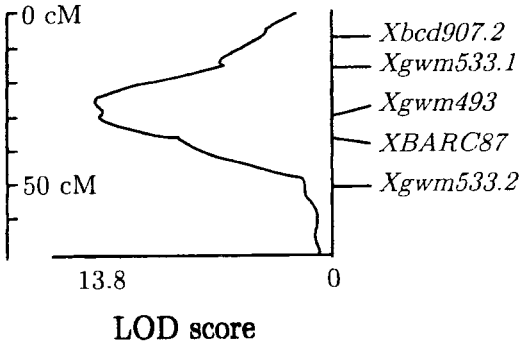
$$(\overline{MM} - \overline{mm})_{S_1} = 2a(1-2r) \tag{13.3}$$

whereas the difference between the mean of the heterozygote and the mid-parent of the two homozygotes is

$$(\overline{Mm} - \frac{\overline{MM} + \overline{mm}}{2})_{S_1} = \frac{1}{2}d(1-2r)^2$$

c. Single Factor Analysis
    i. detection of QTL by considering one marker at a time. You look for differences among marker classes by means MM, Mm, and mm using t-tests, F-tests.
    ii. Problems
        1. Location of the QTL relative to the marker cannot be determined because the recombination frequency is confounded with genotypic values.
        2. Two or more markers could detect either the same QTL or different QTL and there is no way to determine number and relative magnitude.
        3. You must use other approaches to identify number, relative magnitude and most likely location of the QTL.

d. Interval Mapping – estimates the location of a QTL relative to a marker to its left and right (flanking markers).



    i. Utilizes developed software packages like MapMaker/QTL. Interval mapping uses maximum likelihood to estimate most probable location. Calculation of a LOD score (logarithm of odds). The largest LOD score represents the most likely location of a QTL. (Figure 13.5)
    ii. Regression approach to interval mapping. Similar to above but uses regression analysis assuming the QTL is located between the markers – the location that results in the lowest residual sums of squares is the most likely location of the QTL
    iii. Both types are applicable to the most likely interaction between QTL on the same chromosome or linkage block.
    iv. The weakness of interval mapping is that it can create ghost QTL due to the location of two independent but linked QTL. (Figure 13.6)

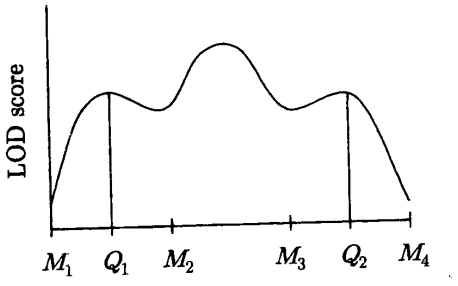


FIGURE 13.6. Ghost QTL from interval mapping.

e. Multiple Marker Analysis
    i. To avoid ghost QTL, analysis of three different loci are needed.
    ii. Joint mapping (marker difference regression) simultaneously analyzes all the markers on a given

chromosome (works on the basis of a independent linkage groups for joint mapping).

1. For each marker calculate the phenotypic means for MM and mm genotypes.
2. When significant, assume a QTL at a particular position on the chromosome.
3. Calculate 1-2ri b/n the assumed QTL position and the known position of each marker on the chromosome

4. Fit a regression model with x and y where
    a. X is the independent variable(s) with 1-2ri values
    b. Y is the dependent variable containing the values of MM – mm
5. Repeat steps 2 to 4 using different assumed positions for the QTL. The QTL position that leads to the lowest residual sum of square correspond to the QTL loctation

iii. Standard Multiple Regression – useful to isolate QTL (see Fig. 13.7)

iv. Composite Interval Mapping involves the use of interval mapping and multiple regression. Combines the strengths of both, but like all; until a QTL is isolated and it assumes that only a single QTL is present in the marker interval. Other situations are confounded and number effect and position of multiple QTL cannot be determined.

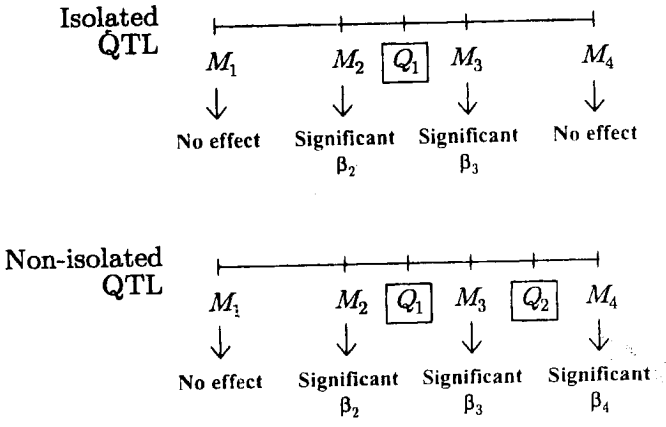


FIGURE 13.7. Isolated versus non-isolated QTL.

IV. Declaring Significance and False Positives

a. Results of Statistical Test

i. Correct Interpretation (Figure 13.8)

1. True Positives

2. True Negative
3. False Positive – a QTL is incorrectly declared present. Type I error
4. False Negative – a QTL is incorrectly declared absent. Type II error

ii. Error Rate
1. Comparison-wise Error Rate
2. Experiment-wise Error Rate
3. Permutation testing for setting significance levels.

iii. Decisions on appropriate level of significance
1. Balancing Type I or Type II error rates.
2. Depends on Goals
3. Stringent Type I for mapping and cloning genes
4. Stringent Type II for MAB

power of the statistical ...

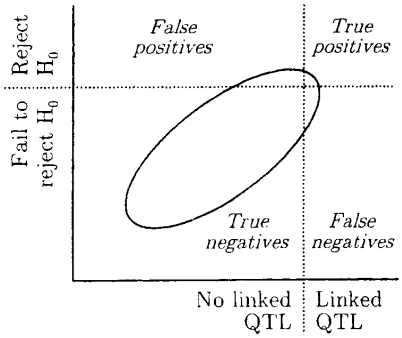


FIGURE 13.8. Outcomes of a test for the presence of a linked QTL.

V. Marker Based and/or Assisted Selection for QTL
a. Consistency of QTL – you can always find a QTL, but can you find the same QTL twice. Results of Beavis et al. (1994) are typical and you can find numerous examples in the literature.
b. Possible reasons for difference

TABLE 14.1. QTL detected in two independent samples of the (B73 × Mo17)F_2 maize population (data from Beavis, 1994).

Trait	Chromosome (flanking markers)	Phenotypic variation due to QTL (%) Iowa State Univ.	Pioneer Hi-Bred
Plant height	1 (php1122,bnl7.21)	17	7
	1 (bnl8.10,php20518)	16	–
	2	–	8
	3 (bnl8.35,umc10)	–	10
	3 (umc60,bnl6.16)	9	–
	4	–	5
	6	4	–
	8	7	–
	9	–	10
	10	–	12
Yield	1 (umc13,php1122)	14	–
	1 (bnl8.10,php20518)	–	8
	2 (umc34,php10012)	26	
	2 (umc36,php20622)	–	10
	3	7	–
	4	–	7
	5	–	9
	6	6	–
	8	13	–
	9	–	23

i. Environment
ii. Different progenies (same cross) Mo17/B73
iii. Different generations F4 (112) vs. F3 (100)
iv. Which is the reason?

c. Beavis recreated the same population and mapped plant height in a population of 400. He also randomly subdivided the 400 into four subsets of 100 and mapped QTL in the subsets. He proposed that the differences were primarily due to sampling

Table 4—Estimated phenotypic variability explained by significant plant height QTL identified using 400 $F_{2:3}$ lines (complete set) and four subsets of 100 $F_{2:3}$ lines from B73 × Mo17 SYN4 population (Covarrubius-Prieto et al., 1989). Lines were evaluated for plant height at four environments in Iowa and Illinois in 1991 and 1992

Chromosome	Flanking Markers	Complete	Subset 1	Subset 2	Subset 3	Subset 4
1	php1122/bnl7.21	3	—	—	—	—
1	bnl8.10/php20518	—	—	—	—	—
2	umc131/php20005	—	—	—	—	—
3	bnl8.35/umc10	4	—	10	8	—
3	umc60/bnl6.16	—	—	—	—	—
4	umc42/umc19	—	—	—	—	—
6	umc62/php20599	—	—	—	—	17
8	bnl12.30/bnl10.24	7	—	15	13	13
9	wx1/css1	8	17	—	16	23
10	php15013/php10033	—	—	—	—	—

d. Melchinger (1998) reported similar results; power to detect QTL dropped with sample size
i. 344 families, detected 107 QTL for agronomic traits
ii. 107 families, detected only 39 QTL for agronomic traits

e. Lande and Thompson (1990) power to detect QTL a function of
i. Size of the mapping population (greater size, greater power)
ii. Heritability of the trait (higher heritability, greater power because the phenotype is more accurate).

f. HOW BIG? Beavis conducted a simulation study.
i. QTL, no epistasis and no linkage and equal effect
1. 10
2. 40
ii. Heritability
1. 30
2. 65
3. 90
iii. Population Sized
1. 100

2. 500
3. 1000

iv. Power – ability to accurately identify real QTLs

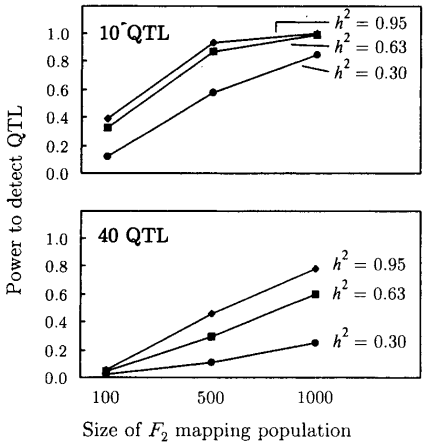


FIGURE 14.1. Power to detect QTL when 10 or 40 QTL control the trait (data from Beavis, 1994).

v. Conclusions
   1. Most every QTL found was real, but sampling and error reduce ability and power to detect all QTL.
   2. In this situation the relative impact of each QTL is subsequently overestimated with increased bias as sample sizes become smaller.

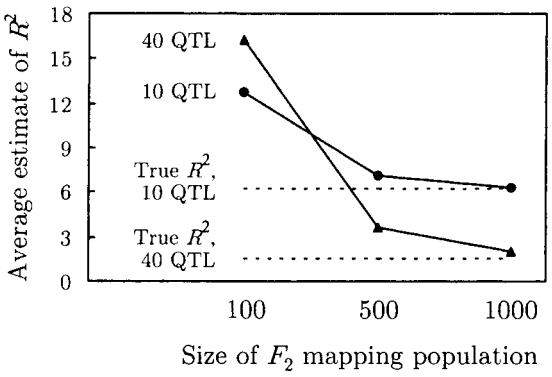


FIGURE 14.2. Upwards bias in R^2 values, when h^2 is 0.63, for individual QTL with different sizes of an F_2 mapping population (data from Beavis, 1994)

   3. Recommendation: evaluate in a minimum of 1000 progeny to minimize sampling error.
      a. Would this cause other possible error?
      b. If so, what would that be?

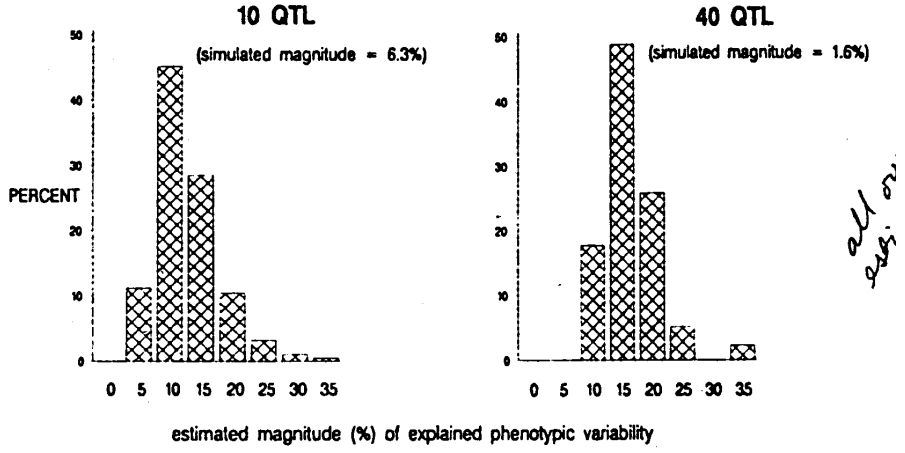


Figure 1. Frequency distribution of the estimated amount of phenotypic variability explained by correctly identified simulated QTL. Each simulated QTL contributed either 6.3 (for 10 QTL) or 1.6 (for 40 QTL) percent of the phenotypic variability in 100 F2 progeny that exhibited a heritability of 63%. Each frequency distribution was obtained from interval mapping of 200 simulated populations.

VI. QTL x environment interaction
   a. Paterson et al. (1991) found 29 QTL in tomato
      i. 4 present in all three environments
      ii. 10 in two
      iii. 15 in one
   b. Lee (1996) soybean QTL consistency depended on the trait
      i. Plant height 2/11 were consistently detected across environments
      ii. Maturity, 4/5 were identified across environments
   c. QTL x environment interaction is function of
      i. Crop
      ii. Trait
      iii. Environment

VII. Which QTL will be consistently identified?
   a. Those with the largest effects because they stand out against background error
   b. Paradox: these are also the same QTL that are the easiest to phenotypically select

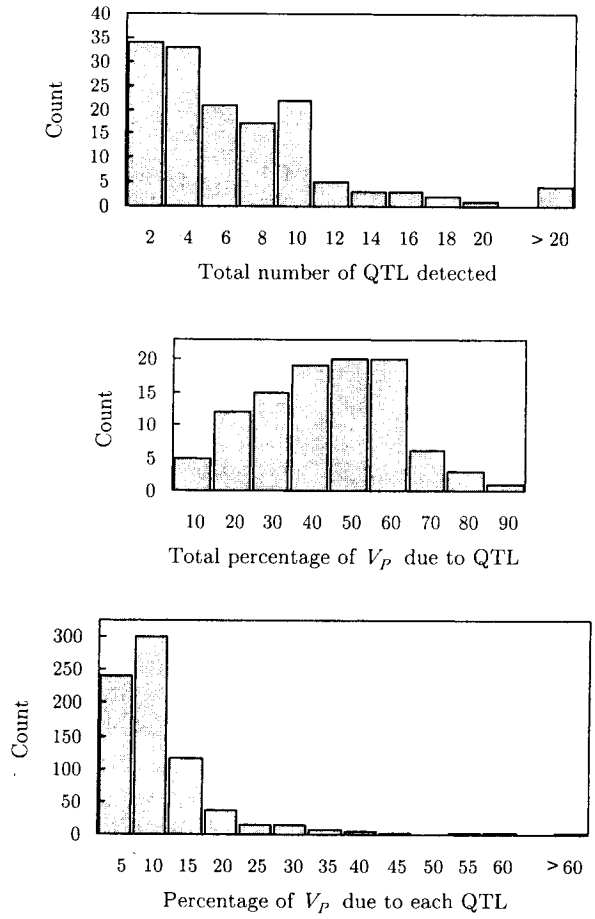


FIGURE 14.3. **Top graph:** Number of QTL detected for a trait in mapping studies with 250 or more progenies; **Middle graph:** Total percentage of V_P explained by all detected QTL; **Bottom graph:** Percentage of V_P explained by each detected QTL.

VIII. Empirical Results from QTL Mapping

a. Lots of QTL mapping studies (>250 entries, saturated map)
b. Most studies detect < 10 QTL: so is that all there really are?
c. The percent variation explained by a QTL is commonly overestimated (see previous and the lower graph.
d. Difficult to detect QTL with small effects; QTL with large effects usually occur in wider crosses and are easily fixed in breeding populations
e. Openshaw and Frascaroli (1998) evaluated 1000 progeny. 10 environments and found a total of 36 QTL

IX. Marker Selection

a. Marker based selection – selection based on solely on QTL from marker trait associations. This approach has to assume that you've identified the pertinent QTL influencing a trait

Table 4—QTLs identified for Yld, Mst, NSI, NRI, and Pht, base[illegible] 976 progeny.

	Yld (bu/ac)	Mst (%)	NRI (%Not)	NSI (%Not)	Pht (in)
No. QTLs	28	32	20	16	36
No. QTLs from P2(+)	14	13	13	9	14
No. QTLs from P1(-)	14	19	7	7	22
Sum of + QTL loci	17.2	3.5	28.2	3.5	11.7
Sum of - QTL loci	21.9	4.3	15.9	2.3	14.7
Min QTL locus	0.6	0.1	1.0	0.2	0.3
Max QTL locus	2.8	0.9	4.5	0.7	1.6
%M[a]	54	55	62	80	58
No. Locs	19	19	8	7	16
%V[b]	63	94	39	20	89
%R^{2c}	34	52	24	16	52

[a] %M is the % of genetic variance accounted for by the QTL model.
[b] %V is the % of phenotypic variance attributed to genetic effects.
[c] %R^2 is the % of phenotypic variance accounted for by the QTL model.

Table 5—Summary QTL x QTL interaction effects identified for Yld, Mst, NSI, NRI, and PHt.

		Yld	Mst	NRI	NSI	PHt
No. main effects		28	32	20	16	36
Main effects	%R^2	34	52	24	16	52
	%M	54	55	62	80	58
No. QTLxQTL interactions		7	13	8	0	15
Main + QTLxQTL effects	%R^2	37	55	28	-	56
	%M	59	59	72	-	63

b. Marker assisted selection – selection based on both QTL associations and phenotypic data. Assumes that you have NOT identified all the QTL for a particular trait; hence phenotypic data is used to complement marker work.
c. Relative Efficiency of MBS is an extension of indirect selection
    i. Marker score is the secondary trait and effects are associated therewith
    ii. H2 of the marker is assumed to be 1 less scoring errors
    iii. Vm is the variance of Va that is explained by the marker loci.
    iv. The genetic correlation

$$ra = \frac{Vm}{\sqrt{VaVm}} = \sqrt{\frac{Vm}{Va}}$$

    v. To obtain relative efficiency of MBS to PS, substitute √Vm/Va for ra assume h2x = 1.

$$RE_{MBS:PS} = \frac{\sqrt{V_m/V_a}}{h}$$

h = square root of heritability of the trait (not the marker)

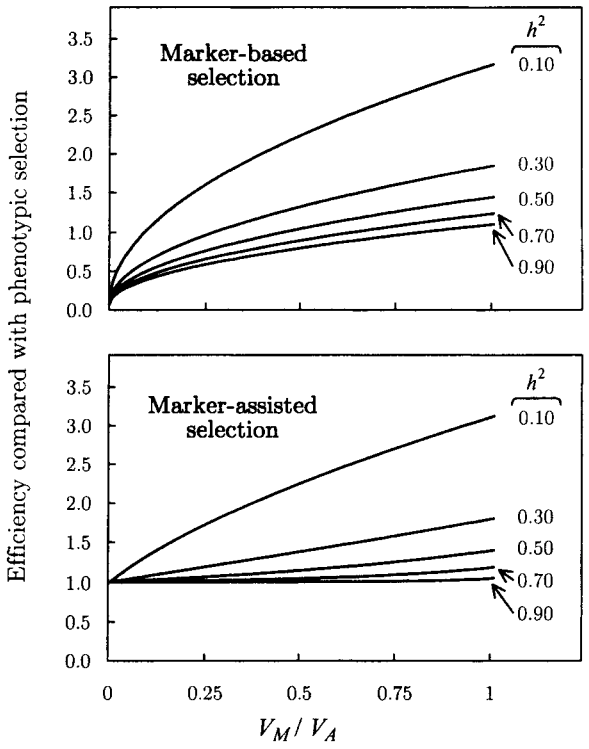


FIGURE 14.4. Relative efficiencies of marker-based selection and marker-assisted selection compared with phenotypic selection.

vi. MBS is most effective
    a. when heritability of the trait is low
    b. Vm accounts for a large proportion of the Va.
    c. Vm is likely to be high only when h2 is high so MBS will only be effective when QTL effects are estimated when h2 is high and selection is completed when h2 is low.

d. Relative efficiency of MAS is provided by the Smith Hazel Selection Index (imagine that)

$$I = b_Y y + b_M m$$

Where b_Y is the weight give to the phenotypic value;

y is the phenotypic value for the trait;

b_M is the weight given to the marker score;

m is the marker score;

$$\mathbf{b} = \mathbf{P^{-1}Ga}$$
$$= \begin{bmatrix} V_P & V_M \\ V_M & V_M \end{bmatrix}^{-1} \begin{bmatrix} V_A & V_M \\ V_M & V_M \end{bmatrix} \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

P – the phenotypic variance and covariance matrix

G – the genotypic variance and covariance matrix

a – vector of economic weight, marker weight is 0 as they have no intrinsic value.

$$b_Y = \frac{V_A - V_M}{V_P - V_M}$$

$$b_M = \frac{V_P - V_A}{V_P - V_M}$$

$$RE_{MAS:PS} = \sqrt{\frac{V_M/V_A}{h^2} + \frac{(1 - V_M/V_A)^2}{1 - h^2(V_M/V_A)}}$$

e. Like MBS, MAS is most efficient when
   i. H2 is low and
   ii. Vm/Va is high

f. MAS is never less efficient than PS, as it is part of it.

g. MAS primary value may be in efficiency; reducing the number of progeny needed for advancement.

X. Largest QTL MAS study 1000 progeny, testcrossed, 15+ environments. Saw potential benefits but the value was dependent on the trait and the situation. The real value of MAS may be in efficiency of time, resources or labor.

XI. Additional epistatic interaction analysis might help – analysis is now ongoing

TABLE 14.2. Relative efficiencies of marker-based selection and marker-assisted selection compared with phenotypic selection in maize.

Trait	V_M/V_A [a]	h^2	Efficiency over phenotypic selection: Marker-based selection	Marker-assisted selection
Yield	0.54	0.63	0.93	1.09
Grain moisture	0.55	0.94	0.76	1.00
Stalk lodging	0.80	0.20	2.00	2.01
Root lodging	0.62	0.39	1.26	1.33
Plant height	0.58	0.89	0.81	1.01

[a] V_M/V_A and h^2 values from Openshaw and Frascaroli (1997)

From: Bill Rooney
To: "George L Hodnett"
Subject: RE: turkeys and crosses
Date: Wednesday, November 04, 2009 2:03:00 PM

You're going to have to get those infected panicles out. You can prevent the disease with a treatment of Tilt fungicide, but if it already has disease, there is not much you can do about it.

We'll have turkeys, just let me know what you want.

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: "Anna Nguyen"
Subject: RE: Permission for publication
Date: Wednesday, November 04, 2009 1:26:00 PM

Anna:

Thanks for letting me see which material you were interested in using. Please use as you've described and I hope it is of use to you and your efforts.

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: Anna Nguyen [redacted]
Sent: Wednesday, November 04, 2009 1:17 PM
To: Bill Rooney
Subject: Re: Permission for publication

Dear Dr. Rooney;

Most certainly. I have attached the PDF file. Please let me know if you have trouble opening it.

Sincerely,
Anna Nguyen

----- Original Message -----
From: "Bill Rooney" <wlr@tamu.edu>
To: "Anna Nguyen" [redacted]
Sent: Saturday, October 31, 2009 6:13:21 AM GMT -06:00 US/Canada Central
Subject: RE: Permission for publication

Anna:

Can you provide me with a copy of the material that I developed that you plan to distribute? I'm not exactly sure which publication it is and I would like to review it to make sure that it is current and accurate.

Regards,

Bill

-----Original Message-----
From: Anna Nguyen [redacted]
Sent: Friday, October 30, 2009 3:04 PM
To: wlr@tamu.edu
Subject: Permission for publication

Dear Dr. William L. Rooney,

I would like to request permission to provide the publication of your article, "Annual Hybrid Energy Crops: Sorghums", to a group of energy professionals who participated in the training program called Energy Training for Agriculture Professionals www.entap.org. The ENTAP program is an education program designed to give USDA extension agents the tools to work with their clients on farm-scale energy technologies and issues. All use of your materials will be cited as belonging to you. Feel free to provide us with specific guidance on citing your materials.

If you have any questions feel free to get in touch with me at [redacted]

Thank you,

Anna Nguyen

From: Bill Rooney
To: [redacted]"
Subject: RE: Training program for Alvaro Eugenio de França
Date: Tuesday, November 03, 2009 5:59:00 PM

Geraldo:

To finish the paperwork for Alvaro's internship, if you could bring a copy of the following, I can get all the paperwork finished and back to him to get his Visa.

Specifically, I need:

Copy of Resume (in English if possible)
Proof of Health Insurance (copy of letter or card)
Copy of Passport

Thanks,
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: Geraldo Eugenio [redacted]
Sent: Wednesday, September 23, 2009 5:19 AM
To: wlr@tamu.edu
Cc: [redacted]
Subject: Training program for Alvaro Eugenio de França

Dr. Bill Rooney
Crops and Soils Science Department
Texas A&M University

Dear Bill,

I feel that now is time to proceed with Alvaro´s enrolment at your program in Texas A&M. As I informed previously, I intend that he will be between March and July, 2010, if it is convenient to you.
Please advise us for what we have to do. Remembering that He is an Agronomy student, at the UFRPE -
Agricultural University of the State of Pernambuco, where I got my bachelor degree. Álvaro is in his 9th semester.
Incredible, but Agronomy in this University, at the moment, is course of 11 semesters. So, most ot the
technical courses have been already taken.

Sincerly Yours.

Geraldo Eugenio

From:	Bill Rooney
To:	"Yüksel BÖLEK"
Subject:	RE: Seeds for research
Date:	Tuesday, November 03, 2009 5:56:00 PM

Thanks Yuksel.

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: Yüksel BÖLEK [mailto:yuksel@ksu.edu.tr]
Sent: Tuesday, November 03, 2009 8:01 AM
To: wlr@tamu.edu
Subject: Seeds for research

Dr. Rooney,
I was one of your student taking Plant Breeding course. I was working with Dr. Kamal El-Zik and Dr. Peggy Thanxton. I completed my PhD in 2002 and came back to Turkey.

First of all i would like to thank to you for providing seeds for our project. Actually project started by Dr. Aydin. Since he left to USA, I have to complete it. Initially, the parents we used had very different flowering times and i have got difficulty in crossing. With the material you are going to send we will have a chance to complete this project. In the agreement you send it, it is mentioning the development of RILs. Actually i have no time to develope RILs. For mapping purpose i am going to use F2s. So i need only parents and F1s to develope F2s for phenotyping. After completing mapping, i would like to add your name on the paper and publish it togather. The seeds will not be use after mapping and totaly destroyed.

As soon as i complete the signature i will send the agreement.

Thank you very much.

Dr. Yüksel BÖLEK
Kahramanmaras Sütçü Imam University
Faculty of Agriculture
Field Crops Dep.
KAHRAMANMARAS/TURKEY

--

From: Bill Rooney
To: "Slovacek, Jackie"
Subject: RE: Meeting/Lunch tomorrow
Date: Tuesday, November 03, 2009 5:20:00 PM

Ham or roast beef if you please. I don't need extra turkey….

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: Slovacek, Jackie [mailto:j-slovacek@tamu.edu]
Sent: Tuesday, November 03, 2009 4:01 PM
To: Bill Rooney; Mullet, John E.
Subject: Meeting/Lunch tomorrow

I will be ordering lunch from Blue Baker tomorrow for our 11:00 am meeting. Let me know if you have a preference, if not I will order the turkey sandwiches.

Jackie

Jackie Slovacek
Assistant to the Associate Director
Texas AgriLife Research
113 Jack K Williams Administration Bldg
College Station, Texas 77843-2142

979.845.7980
979.458.4765 Fax

From: Bill Rooney
To: "Bishop, Edna V"
Subject: RE: scheduling meeting
Date: Tuesday, November 03, 2009 5:19:00 PM

3:30 to 5:00 works better for me.

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: Bishop, Edna V [mailto:Ebishop@tamu.edu]
Sent: Tuesday, November 03, 2009 4:26 PM
To: Bill Rooney; Rooney, Lloyd
Cc: Norton, Roger
Subject: scheduling meeting
Importance: High

Dr. Bill Rooney and Dr. Loyd Rooney,

Dr. Geraldo Eugenio França will be visiting Texas A&M on November 23, 2009. He is a former student and currently the Executive Director of Embrapa, a governmental agency in Brazil.

I am scheduling some meetings for him and would like to schedule a meeting with you both to discuss collaborations between Embrapa and Texas A&M. Dr. Roger Norton will accompany Dr. França to this meeting.

Please, inform me of your availability for a one hour meeting on the following times on **Monday, November 23**:

between 9:00 – 12:00 noon

between 3:30 – 5:00 pm

Thank you so much,

Edna

--
Edna Bishop
International Programs Office

Texas A&M University

204 Coke | 4251 TAMU
College Station, TX 77843-4251 | USA
Tel. +1 979.845.1299 | Fax. +1 979.845.6228
Email ebishop@tamu.edu | Web http://olap.tamu.edu

Welcome to Aggieland

From: Bill Rooney
To: "Pedersen, Jeff"
Subject: RE: Sungrant
Date: Tuesday, November 03, 2009 5:18:00 PM

Yes, I'll be there for the SGC so we can talk after meeting.

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: Tuesday, November 03, 2009 5:05 PM
To: Bill Rooney
Cc: Mitchell, Rob
Subject: Sungrant

Bill:

Will you be at the ASTA meetings in Chicago, and if so could you spare some time to review what is going on in the Sungrant program with me? It appears that I am now part of the program.

Jeff

From: Bill Rooney
To: "Ken Davenport"
Subject: RE: Chromatin Visit
Date: Tuesday, November 03, 2009 1:37:00 PM

Ken:

I'll be occupied with U Illinois through Thursday evening, but Friday morning is allocated to visiting with Chromatin. I'll be available from 7 am through airport departure. Breakfast is fine, just let me know. As soon as I know accommodations, I'll let you know (U Illinois is making those arrangements).

What do you want in the seminar – like what you saw here at TAMU?

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: Ken Davenport [redacted]
Sent: Tuesday, November 03, 2009 1:06 PM
To: Bill Rooney
Cc: Daphne Preuss; Shawn Carlson; [redacted] rounsley@email.arizona.edu; Song Luo; Jeff Scheib; Greg Zinkl; Brad Schwartz
Subject: RE: Chromatin Visit

Bill,

Thanks much for this information. Let's plan on beginning at 9:00 a.m. at the Enterprise Works Building 60 Enterprise Drive. This location is the Research Park at the University of Illinois where we are based in Champaine. We will be either driving down Thursday evening (12th) or that Friday morning (13th). Would you be available for breakfast that Friday morning? If so, some of us would arrange to have breakfast with you if you wish.

I have copied Shawn Carlson who leads the science team in Champaign and will serve as the host for the meeting. We would begin with a seminar presentation by you, followed by a brief tour of our facilities and discussion. We will arrange for your transportation to the airport. In all probability, Larry, Steve and I will take the same flight from CMI since we will be heading on to our respective destinations.

We look forward to meeting with you next Friday.

Best regards,

Ken

Kenneth G. Davenport, Ph. D.
Strategic Development
Chromatin Inc.
3440 S. Dearborn St., Suite 280
Chicago, IL 60616

+1.312.235.3619 (O)
+1.312.235.3611 (F)
+1.214.215.2984 (M)

From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Tue 11/3/2009 12:53 PM
To: Ken Davenport
Subject: RE: Chromatin Visit

Ken

I'm scheduled to depart Champaign at 12:40 pm on AA4052

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: Ken Davenport [redacted]
Sent: Monday, November 02, 2009 8:10 PM
To: wlr@tamu.edu
Subject: Chromatin Visit

Bill, we are beginning to make arrangements for your visit next Friday, 13 November. Because I am arranging for Larry Lambright to fly in from Lubbock and our folks to drive down from Chicago, knowing your departure time that Friday would facilitate planning. Steve Rounsley (U AZ) bioinformaticist will be with us in Chicago and drive down with us for your seminar. Please advise at your earliest opportunity or feel free to give me a call (214,.215.2984) tomorrow if you wish. . Thanks, Ken

From: Bill Rooney
To: "DoKyoung Lee"
Subject: RE: invited seminar
Date: Tuesday, November 03, 2009 1:31:00 PM

DK:

I'm scheduled to arrive Wednesday evening at 8:50pm on AA3418. I've allocated all of Thursday to spend on campus. I'm open to visit with anybody you see fit during the day.

On Friday morning, I've been asked to meet with Chromatin, a company based in Chicago who will come down to Champaign for the morning. Bottom line, you don't have to worry about me on Friday.

Once you get a schedule together for Thursday, just let me know. Also, what topics do you want coverage of? Anything specific?

I'll cover my plane ticket. If you can cover the hotel, that'll be fine with me. I don't really care which hotel – just let me know.

Regards,

Bill

11NOV - WEDNESDAY
LV COLLEGE STATION 3:55 PM 3387 American Airlines
AR DALLAS FT WORTH 4:50 PM ECONOMY
OPERATED BY AMERICAN EAGLE Food For Purchase
WILLIAM ROONEY SEAT 10A FREQUENT FLYER:75YJ910

11NOV - WEDNESDAY
LV DALLAS FT WORTH 6:50 PM 3418 American Airlines
AR CHAMPAIGN 8:50 PM ECONOMY
OPERATED BY AMERICAN EAGLE Food For Purchase
WILLIAM ROONEY SEAT 11C FREQUENT FLYER:75YJ910

13NOV - FRIDAY
LV CHAMPAIGN 12:40 PM 4052 American Airlines
AR CHICAGO OHARE 1:35 PM ECONOMY
OPERATED BY AMERICAN EAGLE Food For Purchase
WILLIAM ROONEY SEAT 16C FREQUENT FLYER:75YJ910

13NOV - FRIDAY
LV CHICAGO OHARE 3:25 PM 2335 American Airlines
AR DALLAS FT WORTH 5:50 PM ECONOMY
Food For Purchase
WILLIAM ROONEY SEAT 30E FREQUENT FLYER:75YJ910

13NOV - FRIDAY
LV DALLAS FT WORTH 8:35 PM 3498 American Airlines
AR COLLEGE STATION 9:25 PM ECONOMY
OPERATED BY AMERICAN EAGLE Food For Purchase
WILLIAM ROONEY SEAT 14C FREQUENT FLYER:75YJ910

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: DoKyoung Lee [mailto:leedk@illinois.edu]
Sent: Thursday, October 29, 2009 1:59 PM
To: 'Bill Rooney'
Subject: invited seminar

Dear Bill,

I hope you remember the seminar for our department scheduled on November 12.
If you arrange your travel we will reimburse later. I will arrange a hotel if you don't have any preference. Also It will be nice to have your title sometime next week.
I am wondering if you go to ASA meeting. I will be there.
Thanks,

D.K.

DoKyoung "D.K." Lee
Assistant Professor of Biomass and Bioenergy Crop Production
Department of Crop Sciences, University of Illinois
S-320 Turner Hall, MC-046
1102 South Goodwin Avenue
Urbana, Illinois 61801

From: Bill Rooney
To: "Pam Wilhelm"
Subject: RE: RE: Ceres account info
Date: Tuesday, November 03, 2009 1:22:00 PM

Pam:

I believe (but I'm not 100% sure) that Ceres wants to see division on how the funds are spent between breeding activities, molecular genetic activities and agronomic activities.

For my project, essentially all of the activity is breeding. What I don't know is if that should be broken into additional categories (labor, travel supplies, etc.) - maybe you or Michele does.

Hope that helps.

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: Tuesday, November 03, 2009 1:10 PM
To: Bill L Rooney
Subject: Fwd: RE: Ceres account info

Dr. Rooney, would you please see the message below and see if you know what they want and how to get it to them? I'm not sure I can give them the answer to the questions they have since I really do not know what they are talking about.

>>> "Nelson, Michelle" <m_nelson@tamu.edu> 11/3/2009 11:30 AM >>>
I believe it is: 405235.

-----Original Message-----
From: Pam Wilhelm [mailto:PWilhelm@ag.tamu.edu]
Sent: Tuesday, November 03, 2009 11:27 AM
To: Atin Agrawal; Nelson, Michelle
Subject: Re: Ceres account info

I need to know what account number/s this involves to know where to begin.

>>> "Nelson, Michelle" <m_nelson@tamu.edu> 11/3/2009 11:03 AM >>>
Hello All:

Instead of calling everyone I thought this might be the best way to go about getting the conference call information out. I'd like to apologize for any confusion or mishaps with the conference call yesterday. It sounds like the line went down or something. Anyway, I was able to speak with Atin Agrawal and Connie Curren in Financial and

go over a little on what is needed to meet Ceres requests, which is to see expenses by focus area.

Connie and Atin will set up the new account; I believe there are 3 objectives: 1. Breeding and Characteristics, 2. All of BioBio activities, and 3. Yeung's Activities. What Financial needs is for Soil and Crop and BioBio to begin tracking all their info now so that corrections can be made and directed into the correct accounts. They need to know what PI is handling what areas and need to know budgets for each area. They also need to know what the remaining budget was at the end of June and work to present for each focus area. Please begin compiling your information and getting numbers into Financial so they can begin setting up the accounts.

If that is as clear as mud please contact Atin and Connie. As I'm just starting on this myself I am still learning as well. Atin's contact information is AAgrawal@ag.tamu.edu; 845-7864 and Connie's is c-curin@tamu.edu; 845-0519. They said they will be more than happy to go over any questions you may have.

Please contact me as well if you have any questions.

Thank you,

Michelle Nelson

Program Associate

100I Centeq Bldg. A

College Station, Texas 77843

MS 2583

979-458-2671 Office

979-219-1318 Cell

From: Bill Rooney
To: "Ioan Negulescu"
Subject: RE: 2010 USDA SBIR Panel
Date: Tuesday, November 03, 2009 12:35:00 PM

Ioan:

I've got another meeting that has been scheduled for the same time. Thus, I can't participate.

Thanks for the offer, perhaps another time.

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: Ioan Negulescu [redacted]
Sent: Monday, November 02, 2009 10:14 AM
To: Bill Rooney
Subject: Re: 2010 USDA SBIR Panel

Bill: Here are the answers:
1. It depends on the individual proposal. Narrative text around 20-25 pages. Support documents (forms, CV of authors, history of support, support letters) may add up to 20-40 pages.

2. From my experience: To write a review (for 6 proposals as a primary reviewer) I need usually around 1 hour for each. To read and make some notes for discussion as a secondary reviewer (5-6 proposals) I need usually 30-40 minutes per proposal. About 30 minutes to read a proposal for which I've been assigned as a reader (5-6 proposals, to intervene as necessary during the discussion of the proposal). You will be provided with a laptop so that you will have access to all proposals and reviews (yours and that of ad-hoc reviewers, usually 2-4 reviews). Roughly speaking, some 12-14 hours of intense work. But this is from my experience, you might be a faster reviewer!

6. Last year the honorarium was $225/day.

I hope that you will join the 2010 panel! Best regards, Ioan

From: Bill Rooney <wlr@tamu.edu>
To: Ioan Negulescu [redacted]
Sent: Mon, November 2, 2009 8:55:07 AM
Subject: RE: 2010 USDA SBIR Panel

Ioan:

Can you provide me with an estimate of

1. Length of these proposals
2. Estimated time for review of each proposal
3. Estimated allowance for the process.

I'll let you know once I have an idea of the amount of time required prior to the actual review.

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: Ioan Negulescu [redacted]
Sent: Saturday, October 31, 2009 12:43 PM
To: wlr@tamu.edu
Subject: 2010 USDA SBIR Panel

Dear Professor Rooney:
You are recognized as an expert in the field of genetics and plant breeding. Therefore I am inviting you to become a member of the 2010 USDA panel for reviewing proposals related to this topic (6 as a primary reviewer for which you will write a review, 6 as a secondary reviewer and 6 as a reader which you will discuss only in the panel) submitted to Small Business Innovative Research (SBIR). The panel will meet in Washington on 12-15 January, 2010. All expenses and a generous allowance will be supported by USDA. Please respond to this message at your earliest convenience.
Best regards, Ioan

Ioan I. Negulescu, PhD
USDA SBIR 2010 Panel Manager
Distinguished LSU AgCenter Grace Drews Lehmann Professor, Louisiana State University, Baton Rouge, LA 70803, (225) 802-2306, inegule@lsu.edu

From: Bill Rooney
To: "Sharon Mitchell"
Subject: RE: Hybrid cross increases in Puerto Rico
Date: Tuesday, November 03, 2009 11:57:00 AM

Sharon:

I checked our inventory and we must have sent you the remaining seed we had of that single cross female. So, we don't have any, but I'm glad to hear that it performed well. Sorry I can't provide you with anymore of this year.

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: Sharon Mitchell [mailto:sem30@cornell.edu]
Sent: Monday, November 02, 2009 3:30 PM
To: Bill Rooney
Cc: Stephen Kresovich
Subject: Hybrid cross increases in Puerto Rico

Hi Bill,
We've finished evaluating our hybrid crosses for biomass production in NY state and are ready to go to larger field trials. We got funding from the NY state to grow a few hybrids in farmer's fields across the state next year. At any rate, the hybrids that we made with your female line, A.Tx642/BTx2752, performed well in small plots this year. Jim Osborne tells me that this hybrid A-line came from you and that we'd need to perform crosses to resynthesize these lines for our crosses. By any chance, would you be willing to provide seed from the above A- line for our two crosses this winter? We'd quite a bit of seed from your A-line (~12K.. don't know how this converts to seed weight) to make around 200lbs of hybrid seed from each of two male lines. If you can't do this it's all right. We'll use one of Jim's A lines even though they don't perform quite as well for us.

Steve K asked me to give you his regards. He's doing well in SC and will be in contact soon.

Hope you are doing well,
Sharon

Sharon E. Mitchell, Ph.D.
Manager, Institute for Genomic Diversity Laboratories
Biotechnology Building, Room 151
Cornell University
Ithaca, NY 14853-2703
sem30@cornell.edu
Ph: (607) 254-4851

FAX: (607) 254-6379

From: Bill Rooney
To: "Ken Davenport"
Subject: RE: Chromatin Visit
Date: Tuesday, November 03, 2009 11:53:00 AM

Ken

I'm scheduled to depart Champaign at 12:40 pm on AA4052

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: Ken Davenport [redacted]
Sent: Monday, November 02, 2009 8:10 PM
To: wlr@tamu.edu
Subject: Chromatin Visit

Bill, we are beginning to make arrangements for your visit next Friday, 13 November. Because I am arranging for Larry Lambright to fly in from Lubbock and our folks to drive down from Chicago, knowing your departure time that Friday would facilitate planning. Steve Rounsley (U AZ) bioinformaticist will be with us in Chicago and drive down with us for your seminar. Please advise at your earliest opportunity or feel free to give me a call (214,.215.2984) tomorrow if you wish. . Thanks, Ken

From: Bill Rooney
To: "James Osborne"
Subject: RE: question on timing
Date: Tuesday, November 03, 2009 11:48:00 AM

Jim:

We should be ready to send by November 10th.

Thanks for working with us.

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: James Osborne [redacted]
Sent: Tuesday, November 03, 2009 9:46 AM
To: Dr. Bill Rooney
Cc: [redacted]
Subject: RE: question on timing

Bill,
No problem, I will work around it, I can't work with all of it at once and we can't plant it all at once! Send it as soon as you can, however, make sure you include everything you need to or there is no need to send it at all. I could receive it on the 20th. or 21st. and still have it in Puerto Rico in plenty of time.
I thank you for the update,
Jim

From: wlr@tamu.edu
To [redacted]
CC: delroy@tamu.edu
Subject: question on timing
Date: Tue, 3 Nov 2009 06:46:16 -0600

Jim:

What is the latest date I can get you the seed for PR?

I've got a student who didn't realize we have to get seed for some PIs from Griffin and we'd like to request that. I expect we'll have the seed by next Monday and could have it to you sometime late next week. Will that work? If not, what is the latest date?

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: "Chalkley, Lee Ann"
Subject: RE: Sorghum Request
Date: Tuesday, November 03, 2009 11:47:00 AM

Thanks so much!

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: Chalkley, Lee Ann [mailto:LeeAnn.Chalkley@ars.usda.gov]
Sent: Tuesday, November 03, 2009 9:48 AM
To: Bill Rooney
Cc: Delroy Collins; [redacted] Fields, Tiffany; Pederson, Gary
Subject: RE: Sorghum Request

Dr. Rooney,

Dr. Pederson is out-of-the-office; however, I have copied Tiffany so that she can start processing your request. We should be able to get the seed pulled and shipped to you by Monday. Also, Tiffany will email you the tracking number when the samples are actually shipped.

If you have questions, please let me know.

Thanks,
Lee Ann

Seed Storage Manager
USDA, ARS, PGRCU
1109 Experiment Street
Griffin, GA 30223
email: leeann.chalkley@ars.usda.gov
Phone: (770) 229-3334
Fax: 770-229-3324

From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Tuesday, November 03, 2009 9:31 AM
To: Pederson, Gary; Chalkley, Lee Ann
Cc: 'Delroy Collins'; [redacted]
Subject:

Gary and Lee Ann

First, I have to apologize for this late request, but I was traveling and I had a student who didn't realize that we had to request this seed. We would like seed of the following lines so that we can plant them in our winter nursery. We've got to have the seed ready by early next week. So, the question for you – can you pull it and send it to us by Monday/Tuesday of next week? If so,

multiple thanks, and I owe you one. If not, just let me know and we'll plan accordingly

Again, my apologies for the extremely short notice.

Regards,

Bill

Specific requests:

PI 154866
PI 156906
PI 276820
PI 297223
PI 329456
PI 329470
PI 329595
PI 482735
PI 482826
PI 482831
PI 482837
PI 482901
PI 494910
PI 494912
PI 495929
PI 496129
PI 496171
PI 501024
PI 501075
PI 513398
PI 513411
PI 513438
PI 513467
PI 513821
PI 514514
PI 514543
PI 514564
PI 521108
PI 521191
PI 521195
PI 521198
PI 521202
PI 521295
PI 521892
PI 521904
PI 521905

PI 521906
PI 521924
PI 521988
PI 521999
PI 522028
PI 524552
PI 524588
PI 524599
PI 524715
PI 526068
PI 526069
PI 526136
PI 532226
PI 536553
PI 536562
PI 536571
PI 536592
PI 536606
PI 537751
PI 537752
PI 537763
PI 545575
PI 545579
PI 549173
PI 549175
PI 549198
PI 562085
PI 562159
PI 562732
PI 563179
PI 568684
PI 568691
PI 568695
PI 568698
PI 568699
PI 568700
PI 568701
PI 568730
PI 568758
PI 573258
PI 573267
PI 586036

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:	"Amir M Ibrahim"; "David Baltensperger"; "Steve Hague"; "cwsmith@tamu.edu"; "Russell Sutton"
Cc:	"sethmurray@neo.tamu.edu"; "Carol Rhodes"; "Glenda Kurten"; "Judy Young"
Subject:	RE: Agronomix Software Renewal
Date:	Tuesday, November 03, 2009 11:45:00 AM

Amir and David:

We've moved away from using Agrobase and if someone needs a one of our copies they are welcome to use it.

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: Amir M Ibrahim [mailto:AIbrahim@ag.tamu.edu]
Sent: Tuesday, November 03, 2009 10:56 AM
To: David Baltensperger; Steve Hague; cwsmith@tamu.edu; Russell Sutton; wlr@tamu.edu
Cc: sethmurray@neo.tamu.edu; Carol Rhodes; Glenda Kurten; Judy Young
Subject: Agronomix Software Renewal

Dear Dr. Baltensperger,

It is time to renew the Agrobase Gen II licence. We have licences for Ibrahim (2), B. Rooney (2), Hague/Smith (1), the students' lab (1). Russell Sutton has been being paying for his licence (under Bhoja Raj's name who is doing research in the Commerce area). I am not sure whether or not Seth needs a student licence.

We pay for one main licence. The others are student licenses that cost $200 each.

All of these licences need to be renewed this month to prevent interrupted use of the database. The total cost is CAD $1668.10. I am always available to provide a one-day training workshop per semester. Also, each licence comes with great, full technical support. Thanks a lot.

Best regards,
Amir

Amir Ibrahim, Ph.D.
Associate Professor,
Small Grains Breeder/Geneticist
Dep. of Soil and Crop Sciences
College of Agriculture and Life Sciences
Texas A&M University
2474 TAMU
College Station, Texas 77843-2474

Work: (979) 845-8274
Fax: (979) 845-0456

>>> "Agronomix Software - Service & Sales" <[redacted]
11/3/2009 9:50 AM >>>
Amir,

The names I have are as follows:

Kerry Mayfield
Dusten Borden
Jenny Bailey
Mohamed Ali
Student Lab
Bhoja Raj Basnet

Kind regards,
Chris Leonard
Service and Sales Associate

AGRONOMIX SOFTWARE, INC.
171 Waterloo Street
Winnipeg, Manitoba R3N 0S4
W direct 204.487.4245 | fax 204.487.4250
e-mail [redacted]
(web www.agronomix.com

This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify Agronomix Software, Inc immediately. Thank-you.

-----Original Message-----
From: Amir M Ibrahim [mailto:AIbrahim@ag.tamu.edu]
Sent: November-03-09 9:55 AM
To: Agronomix Software - Service & Sales
Subject: Re: Agronomix Software Inc. - Generation II Annual Renewal Followup

Can you send me the names of the students on this account? Thanks.

Amir Ibrahim, Ph.D.
Associate Professor,
Small Grains Breeder/Geneticist
Dep. of Soil and Crop Sciences
College of Agriculture and Life Sciences
Texas A&M University
2474 TAMU
College Station, Texas 77843-2474
Work: (979) 845-8274
Fax: (979) 845-0456

>>> "Agronomix Software - Service & Sales" <[redacted]>
11/2/2009 10:28 AM >>>
Dear Amir,

Re: 0212GEN-01

This is a friendly reminder to inform you that we have not yet received payment for Invoice 090800016, dated August 31, 2009. The invoice total is CAD $1668.10 for the renewal of your AGROBASE Generation II software license. We would greatly appreciate notification of the status regarding this annual renewal.

For your convenience, I have attached an electronic copy of the invoice for your review. If the payment has already been processed, it would be most helpful if you could provide payment details for us to track from our end.

Thank you for your continued support. I look forward to your reply.

Have a great day!

Sincerely,

Chris Leonard

Service and Sales Associate

AGRONOMIX SOFTWARE, INC.

171 Waterloo Street

Winnipeg, Manitoba R3N 0S4

(direct 204.487.4245 | 7 fax 204.487.4250

* e-mail [redacted]

web <http://www.agronomix.com/> www.agronomix.com

From: Bill Rooney
To: "Kimberly Christiansen"
Subject: RE: REMINDER - INTSORMIL Annual Reports
Date: Tuesday, November 03, 2009 11:39:00 AM

I'll have it to you on Monday Nov 9…….

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, November 03, 2009 8:42 AM
To: gejeta@purdue.edu; hamakerb@purdue.edu; David S Jackson; vara@ksu.edu; wlr@tamu.edu; lrooney@tamu.edu; sstaggen@ksu.edu; Jeff.Wilson@ars.usda.gov; Charles S Wortmann; jhancock@ksu.edu
Subject: REMINDER - INTSORMIL Annual Reports

This is a reminder that the deadline for submission for your annual report was Nov. 2. If you are expecting a significant delay in your submission (1 week or more) please let me know as soon as possible. Thanks.

Kim

From: Bill Rooney
To: "Gary Pederson"; "LeeAnn.Chalkley@ars.usda.gov"
Cc: "Delroy Collins"; [redacted]
Date: Tuesday, November 03, 2009 8:30:00 AM

Gary and Lee Ann

First, I have to apologize for this late request, but I was traveling and I had a student who didn't realize that we had to request this seed. We would like seed of the following lines so that we can plant them in our winter nursery. We've got to have the seed ready by early next week. So, the question for you – can you pull it and send it to us by Monday/Tuesday of next week? If so, multiple thanks, and I owe you one. If not, just let me know and we'll plan accordingly

Again, my apologies for the extremely short notice.

Regards,

Bill

Specific requests:

PI 154866
PI 156906
PI 276820
PI 297223
PI 329456
PI 329470
PI 329595
PI 482735
PI 482826
PI 482831
PI 482837
PI 482901
PI 494910
PI 494912
PI 495929
PI 496129
PI 496171
PI 501024
PI 501075
PI 513398
PI 513411
PI 513438
PI 513467
PI 513821
PI 514514
PI 514543

PI 514564
PI 521108
PI 521191
PI 521195
PI 521198
PI 521202
PI 521295
PI 521892
PI 521904
PI 521905
PI 521906
PI 521924
PI 521988
PI 521999
PI 522028
PI 524552
PI 524588
PI 524599
PI 524715
PI 526068
PI 526069
PI 526136
PI 532226
PI 536553
PI 536562
PI 536571
PI 536592
PI 536606
PI 537751
PI 537752
PI 537763
PI 545575
PI 545579
PI 549173
PI 549175
PI 549198
PI 562085
PI 562159
PI 562732
PI 563179
PI 568684
PI 568691
PI 568695
PI 568698
PI 568699

PI 568700
PI 568701
PI 568730
PI 568758
PI 573258
PI 573267
PI 586036

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: "James Osborne"
Cc: "Delroy Collins"
Subject: question on timing
Date: Tuesday, November 03, 2009 6:46:00 AM

Jim:

What is the latest date I can get you the seed for PR?

I've got a student who didn't realize we have to get seed for some PIs from Griffin and we'd like to request that. I expect we'll have the seed by next Monday and could have it to you sometime late next week. Will that work? If not, what is the latest date?

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: "Lea Dell Morris"
Subject: flight reservation on AA
Date: Tuesday, November 03, 2009 6:34:00 AM

Lea Dell:

I need to book the following flights. Could you do that for me?

American Airlines

Departure: 11/11/09
AA3387
AA3418

Return: 11/13/09
AA4052
AA2335
AA3498

Estimated Cost: $714

Please make the reservation under the name William L. Rooney and use my Advantage Number: 75YJ910

As you might expect, I need a travel and leave request for this travel

Destination: Champaign, Illinois
Purpose: Thursday, Meet with U of Illinois Bioenergy Center Faculty and present a seminar. Friday morning, meet with Chromatin, Inc regarding sorghum.

Estimated Costs: $800

Thanks!

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: "Miss Pamela Benton"
Subject: info needed
Date: Tuesday, November 03, 2009 6:18:00 AM

Pam:

I'm finally back and working on your official invitation for working with us next spring/summer.

I'm sure you've sent me this before, but I need three items before we can process and send your "official" invitation.

If you can send me a copy (pdf is best) of :

1. Copy of Resume
2. Evidence of Pre-arrival Health Insurance (a card, letter, etc.)
3. Copy of Passport (probably just the pertinent cover page)

Once I get that information, I'll be able to send you an official invitation as soon as next Monday.

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: "Krueger, Paul"
Subject: RE: Sorghum production and drying
Date: Monday, November 02, 2009 7:52:18 PM

Paul:

See answers below.

Regards,

Bill

From: Krueger, Paul [mailto:pkrueger@lyle.smu.edu]
Sent: Monday, November 02, 2009 6:56 PM
To: Bill Rooney
Cc: Tim Trop
Subject: Sorghum production and drying

Hi Bill,

I'm trying to firm up and document some of our numbers for the Maui ethanol project and I've got a few questions to run by you.

1) In your comments on Table 1-4 of the original report written by Thomas and Dave, you noted that a good sorghum hybrid should be able to produce 4 tons/acre of grain and 4 tons/acre of residue (with proper irrigation). Are these optimistic or conservative estimates? Can you point me to documentation that provides typical ranges we might expect? Does the 4 tons/acre of residue include the roots, or just the above ground collectable residue? (For the last question I'm trying to understand your comment about 4 tons/acre being available if we "collected it all".)

Those are solid average estimates, they can be higher or lower, depending on weather conditions and seasonal variation. They assume available moisture of 24-26" for the growing season. The ranges in Hawaii with irrigation should be minimal, from 6 -10 tons, primarily seasonal or cropping type (from seed vs. ratoon). The residue is collectable residue so it does not include the lower stalk and root system.

2) In terms of stover/residue collection, anything to avoid the stover touching the ground would probably be preferred in terms of boosting collection efficiency and reducing associated difficulties with collection. I've been able to determine at least two viable ways of doing this: (a) combine the grain only (leave the stalks in the field) and then make a second pass with a silage chopper that would cut and blow the residue into a following trailer for drying and baling later, and (b) combine the entire plant (stalk and grain) and then bail the residue directly as it comes out the back of the combine (an Australian

company called Glenvar (www.glenvar.com) has put together an aftermarket combination for doing the direct bailing). Option (b) (direct baling) on first glance seems like it would be simplest over all and probably involve the least labor. However, literature I've been able to find on corn stover baling suggests the stover needs to be dried to less than 30% moisture (preferably 20% moisture) to ensure temperature stability of the bales and avoid dry mater loss during storage. If I'm not mistaken, Tim said you mentioned the plant moisture content should be about 50% at harvest, which would make direct baling unwise without some further drying measures. Is there a way to further dry the material in the field prior to harvest so direct baling is feasible, or are we stuck with the 50% moisture content if we irrigate for high yield? Of course, if you have any alternative ideas on the stover collection issue, please let me know.

The plants can be killed by spraying salt or glyphosate herbicide over the top after maturity. Killing the plant will allow it to dry down a little better, but you have to manage it closely because dead plants are more prone to lodging (luckily wind storms are not a big danger on Maui, so this is less of a concern). I would think option b is best with reduced passage, but the question is how dry can you get it before harvest problems and at what cost? The cost refers to the fact that you have to leave the crop in the field longer and you will have to replant. That is not a big issue on the second harvest but it is a big issue on the first harvest of the year.

Best,

Paul K.

****
Paul S. Krueger, Ph.D.
Associate Professor
Department of Mechanical Engineering
Southern Methodist University
P.O. Box 750337
Dallas, TX 75275-0337

Office: (214) 768-1296
Fax: (214) 768-1473
e-mail: pkrueger@engr.smu.edu
web: http://engr.smu.edu/~pkrueger/
****

From: Bill Rooney
To: "Alves, Maria"
Cc: "Norton, Roger"; "lrooney@tamu.edu"
Subject: RE: Visit to Texas A&M University - Nov 20-23th 2009
Date: Monday, November 02, 2009 2:49:00 PM

Maria:

I would love it if you would schedule all of it! Below is what Geraldo sent me. If you could make these contacts and schedule the appointments, I would sure appreciated it. Unless I hear otherwise, I'll assume you can put the schedule together.

As for my schedule, I can meet with Geraldo on either Sunday or Monday (Saturday is out as I have to work the football game).

Regards,
Bill

Due to the commitments in Washington, on November 19 th and 20th, I will not be able to leave to College Station before Friday, Nov 20th, late afternoon or Saturday morning. I woulk like to ask your assistance and Dr. Rooney in order to organize, if possible, an agenda on Monday, Nov 23th, as following:
First I would like to be with you and Dr. Rooney.
If possible, let us make an appointment with the Dean of the College of Agriculture in order to discuss the enhancement on the cooperation between Embrapa and Texas A&M University.
I would like to have a moment to see Dr. Sam Feagley, and Dr. David Zuberer.
And, I will try to meet Mrs. Maria Alves, the head for the Brazilian Students Association, and Mrs. Vi Cook - Do not worry about this, Maria may take care of this appointment.
Then, later evening (19:20 h) I will fly back to Houston, and São Paulo.

Sincerely Yours.

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: Alves, Maria [mailto:malves@ipomail.tamu.edu]
Sent: Monday, November 02, 2009 2:46 PM
To: wlr@tamu.edu; lrooney@tamu.edu
Cc: Norton, Roger
Subject: RE: Visit to Texas A&M University - Nov 20-23th 2009

Dear Drs. Bill and Loyd Rooney,

My name is Maria Alves, I work at the Office for Latin American Programs here at Texas A&M University.

We have met before but I am not sure if you remember me.

I am contacting you to follow up on an email I got from Dr. Geraldo Eugenio.
I know he has been in touch with you in organizing his visit to Texas A&M, and I would like to offer my help in anything you need.
I will not be here on November 23. I suggested that he arrives on Friday night so I could meet with him on Saturday morning and organize a meeting with the Brazilian student on Saturday mid morning.
I know he also wants to meet with Dr. Hussey, Dr. Feagley and Mrs. Cook, have any of these meetings been scheduled? Would you like for me to take care of scheduling them?

I look forward to your reply
Thanks,
Maria

Maria Alves
Program Manager for South America, Office for Latin America Programs
Texas A&M University

204 Coke Building | 4251 TAMU
College Station, TX 77843-4251 | USA
Tel. +1 979.845.3367 | Fax. +1 979.845.6228
Email: malves@tamu.edu | Web http://olap.tamu.edu

Welcome to Aggieland

From: Geraldo Eugenio [redacted]
Sent: Saturday, October 31, 2009 6:56 PM
To: s-feagley@tamu.edu; Alves, Maria; wlr@tamu.edu; lrooney@tamu.edu
Cc: [redacted]
Subject: Visit to Texas A&M University - Nov 20-23th 2009

Dear Sam,

From Nov 19th to Nov 20th I will in Washington participating in the Bilateral Comission on Science and Technology, between the USA and Brazil. The Brazilian mission will be lead by the Ministry of Science and Tecnnology, Dr. Sérgio Rezende.
On Friday late evening or Saturday morning (November 21st) I am leavinto to College Station, where I will stay until Monday (November 23rd), evening.
I have asked Dr. Bill Rooney to help in organizing an agenda in our University, including a meeting with you. If you will be in the Campus in this date, please, be in touch with Dr. Bill Rooney or Dr. Lloyd Rooney.
I am algo in touch with Mrs. Maria Claudia Alves, the head for the Brazilian Student Association, and responsible in the International Student Department for the relationship between Texas A&M Unviversity and the Brazilian institutions.

Best Regards.

Geraldo Eugenio

Embrapa - Executive Director

From: Bill Rooney
To: "Simpson, Shay"
Subject: RE: Ceres meeting
Date: Monday, November 02, 2009 2:46:00 PM

That sounds fine to me. I'm going to pencil in at that time; please tell me if it is not going to work.
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: Simpson, Shay [mailto:shay-simpson@tamu.edu]
Sent: Monday, November 02, 2009 11:39 AM
To: Bill Rooney
Subject: RE: Ceres meeting

Not yet. But, here is what I am thinking. Since Ceres and we decided it should be in January (last January when we met that is what we decided), plus some people (Trish in particular) will already be in that area the week of Ag Prg Conference, we could go that week.

If we fly out on Wednesday (Jan 13), meet all day Thursday (Jan 14), meet partial morning (Jan 15), and fly back afternoon of 15th. Would you go those days? Bob said he would go then.

Shay

Shay L. Simpson
Associate Director, Corporate Relations
Texas AgriLife Research
Centeq Building 100D
979-845-6315 Office
979-571-3137 Mobile
shay-simpson@tamu.edu

From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Monday, November 02, 2009 11:25 AM
To: Simpson, Shay
Subject: Ceres meeting

Shay:

Any news on the scheduling of the Ceres meeting?

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: "Simpson, Shay"
Subject: Ceres meeting
Date: Monday, November 02, 2009 11:24:00 AM

Shay:

Any news on the scheduling of the Ceres meeting?

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: "Judy Young"
Cc: "George L Hodnett"
Subject: procard
Date: Monday, November 02, 2009 11:13:00 AM

Judy:

George Hodnett needs a ProCard for purchasing. To whom should he speak? Just let him 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

From: Bill Rooney
To: "sympa@groups.tamu.edu"
Subject: DISTRIBUTE cs-scsc642600-fall2009 fd48da92ba9fbc1d1d6ef137cdadb11a
Date: Monday, November 02, 2009 9:49:00 AM

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: "cs-scsc642600-fall2009@groups.tamu.edu"
Subject: class on Tuesday, Nov 3
Date: Monday, November 02, 2009 9:38:00 AM

Students:

The schedule indicates that we will not have class on Tuesday, November 3. However that is INCORRECT. WE WILL HAVE CLASS ON TUESDAY NOVEMBER 3.

I'll see you there.

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: "Rene Clara"
Subject: RE: Manager of costs
Date: Monday, November 02, 2009 9:24:00 AM

I approve. We can budget this in administrative costs. We can discuss it in December.

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: Rene Clara [redacted]
Sent: Sunday, November 01, 2009 9:36 AM
To: Bill Rooney
Subject: Manager of costs

Dear Dr. Bill,
For six months ago, Vilma project was financing to me a person in my office to take the costs of each project and informing to the leaders. This activity has been successful, but Vilma can not longer continue financing it, we pay to this person $ 1.00 the hour, $ 8.00 per day. The hiring does the CENTA with our funds, as the field workers. Now I must finance it with administration project that is the correct thing, but need your approval.
Regards,

René Clará V.
INTSORMIL
Host Regional Coordinator

CENTA, Apdo. Postal 885,
San Salvador, El Salvador, C.A.
Tel. (503) 2302 0239 - (503) 7815 2238 cel.
Fax: (503) 2302 0239

[redacted]

From: Bill Rooney
To: "Gary C Peterson"
Cc: "Pam Wilhelm"; "Carol Rhodes"
Subject: RE: INTSORMIL IDC
Date: Monday, November 02, 2009 8:58:00 AM

Gary (and accountants, I presume)…..

The appropriate account is which is an IDC Designated Account. (Carol and/or Pam can tell me if that is wrong…)

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: Gary C Peterson [mailto:g-peterson1@tamu.edu]
Sent: Thursday, October 22, 2009 10:39 AM
To: Bill L Rooney
Subject: INTSORMIL IDC

Bill,

The IDC for winter nursery and South Texas has been received. To what account do you want $3,500 transferred?

Thanks.

Gary

From: Bill Rooney
To: "Ioan Negulescu"
Subject: RE: 2010 USDA SBIR Panel
Date: Monday, November 02, 2009 8:37:00 AM

Ioan:

Can you provide me with an estimate of

1. Length of these proposals
2. Estimated time for review of each proposal
3. Estimated allowance for the process.

I'll let you know once I have an idea of the amount of time required prior to the actual review.

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: Ioan Negulescu [redacted]
Sent: Saturday, October 31, 2009 12:43 PM
To: wlr@tamu.edu
Subject: 2010 USDA SBIR Panel

Dear Professor Rooney:
You are recognized as an expert in the field of genetics and plant breeding. Therefore I am inviting you to become a member of the 2010 USDA panel for reviewing proposals related to this topic (6 as a primary reviewer for which you will write a review, 6 as a secondary reviewer and 6 as a reader which you will discuss only in the panel) submitted to Small Business Innovative Research (SBIR). The panel will meet in Washington on 12-15 January, 2010. All expenses and a generous allowance will be supported by USDA. Please respond to this message at your earliest convenience.
Best regards, Ioan

Ioan I. Negulescu, PhD
USDA SBIR 2010 Panel Manager
Distinguished LSU AgCenter Grace Drews Lehmann Professor, Louisiana State University, Baton Rouge, LA 70803, (225) 802-2306, inegule@lsu.edu

From: Bill Rooney
To: [redacted]
Subject: RE: Defense
Date: Sunday, November 01, 2009 7:03:33 PM

Good with me.
Bill

-----Original Message-----
From: [redacted]
Sent: Sunday, November 01, 2009 5:31 PM
To: Stephen R. King
Cc: Dirk Hays; Bill Rooney; Scott Finlayson
Subject: Re: Defense

Professors,

There is a time conflict with 10am. Would 2pm work instead?

Thursday, November 19, at 2pm.

Thanks for working with me on this.

Cheers,

Esten

----- Original Message -----
From: [redacted]
To: "Stephen R. King" <srking@tamu.edu>
Cc: "Dirk Hays" <dbhays@tamu.edu>, "Bill Rooney" <wlr@tamu.edu>, "Scott Finlayson" <sfinlayson@tamu.edu>
Sent: Friday, October 30, 2009 11:43:53 AM GMT -06:00 US/Canada Central
Subject: Re: Defense

Hello all,

Thanks for your quick replies.

How would Thursday, November 19, at 10am work for all of you? If it works out better, we could push it to the afternoon that day, but I would just assume get it over with early.

I will work to get my dissertation to all of you at least a week in advance of that date, if not sooner.

Also FYI, I will be giving a departmental seminar the day before, Wednesday November 18 at 4pm in the Heep Center.

Thanks everyone,

Esten

----- Original Message -----
From: "Stephen R. King" <srking@tamu.edu>
To: "Bill Rooney" <wlr@tamu.edu>, [redacted], "Scott Finlayson" <sfinlayson@tamu.edu>
Cc: "Dirk Hays" <dbhays@tamu.edu>
Sent: Tuesday, October 27, 2009 7:01:46 PM GMT -06:00 US/Canada Central
Subject: RE: Defense

The week of the 15th will work for me as well, but it will need to be either Tue after 9, Wednesday after noon, or anytime Thursday or Friday.

The 25th could work as well, since I'll probably cancel my Wednesday morning class.

Steve

-----Original Message-----
From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Tuesday, October 27, 2009 6:28 PM
To: [redacted] 'Scott Finlayson'; 'Stephen King'
Cc: 'Dirk Hays'
Subject: RE: Defense

Esten

The week of November 15 is the best week for me. I could also have the defense on Wednesday November 25.

Regards,

Bill

-----Original Message-----
From: [redacted]
Sent: Tuesday, October 27, 2009 10:51 AM
To: Scott Finlayson; Bill Rooney; Stephen King
Cc: Dirk Hays
Subject: Defense

Hello all,

I am working diligently on my dissertation and would like to go ahead and plan a defense date for November if possible. I feel that anytime after the November 15th should give me enough time to get you a decent copy with enough advanced time.

If you could, please let me know your availability for anytime November 16th through the end of the month (with the exception of Thanksgiving, Thursday 26th of course.). If this doesn't work, the beginning of December might be another option.

I have decided to accept a job with CIMMYT, based in Mexico, starting this spring. It is a post-doc position in wheat breeding/genetics, and will be up to a three year position, depending on how it works out. I'm excited and nervous about this position at the same time, but am looking forward to the adventure and think the position will open up literally a world of opportunity.

Thanks everyone,

Esten

--
[redacted]
Ph.D. Candidate
Molecular and Environmental Plant Sciences
Department of Soil and Crop Sciences
Texas A&M University
Heep Center 2474 TAMU
College Station, TX
[redacted]

--
[redacted]
Ph.D. Candidate
Molecular and Environmental Plant Sciences
Department of Soil and Crop Sciences
Texas A&M University
Heep Center 2474 TAMU
College Station, TX
[redacted]

--
[redacted]
Ph.D. Candidate
Molecular and Environmental Plant Sciences
Department of Soil and Crop Sciences
Texas A&M University
Heep Center 2474 TAMU
College Station, TX
[redacted]

From: Bill Rooney
To: "Sonnie Feagley"
Subject: RE: ProCard receipt
Date: Sunday, November 01, 2009 7:02:44 PM

I expect they'll send us an invoice, but it maybe a month or so. I'll know more tomorrow.

Bill

-----Original Message-----
From: Sonnie Feagley [mailto:sk-feagley@tamu.edu]
Sent: Sunday, November 01, 2009 12:40 PM
To: Bill L Rooney
Subject: Re: ProCard receipt

Hi Dr. Rooney,

Do you know if they will send an actual invoice or this will be it?

Thank you for providing this. I have printed it off and put it in your folder.

Hope you enjoy this beautiful weather.

Sonnie

>>> "Bill Rooney" <wlr@tamu.edu> 11/1/2009 11:26 AM >>>
Sonnie:

Please find attached a future charge on my procard.

There are three color figures so as I calculate the charges, it will be $1450.

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: "Editorial Office"
Subject: RE: 09-105
Date: Sunday, November 01, 2009 11:07:00 AM

Alistair:

All files are uploaded and final. I assume that you have the copyright files from all authors as they were sent in September. I'll send the color figure authorization tomorrow.

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: Editorial Office [redacted]
Sent: Monday, October 26, 2009 12:46 PM
To: wlr@tamu.edu
Subject: 09-105

Dear William Rooney :

Re: 09-105
Early-generation Germplasm Introgression from Sorghum macrospermum into Sorghum (S. bicolor) Les LCK Kuhlman, Byron BLB Burson, David Stelly, Patricia Klein, Robert R Klein, Harold James H.J. Price, and William WLR Rooney

We are short on manuscripts for our January issue and we should be able to get you in that issue if you can upload your files and return the attacfhed form within the next couple of days.

Sincerely,
Alistair Coulthard
Assistant to the Editor
GENOME

From: Bill Rooney
To: "Joan Frederick"
Cc: "John Yohe"; "Vilma Ruth Calderon"; "Diane Sullivan"
Subject: RE: Vilma Calderon
Date: Wednesday, November 11, 2009 10:13:00 AM
Attachments: image002.png
image003.png

Joan:

Here are my recommendations, pending approval from Vilma as well.

1. We should pay her directly, as we do for Rene's services.
2. It should not go through CENTA, I suspect it would not get added to Vilma's salary.
3. She will have to provide the wire transfer information.

Vilma, please correct anything that is wrong.

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: Joan Frederick [mailto:jfrederi@unlnotes.unl.edu]
Sent: Wednesday, November 11, 2009 9:31 AM
To: Bill Rooney
Cc: 'John Yohe'; 'Vilma Ruth Calderon'; Diane Sullivan
Subject: Re: Vilma Calderon

Bill Rooney,

Refresh my memory.....1) do we want to pay her directly like we do for Rene? or 2) does it have to go through the regional program (CENTA) and they add it on to her current salary. Our fiscal year started October 1, 2009.

If 1) we just need her to fill out the wire transfer form and we would send directly to her account - probably 3-4 months at a time, like we handle Rene's.
(See attached file: Bank Wire Form.doc)

if 2) we can send the funds to CENTA under our MOU, for a one year period, and ask them to facilitate payment directly to her with her regular salary.

Will wait to hear back from you.

==========

Joan Frederick

INTSORMIL
University of Nebraska
114 BCH
Lincoln NE 68583-0748
402-472-7058
jfrederick1@unl.edu

"Bill Rooney" ---11/10/2009 03:48:06 PM---Joan and John:

From: "Bill Rooney" <wlr@tamu.edu>
To: "'Joan Frederick'" <jfrederi@unlnotes.unl.edu>, "'John Yohe'" <jyohe@unlnotes.unl.edu>
Cc: "'Vilma Ruth Calderon'" <[redacted]
Date: 11/10/2009 03:48 PM
Subject: Vilma Calderon

Joan and John:

As we discussed, I need to make arrangements to supplement the salary of Vilma Ruth Calderon of CENTA. We had agreed upon $600/month payment from the Central American regional funds effective at that beginning of the new fiscal year.

I wanted to follow up and see if there is anything else I need to do and to provide Vilma with some idea of how we will actually make payments.

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: "sethmurray@neo.tamu.edu"; "Mullet, John E"; "Patricia Klein"
Cc: "Schuerman, Peter L."; "McCutchen, Bill"; Avant, Bob; "Simpson, Shay"
Subject: FW: TAMU sweet sorghum study
Date: Tuesday, November 10, 2009 2:08:00 PM

Greetings:

Please forgive me if we discussed this previously, but I need input from the group per the request from I don't remember if we had a discussion pertaining to Cere's request for phenotype information on sweet sorghum (see below). This would affect some the data that Seth collected as well as some of our current data.

I want to be a good collaborator; at the same time we can just turn everything over for the sake of collaboration. I would welcome your input on what level we should participate and what agreements we make any transfers under. Seth, with regard to your information, I'd like to know if you are even interested in sharing that data.

Regards,

Bill

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

From: Timothy Swaller [mailto:tswaller@ceres.net]
Sent: Tuesday, November 10, 2009 12:17 PM
To: Bill Rooney
Cc: Jeff Gwyn; Walter Nelson; John Mullet
Subject: TAMU sweet sorghum study

Hi Bill

I am following up on a request that was made a few months back in regards to a population that was phenotyped (NIR, Brix, and height) from 125 diverse accessions and some preliminary marker associations were made (Seth?). Is it possible to get this raw phenotypic information for these 125 accessions (I believe you had mentioned it was going to be available soon)?
We would like to start looking at these types of datasets to begin developing a better comprehensive understanding of these types of studies and the utility they may have for our internal and/or joint programs. Also, this will help us to better understand the benefits and weaknesses of these approaches.

Thanks
Tim

Timothy Swaller
Director, IT and Genomics
Office: 805.376.6545
tswaller@ceres.net

Ceres, Inc. ~ The Energy Crop Company®
1535 Rancho Conejo Blvd. ~ Thousand Oaks, CA 91320 USA
www.ceres.net

From: Bill Rooney
To: "Timothy Swaller"
Subject: RE: TAMU sweet sorghum study
Date: Tuesday, November 10, 2009 1:59:00 PM

Tim:

I remember asking Seth about the availability of that dataset, but I don't remember if I ever got an answer. I'll check into that and see where it stands.

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: Timothy Swaller [mailto:tswaller@ceres.net]
Sent: Tuesday, November 10, 2009 12:17 PM
To: Bill Rooney
Cc: Jeff Gwyn; Walter Nelson; John Mullet
Subject: TAMU sweet sorghum study

Hi Bill

I am following up on a request that was made a few months back in regards to a population that was phenotyped (NIR, Brix, and height) from 125 diverse accessions and some preliminary marker associations were made (Seth?). Is it possible to get this raw phenotypic information for these 125 accessions (I believe you had mentioned it was going to be available soon)?
We would like to start looking at these types of datasets to begin developing a better comprehensive understanding of these types of studies and the utility they may have for our internal and/or joint programs. Also, this will help us to better understand the benefits and weaknesses of these approaches.

Thanks
Tim

Timothy Swaller
Director, IT and Genomics
Office: 805.376.6545
tswaller@ceres.net

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1535 Rancho Conejo Blvd. ~ Thousand Oaks, CA 91320 USA
www.ceres.net

From: Bill Rooney
To: "Alves, Maria"
Subject: RE: Visit of Geraldo Eugenio
Date: Thursday, November 12, 2009 9:37:00 PM

I'll be there for the 3:30 meeting.

Regards,
Bill

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

From: Alves, Maria [mailto:malves@ipomail.tamu.edu]
Sent: Thursday, November 12, 2009 5:12 PM
To: lrooney@tamu.edu; wlr@tamu.edu; s-feagley@tamu.edu; jfedwards.cvm@tamu.edu
Cc: [redacted]
Subject: Visit of Geraldo Eugenio

Dear all,

Please find attached the itinerary for Dr. Geraldo Eugenio's visit to Texas A&M.
Please let me know if you have any questions or suggestions.

Thanks,
Maria

Maria Alves
Program Manager for South America, Office for Latin America Programs
Texas A&M University

204 Coke Building | 4251 TAMU
College Station, TX 77843-4251 | USA
Tel. +1 979.845.3367 | Fax. +1 979.845.6228
Email: malves@tamu.edu | Web http://olap.tamu.edu

Welcome to Aggieland

From: Bill Rooney
To: "Ken Davenport"
Subject: tomorrow
Date: Thursday, November 12, 2009 8:36:00 PM

Ken:

I assume we are still on for tomorrow. I'm at the Hilton Garden Inn. You can call me tomorrow morning. I don't remember when we were scheduled to start, but I'll be ready anytime after 7 am. Cell 979 220 1951

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: "Scott Vajdak"
Subject: RE: HP netbook
Date: Thursday, November 12, 2009 8:33:00 PM

Good, I'll get it on Monday.

Thanks much. I appreciate it.

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
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-----Original Message-----
From: Scott Vajdak [mailto:SVajdak@ag.tamu.edu]
Sent: Thursday, November 12, 2009 10:30 AM
To: Bill L Rooney
Subject: HP netbook

Morning Dr. Rooney,

I was able to get your HP Mini back up and running fine this morning. I had to manually remove all traces of Symantec in order for it to successfully complete the install. Once I got it running I reloaded the driver for that internal wireless mobile broadband card. Typically you don't install a driver unless you see the item listed in device manager so that was a little confusing at first. Afterwards things are looking good; you can connect, Symantec is running and updating and all of your files are still in your My Documents folder.

It will be ready for you when you return.
-Scott-

From: Bill Rooney
To: "dustin borden"; "Delroy Collins"
Subject: FW: Goddard, KS
Date: Thursday, November 12, 2009 8:32:00 PM

Can you provide Lea Dell with a list of people who went to Kansas and need reimbursement?

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: Lea Dell Morris [mailto:LMorris@ag.tamu.edu]
Sent: Thursday, November 12, 2009 1:27 PM
To: Bill Rooney
Subject: Goddard, KS

Dr. Rooney,

I'm trying to get lodging receipts for the trip to Goddard, KS (Sept.13 & 14) but I need to know who all went.

Thanks!

From: Bill Rooney
To: "George L Hodnett"
Subject: RE: trip to Bolivia
Date: Thursday, November 12, 2009 8:31:00 PM

He had mentioned a trip to Bolivia. He wanted several of us to go in early November, but I told Bill Lyles that I simply couldn't make that trip this year.

That's where I left it.

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: George L Hodnett [mailto:ghodnett@ag.tamu.edu]
Sent: Thursday, November 12, 2009 11:26 AM
To: wlr@tamu.edu
Subject: trip to Bolivia

Bill,

Do you know anything about a trip to Bolivia sponsored by Jean Carlo Landivar?

George

From: Bill Rooney
To: "Hall, Susan R"
Subject: RE: sorghum thresher
Date: Thursday, November 12, 2009 8:30:00 PM

We do those by hand as well. Use a block with a serrate rubber mat.

I don't know where to get a smaller thresher than what we have unless you invest in a belt thresher, which is expensive (5K) and takes a few months to get one.
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: Hall, Susan R [mailto:susan-hall@neo.tamu.edu]
Sent: Thursday, November 12, 2009 10:56 AM
To: Rooney Bill
Subject: sorghum thresher

Good Morning Bill,

Any idea where we can get a small sorghum thresher --- alot of our tilling lines have 2-50 seeds on each head so we can't risk losing much if any of the seed. We are currently doing this by hand but we have so many it is taking tons of time.

Hope all is well in your world!
Susan

From: Bill Rooney
To: "Gary C Peterson"
Subject: RE: Seed Request
Date: Thursday, November 12, 2009 6:39:00 AM

Gary:

Yes, we can provide the seed. Just send the phyto and we'll fill and send back.

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: Gary C Peterson [mailto:g-peterson1@tamu.edu]
Sent: Thursday, November 12, 2009 6:11 AM
To: Bill L Rooney
Subject: Seed Request

Bill,

I am at Free State planning future research and graduate training with Neal, John Leslie and Medson.

We would like to do more research on grain mold and start looking at different aspects. As part of the research we would like to look at a set of genotypes that represent most of the different grain traits in sorghum. Would it be possible for you to send 50g of each line in the Genetics of Pericarp nursery to Neal? We will add a tan, lemon yellow and a couple of tan, red. If you can fill the request Neal will obtain the phyto in next couple of days. Neal needs the seed at Bloem by Nov 30.

Thanks.

Gary

Gary C. Peterson
Professor
g-peterson1@tamu.edu
tel: 806-746-4019
fax: 806-746-6528

From: Bill Rooney
To: "Kerry Mayfield"; "sethmurray@neo.tamu.edu"
Subject: oral exam
Date: Wednesday, November 11, 2009 6:00:00 PM

Gary Odvody reminded me that I held Nov 23 for your oral.

That being said it is filling up fast. I can attend you exam anytime between 11 and 3. Hopefully that works for the remainder of your 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

From: Bill Rooney
To: "ted kabat"
Subject: RE: Ted Kabat Sorghum Genetics
Date: Wednesday, November 11, 2009 5:58:00 PM

Ted – I'll be in the office all of next week. You can call me at your convenience and we can visit.

Brief comments below.

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: ted kabat [redacted]
Sent: Wednesday, November 11, 2009 2:41 PM
To: wlr@tamu.edu
Subject: FW: Ted Kabat Sorghum Genetics

Bill, I was refered to you by Rich Kochenower from Ok. I used to work with Terry Pitts from Gustafson and was severed when Bayer puchased the rest of the company. I do project work now and am doing an update on sorghum genetics. Who is developing them, and which cos license them. I understand there are many varieties available from the Univ. system as well. When would be a good time to talk.
Below is infomation I have put together thus far. I'd appreciate your comments.

Thanks, Ted Kabat

Market Size:

The US market is estimated @ 11MM total acres. Including 7MM grain, 1MM forage sorghum and 3MM sorghum sudangrass.

Of the 21 sorghum-producing states, the top five in 2007 were:

1. Kansas
2. Texas
3. Nebraska
4. Louisiana
5. Oklahoma

The Sorghum Belt runs from South Dakota to Southern Texas and the crop is grown primarily on dryland acres. Over the years, sorghum has been either exported, used in animal feed domestically or utilized in industrial and food uses. In recent years, sorghum's use in the ethanol market has seen tremendous growth, with 30 to 35 percent of domestic sorghum going to ethanol production.

Seed Genetics

Just a few years ago the market was 95% grain and 5% Sudan Grass, but with the high prices for corn since the government support of corn for ethanol it is now 40% grain and

60% grass. More and more dairy producers have recognized the economics of the brown midrib varieties and the return per acre on most sorghum grasses.

Seeding Rates

4-7 lb/acre Grain
4-7 lb/acre Forage silage
20lb/acre Sudan Grass

Cost/50lb unit of seed

$80/unit Grain
$100/unit Forage silage
$60/unit Sudan Grass

Growth Stages:

Refer to Nat'l Sorghum Boards "Checklist for Porfitable Sorghum Production".

Sorghum has a low tolerance for cold and needs a min of 65, 60 min for germination
30 days- Anthesis(flower development)-Key growth stage for high sorghum grain yields is 35 days after emergence.
30 days latter Black Layer develops
15-30 days latter grain is dry

Sorghum Genetics

15-20 years ago companies exchanged genetics via IPM program that was shut down. NC+ had sourced from Advanta, Sorghum Partners, and Crosbyton.

Pioneer Does not license in or out
Licences to Asgrow, Dekalb, and other ASI cos. Does not license in
Dow Small player
Crosbyton Seed Licenses in approx 10%, none out
Obtains all genetics from the MMR side of the business. Do not license or out. Dr Fred Miller coordinates all aspects of breeding
Does all contract production, major customer is Syngenta. All programs are kept in house
25% licensed in and out
Univ., mainly NE, OK, KS, Tx have developed new varieties but want an upfront fee of $10,000 and then after the seed company develops the genetics will negotiate an agreement. Most companies want no part of this approach.

I'm not sure on all of your information or if something is missing – you summary implies that MMR licenses to Crosbtyon but I'm pretty sure that is not true. MMR licenses to several people but Crosbyton is not one of them.

With regard to the companies accessing germplasm, more and more are accessing material at this time. The number are much higher than they were 3-4 years ago. Yes, there is a charge for the material but it is negotiable and it is not as high as is listed. There are also quite a few smaller players that are engaged in hybrid development by using public material under contract (lines not released but distributed)

Doane did a study in 2006 re what trait preferences growers wanted most. Clearly 2 BioTech traits were preferred:
BT for Greenbug control (39.5 %)
Roundup Ready Herbicide Tolerance (38.4%)
Other preferences were Poast Herbicide tolerance (11%), and IMI tolerance (6.9%)
Conversations with seed producers indicates there is a need for more post emergent herbicides to clean up weeds once a crop has been established.

Ted Kabat 15 Main Street Hatfield, Mass 01038 tel/fax 413-247-5241 cell 817-366-3118
[redacted]

From: Bill Rooney
To: "James L Heilman"
Subject: RE: South Dakota State U account
Date: Wednesday, November 11, 2009 3:29:00 PM

Yes, it appears so. If they told me, I didn't get the message.

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: James L Heilman [mailto:j-heilman@tamu.edu]
Sent: Wednesday, November 11, 2009 3:18 PM
To: Bill L Rooney
Subject: RE: South Dakota State U account

So the money's been here for 2 months, and nobody in contracts and grants bothered to notify you. Amazing!

>>> "Bill Rooney" <wlr@tamu.edu> 11/11/2009 1:06 PM >>>
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 , 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 87060 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:,
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epartment:,SCSC ,Flags: D F B C Z G ABR,, Net Dir BBA:,
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001 Revenue Pool ,, 223000- 32304-, ,
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*** Total Revenue ,, 223000- 32304-, ,
190696-
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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
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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

From: Bill Rooney
To: "Rene Clara"
Subject: RE: My visit to Guatemala
Date: Wednesday, November 11, 2009 1:06:00 PM

Rene:

Thanks for the update. We should discuss Guatamala and Honduras during my visit.

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: Rene Clara [redacted]
Sent: Wednesday, November 11, 2009 10:19 AM
To: Bill Rooney
Subject: My visit to Guatemala

Dear Dr. Bill,

In my visit to ICTA and PROSEMILLAS of Guatemala (October 27-29), I inform you the activities that are realized with the technical assistance of INTSORMIL:

ICTA

- They are evaluating varieties of double purpose (grain and forage) to be able to liberate one in the short term.
- They are evaluating the hybrids of the PCCMCA 2009 trial, of the seeds companies.
- They are increasing seed of a early variety of Dr. Gilles Trouché, to be validated at national level in Guatemala.

ICTA has more needs but it has no funds to extend his program of sorghum.

PROSEMILLAS

- They are doing investigation in seed production of the hybrid of white grain of excellent grain quality, ESHG-3 (ICSA 613*86 EO 361), to produce it in the short term as SR-450.
- They are producing 15 tm of the variety Soberano (Diamante) and 15 tm of the RCV variety (Oro Blanco).
- They are producing 8 tm of the sorghum forrajero “Sweet Grass” (ICSA 613*TX2784).
- They are producing 0.5 tm of the variety Pacific BMR of an Australian company.
- They are evaluating the hybrids of the PCCMCA 2009 of the seeds companies, including the ESHG-3 with the name SR-450.

I think that we should help with few funds to the ICTA next year, therefore the economic

crisis has struck enough to that country and themselves do not they recover.

Regards,

René Clará V.
INTSORMIL
Host Regional Coordinator

CENTA, Apdo. Postal 885,
San Salvador, El Salvador, C.A.
Tel. (503) 2302 0239 - (503) 7815 2238 cel.
Fax: (503) 2302 0239

E-mail [redacted]

From: Bill Rooney
To: "Rafael Nieves"
Subject: RE: Trip Report
Date: Wednesday, November 11, 2009 12:53:00 PM

Rafael:

I'm traveling and won't be able to work on it until the return home on Friday. I should have you the report by Sunday.

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: Rafael Nieves [redacted]
Sent: Tuesday, November 10, 2009 5:42 PM
To: 'Bill Rooney'
Cc: 'Mark Yancey'
Subject: Trip Report

Good afternoon Bill,

I hope you made it back safely and were able to supervise the serving of the hot dogs at the game in time. I just wanted to urge you to please provide to me your trip report by the end of this week so I can incorporate your comments to the Task 2 deliverable. I have already received Areg's and Bob's.

Cheers,
Rafael

From: Bill Rooney
To: "Gerald De La Fuente"
Subject: RE: Grad School
Date: Wednesday, November 11, 2009 12:51:00 PM

Gerald:

I'm out for the rest of the week, but I'll be in town all of next week. Monday and Wednesday are good days.

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: Gerald De La Fuente [redacted]
Sent: Wednesday, November 11, 2009 10:19 AM
To: wlr@tamu.edu
Subject: Grad School

Good morning Dr. Rooney:

After exchanging some e-mails with faculty from out of state schools and speaking with current graduate students the consensus seems to be that it would be foolish for me to leave Texas A&M after I finish with my undergrad. You and Dr. Murray are thought of very highly by other schools and the faculty I spoke with said that I would be doing myself a disservice to not get a degree under you or Dr. Murray. So unless something drastically changes I think that it would be wise of me to stay here at Texas A&M for my masters. The faculty from other schools said they would love to have me after this. You had mentioned that if I decided to stay that you wanted me to give your program a shot, so I would like to sit down with you and discuss whether or not you will have a spot available for me and the funding to take me on. Dr. Murray has mentioned to me that he just recieved some funding that might work out for me so I would like to see what you can offer and then go from there.

I managed to finalize my schedule for the next two semesters and managed to put all of my classes except for one into the sring of 2010 and the fall of 2010. You had mentioned that it would be possible for me to start collecting data this upcoming growing season, if this is the case the department has said that I can enroll in a research class over the summer so that I will be available full time to work. That is of course with your approval. I know you are very busy Dr. Rooney, but if you have any free time during the day that you are willing to use to sit down with me I would really appreciate it. I would also like to thank you for all of the advice and guidance you have given me, I really aprreciate it. Have a great day.

Regards,

Gerald

From: Bill Rooney
To: "James L Heilman"
Subject: RE: Funding
Date: Wednesday, November 11, 2009 10:49:00 AM

Well, some money arrived, but I'm not sure it is the correct amount. That is why I've asked Pam to reconcile what we received with what the budget indicated.

Once that is done, we'll have clarification.

I'm sorry this has taken so long.

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: James L Heilman [mailto:j-heilman@tamu.edu]
Sent: Wednesday, November 11, 2009 10:24 AM
To: Bill L Rooney
Subject: Funding

Bill,

Have you found out if the funding is here?

JLH

From: Bill Rooney
To: "DoKyoung Lee"
Subject: RE: Visiting IL
Date: Wednesday, November 11, 2009 9:44:00 AM

Thanks, DK

Looking forward to the visit.

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: DoKyoung Lee [mailto:leedk@illinois.edu]
Sent: Wednesday, November 11, 2009 7:09 AM
To: 'Bill Rooney'
Subject: Visiting IL

Dear Bill,

I will pick you up at the air port. If you need me you can call me anytime on my cell, 217-[redacted]
Thanks,

D.K.

DoKyoung "D.K." Lee
Assistant Professor of Biomass and Bioenergy Crop Production
Department of Crop Sciences, University of Illinois
S-320 Turner Hall, MC-046
1102 South Goodwin Avenue
Urbana, Illinois 61801
217-333-7736/Fax: 217-333-5299

From: Bill Rooney
To: [redacted]
Cc: "John Mullet"
Subject: RE: Leo"s sampling
Date: Wednesday, November 11, 2009 7:13:00 AM

Leo

Did you collect biomass samples of the "late" selections that we coded to send to PR?

These were the ones that looked really good late in the season (after the rains)....

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: John Mullet [mailto:jmullet@tamu.edu]
Sent: Wednesday, November 11, 2009 7:11 AM
To: Bill Rooney
Subject: Re: [redacted] sampling

Bill,

Did Leo collect any samples for NIR composition analysis on these
materials or was this just to select potentially new R-lines?

Thanks,
John
On Nov 11, 2009, at 6:13 AM, Bill Rooney wrote:

> John:
>
> We noticed the same thing as well, so we went back and looked at his
> monthly
> desirability ratings and basically came up with a "recovery" rating
> - things
> that weren't all that great in the summer but really responded to the
> moisture in the fall. From that we coded about 10 lines that we
> felt were
> the best and they will be in Puerto Rico this winter.
>
> 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: John Mullet [mailto:jmullet@tamu.edu]
> Sent: Tuesday, November 10, 2009 6:30 PM
> To: Bill Rooney
> Subject: [redacted] sampling
>
> Bill,
>
> I walked through Leo's germplasm grow out today. Some lines were
> pretty drought tolerant and recovered well.
>
> What trait data is Leo taking on this material if any? (I know he was
> assaying flowering time)
>
> Thanks,
>
> John
>

From: Bill Rooney
To: "jlindle@purdue.edu"
Subject: RE: student research with sorghum
Date: Wednesday, November 11, 2009 6:44:00 AM

Jacob:

There are certain types of sorghum that are better for popping than others. However, probably the most important factor is the environment in which the grain is grown and the moisture content in the grain when you actually try to pop it.

Grain produced in a drier environment is generally better quality for popping; moisture content in the grain between 11-12% is best for popping. Fresh grain pops better than stored grain. Generally, what you want is a quite hard endosperm sorghum with a small amount of soft endosperm in the middle (just like popcorn). Having said that, I've never seen sorghum of any type pop as efficiently as commercial popcorn. That doesn't mean that sorghum can't pop like that, it just means that the genotypes have not been optimized to the level that popcorn has.

Another way to increase the efficiency of popping is to add pressure to the heating process and then remove it rapidly at a critical time. I've not done that but I know several who are popping sorghum commercially have used this approach to enhance their efficiency.

You've got two great sorghum breeders there at Purdue (Gebisa Ejeta and Mitch Tuinstra) they should be able to provide you with grain of some of the better types to try.

Best of luck.

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: jlindle@purdue.edu [mailto:jlindle@purdue.edu]
Sent: Monday, November 09, 2009 1:10 PM
To: wlr@tamu.edu
Subject: student research with sorghum

Hello there, Dr. Bill Rooney!

My name is Jacob Lindley and I am a student here at Purdue University. I spoke with a gentleman named Morris Bitzer, on 11-08-09, wondering about the different types on grain strains that might be better for popping. He pointed me in your direction.

I am very interested in the popping nature of sorghum and its ever growing popularity. Mr. Rooney, I dream of being an entrepreneur and I am using this idea for the Burton D Morgan Business Plan Competition. I have already done some experiments with some white sorghum that I obtained from Twin Valley Mills in Nebraska. Unfortunately I am not getting a high enough percent yield,

meaning I cant get enough of the seeds to pop.

I am wondering if you would be able to help me out in discovering the best sorghum grain type for popping. I am thinking that the moisture content is a huge factor, along with shell thickness. I also know that they prepare popped sorghum as a custom in Ethiopia, and that the Milo variety originated from east Africa.

If you have any insights, I would be more than thrilled to hear from you. Thank you for your time.

sincerely,
Jacob Lindley

From: Bill Rooney
To: "John Mullet"
Subject: RE: Leo"s sampling
Date: Wednesday, November 11, 2009 6:13:00 AM

John:

We noticed the same thing as well, so we went back and looked at his monthly desirability ratings and basically came up with a "recovery" rating - things that weren't all that great in the summer but really responded to the moisture in the fall. From that we coded about 10 lines that we felt were the best and they will be in Puerto Rico this winter.

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: John Mullet [mailto:jmullet@tamu.edu]
Sent: Tuesday, November 10, 2009 6:30 PM
To: Bill Rooney
Subject: [redacted] sampling

Bill,

I walked through Leo's germplasm grow out today. Some lines were pretty drought tolerant and recovered well.

What trait data is [redacted] taking on this material if any? (I know he was assaying flowering time)

Thanks,

John

From:	Bill Rooney
To:	"Glenda Kurten"
Subject:	RE: Faculty teaching classes this sem. - Weekly flu reporting
Date:	Wednesday, November 11, 2009 6:11:00 AM

0

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: Glenda Kurten [mailto:g-kurten@tamu.edu]
Sent: Wednesday, November 11, 2009 5:22 AM
Cc: Kathy Ferguson
Subject: Faculty teaching classes this sem. - Weekly flu reporting

Please let me know numbers of students in your classes that you suspect or know have the flu this past week. If you will respond by the end of the day Wed, I will compile and send the numbers over Thurs morning.

Thanks for your help,
Glenda

Glenda Kurten
Business Coordinator II - Instruction
Soil and Crop Sciences &
MEPS Program
979/845-3342
Fax: 979/458-0533
E-mail g-kurten@tamu.edu

From: Bill Rooney
To: "Robert Harris"
Subject: RE: Preparationfor our talk.
Date: Tuesday, November 10, 2009 5:24:00 PM

Well, what can I say? Too many points between the two groups that are just different.

Agrilife has finite timelines on all agreements. It doesn't affect any particular licenses, just the general agreement. So, if you were to license a line or technology, then that line or technology is yours for use until that licensing agreement expires or it is terminated per the agreement. That license would likely outlive the life of the general agreement.

I'm not commenting on whether this is logical, it is just the approach that they are using (and have used).

My schedule is about to settle a little. I'd like to visit with you about moving forward (with or without TAMU).

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: Robert Harris [redacted]
Sent: Monday, November 09, 2009 2:40 PM
To: Bill Rooney
Subject: Fw: Preparationfor our talk.

I cannot believe this guy.

Bob
----- Original Message -----
From: Schuerman, Peter L.
To: Robert Harris ; McCutchen, Bill
Sent: Monday, November 09, 2009 2:58 PM
Subject: RE: Preparationfor our talk.

Bob, thanks for this. The problem I notice is the following:

4. NIC/SPK will be the exclusive and perpetual licensee for sorghum product and varieties developed by the University and that A&M will use its best efforts to develop same.

We can commit the sorghum we have now to a license, but we can't commit future varieties in this way. We need to consider each variety as it is developed.

If we develop new varieties and we have a successful partnership, undoubtedly we will want to license new varieties to NIC/SPK. And under sponsored research funding to develop these new varieties, we can provide rights to the sponsor in the sorghum that is developed. How would you like to proceed?

-Peter

From: Robert Harris [mailto[redacted]
Sent: Sunday, November 08, 2009 10:28 PM
To: Peter Schuerman; McCutchen, Bill
Subject: Preparationfor our talk.

Dear Peter and Bill,

Confirming our talk last week, we seemed to find basic general agreement on these key issues:

1. We will pay royalties on any product or sorghum variety which the IP is owned by the University and licensed to SPK/NIC. Such royalties will be based on the IP actually used by us in similar fashion to the oil we used (developed by Brandeis) in our Smart Balance products.

2. And fees or cash payments or contributions we make to A&M to help support research and sorghum development will not be related to the royalty payments to be paid by NIC/SPK.

3. Such contributions will be paid by our charitable foundation as pure research support to help you create healthful sorghum varieties and products - to be used in foods, drugs, nutraceuticals, etc.

4. NIC/SPK will be the exclusive and perpetual licensee for sorghum product and varieties developed by the University and that A&M will use its best efforts to develop same.

Since I promised to lay out our proposed royalties and contributions before our next talk so that we do not imply more than is practical or sensible, this is what we are open to do in order to lock up this agreement without further delay:

Basic Plan for Royalties

Based on pounds of sorghum bran or whole grain used in any foods, or any type of product the sorghums licensed by NIC/SPK, the IP of which is the property of A&M. Naturally, the formulations calling for the sorghum ingredient will dictate the absolute royalty paid - predicated on amount to be used per product and identified as such in any and all products marketed by NIC/SPK. In addition, any product of sorghum material sublicensed by NIC/SPK to a third party (as discussed last week), the amount of royalty will of necessity be less since we must administer and manage such programs (if in our judgment it is useful to sub-license third parties):

Direct Royalties:

No patent protection: 50-points per pound of sorghum used in direct formulations (in products marketed by NIC/SPK).
Patent Protection: 75 points per pound of sorghum used in direct formulations
Sublicense - no patent: 25 points per pound
Sublicense - patent protection: 50 points per pound

Contributions from CRH Foundation

2009 - $25,000 in one payment.
2010- 50.000 in two payments
2011- 50,000 in two payments
2012- 50.000 in two payments
2013 - 25,000 in one payment

We are scheduled for a conference call this Thursday, November 12 and can complete this negotiation at that time. It would be to our mutual advantage to start the development program in high gear - not only for your black sorghum program but also to develop a hybrid of sumac sorghum with higher antioxidant levels than the sorghum we now use so that we may replace it with a sumac hybrid and escalate the royalty payments to you.

Bob Harris

From: Bill Rooney
To: "Lunt, David"
Cc: "Baltensperger, David"; "Nessler, Craig"; "McCutchen, Bill"
Subject: RE: Ag Conference
Date: Tuesday, November 10, 2009 5:20:00 PM

Dr. Lunt:

I thank you and the Director's office for the invitation. I am happy to accept the invitation and speak at the General Session.

I'll be traveling for the remainder of this week, but I'll be in the office all of next 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: Lunt, David [mailto:d-lunt@tamu.edu]
Sent: Monday, November 09, 2009 2:50 PM
To: wlr@tamu.edu
Cc: Baltensperger, David; Nessler, Craig; McCutchen, Bill
Subject: Ag Conference

Dr. Rooney,

The Director has invited you to give an overview of your current and future research during the Research General Session of Ag Conference. The Research General Session will be held on Tuesday afternoon, January 12, from 1:30 – 5:00 PM. You will be allotted 30 minutes. Please confirm your willingness and availability to accept this invitation by the end of this week (d-lunt@tamu.edu). I will follow up by telephone to further discuss this opportunity.

****

David K. Lunt
Assistant Director
Texas AgriLife Research
Texas A&M System
113 Jack K Williams Administration Building
College Station, TX 77843-2142

TEL: (979) 458-1425
FAX: (979) 458-4765
d-lunt@tamu.edu

From: Bill Rooney
To: "Simpson, Shay"
Subject: timeline for Ceres meeting
Date: Tuesday, November 10, 2009 4:39:00 PM

Shay:

Any finalization on the timeline for the Ceres meeting?

I've been asked to speak at the Agrilife General Session on Tuesday Jan. 12 in the pm. A meeting later in the week still works for me, but wanted to confirm before I accept.

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: "Lloyd Rooney"
Subject: RE: CA report Blurbs?? If you want them?
Date: Tuesday, November 10, 2009 3:52:00 PM

Thanks, I'll use it.

On the sorghum producers money, I assume that we can extend that. Hell, we just got it.

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: Lloyd Rooney [mailto:lrooney@tamu.edu]
Sent: Monday, November 09, 2009 2:05 PM
To: wlr@tamu.edu
Subject: CA report Blurbs?? If you want them?

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 [redacted] 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.

The bland flavor and white color of the major sorghum varieties allow sorghum flour to compete favorably for use in foods. Thus it can be used as a substituet or diluent of rice. There is increasing interest in use of sorghum for gluten free diets.

From: Bill Rooney
To: "Joan Frederick"; "John Yohe"
Cc: "Vilma Ruth Calderon"
Subject: Vilma Calderon
Date: Tuesday, November 10, 2009 3:47:00 PM

Joan and John:

As we discussed, I need to make arrangements to supplement the salary of Vilma Ruth Calderon of CENTA. We had agreed upon $600/month payment from the Central American regional funds effective at that beginning of the new fiscal year.

I wanted to follow up and see if there is anything else I need to do and to provide Vilma with some idea of how we will actually make payments.

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: "Vilma Ruth Calderon"
Subject: RE: information for annual regional report
Date: Tuesday, November 10, 2009 3:44:00 PM

Thanks so much!

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: Vilma Ruth Calderon [redacted]
Sent: Monday, November 09, 2009 12:10 PM
To: Bill Rooney; LLoyd Rooney
Cc: Rene Clara; Kris Duville
Subject: Re: information for annual regional report

Dr. Rooney

Since march 2008 we have been conducted until now 26 workshops for sorghum utilization for food and flour production, plus 5 more workshops to show Omega VI mills functionality to some interested people. Also we have a large scale sorghum producer and until now approximatly 125 small bakeries are using sorghum flour .These bakeries belongs to the Artisan bakers association (data provided from the president of the bakers association, Nelson Calderon) .
We have also at least 8 small food industries using sorghum in their products.
Imn sending you the presentation that we shown to Dr. Rooney jun 2009, so you can have the data from this presentation.
if you need anything else just let me know.

Vilma Ruth

Vilma Ruth Calderon de Zacatares
MSc en Tecnologia de Alimentos
MSc en Economia Ambiental
Laboratorio de Tecnologia de Alimentos
CENTA, El Salvador
2302-0200 ext 246
[redacted]
vilmita@neo.tamu.edu

From: Bill Rooney <wlr@tamu.edu>
To: Vilma Ruth Calderon [redacted]

Cc: Rene Clara [redacted]
Sent: Sun, November 8, 2009 11:28:30 AM
Subject: information for annual regional report

Vilma:

Can you provide with a list fo the training and extension shortcourses you've done in the past year in El Salvador?

I'm writing the annual regional report and would like to have this information in the report.

Rene, if there are others besides Vilma, can you provide that to me as well?

I need this information by Tuesday.

Thanks,

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: "Rene Clara"; "Vilma Ruth Calderon"; "LLoyd Rooney"
Subject: RE: important information
Date: Tuesday, November 10, 2009 2:19:00 PM

Rene and Vilma

Based on what Rene has stated and since I will be in El Salvador, I can discuss this issue directly with the director at that time.

I think that is probably the best approach; after that visit, if we still need to write, I can write after that meeting.

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: Rene Clara [mailto[redacted]
Sent: Tuesday, November 10, 2009 1:47 PM
To: Vilma Ruth Calderon; LLoyd Rooney; Bill Rooney
Subject: Re: important information

I have chatted with the new CENTA Director and it is very interested in the sorghum flour and thinks to give him more importance to the works of the INTSORMIL.
Really he has announced changes for the next year, but also he has said to me that it will support the CENTA-INTSORMIL
I believe that it is not yet suitable that Dr. Lloyd orders this letter, so if some signs of changes happen, I am going to speak with him to remind him that supports the team of work, as the support that he has promised.

Also Dr. Bill will speak with him next December 4 and also we can tackle this topic.

Regards,

René Clará V.
INTSORMIL
Host Regional Coordinator

CENTA, Apdo. Postal 885,
San Salvador, El Salvador, C.A.
Tel. (503) 2302 0239 - (503) 7815 2238 cel.
Fax: (503) 2302 0239

E-mail:[redacted]

De: Vilma Ruth Calderon [redacted]
Para: LLoyd Rooney <lrooney@tamu.edu>; Bill Rooney <wlr@tamu.edu>
CC: Rene Clara [redacted]
Enviado: mar, noviembre 10, 2009 1:13:04 PM
Asunto: important information

Dr. Rooney

At this moment some changes are ocurring at CENTA because we have new director as i mentioned before. Some people is being relocated or assigned to a new departments. I dont know if this changes are going to affect me, but some people told me that maybe i will be assigned to another unit. It would be good if you send a letter to CENTA's director explaining what we are doing and why is necessary that i will continue working for INTSORMIL.
CENTA's New director's name is Rene Rivera Magana.
Please let me know if you think is convenient or not to send this letter.

thanks

Vilma Ruth Calderon

From: Bill Rooney
To: "Suhas Vyavhare"
Subject: RE: Enquiry letter for PhD
Date: Tuesday, November 10, 2009 1:57:00 PM

Suhas:

Thanks for your interest. At this time, I don't have any openings, but I will keep your resume on file. If something becomes available, I will consider it at that time.

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: Suhas Vyavhare [redacted]
Sent: Tuesday, November 10, 2009 11:11 AM
To: wlr@tamu.edu
Subject: Enquiry letter for PhD

Dear Dr. Rooney,

I am earning my Master's degree in Plant, Soil and Environmental Science at West Texas A&M University in Canyon. I am a graduate research assistant working on integrated pest management with Dr. Bonnie B. Pendleton. For the research for my Master's degree, I am evaluating the stored grain of 26 sorghum genotypes for resistance to maize weevils.

I desire to earn my Ph.D. in plant breeding, particularly in Sorghum. I am very interested in the research you do and believe it would be a great opportunity to work under your guidance. I was wondering if you have an opening for a Ph.D. student for which I might apply. I should be finished with my Master's thesis in summer 2010.

The grade-point average of my Bachelor's degree was 8.3/10 and I am expecting more than a 3.6 GPA for my Master's degree. I have skills and experience working in the field of agriculture for the last eight years that I believe would be an asset in my Ph.D. under your guidance. I have attached my CV with this email.

Thank you for your time, and I look forward to hearing from you soon.

Regards,

[redacted]
Graduate Research Assistant
Department of Agricultural Sciences
West Texas A&M University
Canyon, TX 79016
[redacted]

From: Bill Rooney
To: "mohan gowda"
Subject: RE: exam
Date: Tuesday, November 10, 2009 7:29:00 AM

Got it. I'll read by tomorrow.

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: mohan gowda [redacted]
Sent: Monday, November 09, 2009 7:24 PM
To: Bill Rooney
Subject: Re: exam

Dr.Rooney,
Please find the answer sheet of my exam.

Thanks
Mohan

From: Bill Rooney <wlr@tamu.edu>
To: mohan gowda [redacted]
Sent: Mon, November 9, 2009 8:39:36 AM
Subject: RE: exam

Good luck – questions, please call me.
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: mohan gowda [redacted]
Sent: Monday, November 09, 2009 8:28 AM
To: Dr.Bill Rooney
Subject: exam

Dr.Rooney,
I am waiting for your exam. Would you please send me the question paper.

Thanks

Mohan

From: Bill Rooney
To: "Diane Sullivan"
Subject: RE: Should I pay the invoice for the Ewing III Grinder?
Date: Monday, November 09, 2009 5:49:00 PM

Diane:

Based on Vilma's comments, please go ahead and pay this invoice.

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: Diane Sullivan [mailto:dsulliva@unlnotes.unl.edu]
Sent: Monday, November 09, 2009 1:37 PM
To: wlr@tamu.edu
Subject: Should I pay the invoice for the Ewing III Grinder?

Hello Bill, please let me know. I have the invoice ready to pay with your approval.

==========
Diane Sullivan
INTSORMIL
113 BcH
Lincoln, NE 68583-0748
402-472-6077
HAVE A GREAT DAY!

From: Bill Rooney
To: [redacted]
Subject: FW: Mapping Populations
Date: Monday, November 09, 2009 5:48:00 PM

[redacted]: when you return we need to discuss this request for some of your material.

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: Alex Feltus [mailto:FFELTUS@clemson.edu]
Sent: Monday, November 09, 2009 3:58 PM
To: Bill Rooney
Subject: RE: Mapping Populations

Bill:

I hope you are well. You requested an "Early November" reminder about sorghum tissue.

Let me know if you want me to pay for shipping. Also, if you have any seeds that would be super as we want to map hydrolysis yield potential (HYP) QTLs in more than one environment. Of course I would share all results with your group.

Thank you so much for your help with this,
Alex

--

Alex Feltus, Ph.D.
Assistant Professor
Clemson University - Dept. Genetics & Biochemistry
Biosystems Research Complex Rm 302C
51 New Cherry Street
Clemson, SC 29634
864-656-3231 (office) - (864) 656-6879 (fax)
http://www.clemson.edu/cafls/departments/genbiochem/people/afeltus.html

-----Original Message-----
From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Tuesday, October 13, 2009 2:35 PM
To: Alex Feltus
Subject: RE: Mapping Populations

Yes, I checked with Terry a couple of weeks ago and we will be able to provide you with a ground sample of tissue for testing. It'll be later this fall before we can get everything together, so a reminder in early November would be best.

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: Alex Feltus [mailto:FFELTUS@exchange.clemson.edu]
Sent: Tuesday, October 13, 2009 11:31 AM
To: wlr@tamu.edu
Subject: RE: Mapping Populations

Bill:

I spoke with you a few weeks ago about obtaining seeds/tissue from the mapping populations. I think you mentioned that you going to forward the request to the appropriate people. Is this still a possibility?

Thanks for your time,
Alex

--

Alex Feltus, Ph.D.
Assistant Professor
Clemson University - Dept. Genetics & Biochemistry
Biosystems Research Complex Rm 302C
51 New Cherry Street
Clemson, SC 29634
864-656-3231 (office) - (864) 656-6879 (fax)
http://www.clemson.edu/cafls/departments/genbiochem/people/afeltus.html

-----Original Message-----
From: Alex Feltus
Sent: Wednesday, September 23, 2009 10:01 AM
To: wlr@tamu.edu
Subject: Mapping Populations

Bill:

Nice to speak with you. Working on sorghum genomics with Andy Paterson and Steve Kresovich (et al), I've heard your name fly around a lot over the years. I'm primarily a bioformaticist, but I am actively growing and analyzing sorghum.

We would like to measure sugar hydrolysis yield potential (HYP; sugar release following fungal cellulase treatment) in your mapping populations. We have measured HYP on the USDA diversity panel and have ranked 386 varieties by HYP. My goal is to map genes that improve HYP in sorghum, and I have no plans for mapping soluble sugar genes (but I'd be happy to help from a genomics perspective!).

If you have tissue from whole plant, then we'd need on gram (dry weight) or greater from all the offspring. Alternatively, we could grow out

either RIOx population next year in SC/GA. I'd be happy to pay for shipping.

Thanks again,
Alex

--

Alex Feltus, Ph.D.
Assistant Professor
Clemson University
Department of Genetics & Biochemistry
http://www.clemson.edu/cafls/departments/genbiochem/people/afeltus.html

Biosystems Research Complex Rm 302C
51 New Cherry Street
Clemson, SC 29631
864-656-3231 (office) - (864) 656-6879 (fax)

From: Bill Rooney
To: "dustin borden"
Cc: "Ritter, Kimberley B"; "Hall, Susan R"; "Olson, Sara N"; "Mullet, John E"
Subject: FW: SM80
Date: Monday, November 09, 2009 5:47:00 PM

Dustin:

Please have the guys pull 10 gm of each of the following for Kim/Sara from John Mullet's group. Just let them know when it is ready.

3	98WE919-BK	469	SM80
1	99CS208 388	SM80	
1	99CS15125	109	SM80
1	00CS5732	334	SM80
1	02CS5279	506	SM80
1	03CS295 99	SM80	

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: Ritter, Kimberley B [mailto:kritter@neo.tamu.edu]
Sent: Monday, November 09, 2009 5:06 PM
To: John Mullet
Cc: Susan Hall; Sara Olson; Bill Rooney
Subject: Re: SM80

Hi all,

No, I haven't yet requested further seed of SM80. It'd be great if you could organise this Sara. Thank you!

Just for your info, the last source of SM80 we had was 02CS5279. So if anything later is available it might help with germination??

Cheers,
Kimberley

----- Original Message -----
From: "John Mullet" <jmullet@tamu.edu>
To: "Kimberley Ritter" <kritter@neo.tamu.edu>
Cc: "Susan Hall" <susan-hall@tamu.edu>, "Sara Olson" <sara_olson@tamu.edu>, "Bill Rooney" <wlr@tamu.edu>
Sent: Sunday, November 8, 2009 12:40:09 PM GMT -06:00 US/Canada Central
Subject: SM80

Kimberley,

Have you or Susan requested another seed lot of SM80 from Bill? I know the last one did not germinate, and this genotype is now important for both Ma genotyping and for the 80M mapping study that Sara is working on. She can take the lead in tracking down seed/DNA if you would like?

Thanks,

John

From: Bill Rooney
To: "Lloyd Rooney"
Subject: FW: Sorghum Bran Tannin Antioxidants in Ground Beef
Date: Monday, November 09, 2009 11:31:00 AM

Is this yours or mine?

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: tlchandler@neo.tamu.edu [mailto:tlchandler@neo.tamu.edu]
Sent: Monday, November 09, 2009 11:29 AM
To: Joseph M Awika
Cc: rmiller; wlr@tamu.edu
Subject: Re: Sorghum Bran Tannin Antioxidants in Ground Beef

Dear Drs. Awika, Miller, and Rooney,

I never did receive the email from Dr. Rooney that Dr. Awika referrs to, but based on Dr. Awika and Dr. Miller's schedules it looks as though an hour long meeting on a Monday afternoon would be a good fit. I would like to schedule it for Monday, December 7 at 2pm. I assume that meeting in the Heep building would be most convenient; please let me know where exactly. Also, please let me know if we need to reschedule for any reason.

Thank you,
Tabitha Roybal

----- Original Message -----
From: "Joseph M Awika" <JAwika@ag.tamu.edu>
To: tlchandler@neo.tamu.edu, wlr@tamu.edu
Cc: "rmiller" <rmiller@tamu.edu>
Sent: Friday, November 6, 2009 9:00:00 AM GMT -06:00 US/Canada Central
Subject: Re: Sorghum Bran Tannin Antioxidants in Ground Beef

Tabitha: As Dr Rooney said, I have a fairly tight schedule but can squeeze an hour's meeting (preferably MWF).

Joseph

>>> <tlchandler@neo.tamu.edu> 11/5/2009 4:03 PM >>>
Dear Dr. Rooney and Dr. Awika,

My name is Tabitha Roybal, and I am a graduate student under Dr. Rhonda K. Miller. My research will be an extension of the work that Shannon Bennett has been doing with natural tannin sources as added antioxidants in ground beef. Dr. Miller would like me to work with different sorghum bran as tannin sources. I am planning to start some preliminary work at the first of the year, and hoping to begin my project sometime around late January if possible. I would like to set up a meeting with the two of you to gain a better understanding of which sorghum brans I should consider including in my proposal, as well as recommended treatment levels. A few dates/times that work well for me include:
Thursday, November 19 after 1pm

Tuesday, December 8 after 1pm
Wednesday, December 9 at any time
Please let me know if any of these fit into your schedules.

Thank you,
Tabitha Roybal

From: Bill Rooney
To: "Vilma Ruth Calderon"
Cc: "Rene Clara"
Subject: information for annual regional report
Date: Sunday, November 08, 2009 10:28:00 AM

Vilma:

Can you provide with a list fo the training and extension shortcourses you've done in the past year in El Salvador?

I'm writing the annual regional report and would like to have this information in the report.

Rene, if there are others besides Vilma, can you provide that to me as well?

I need this information by Tuesday.

Thanks,

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: "John Mullet"
Cc: "Stelly_David Stelly"; [redacted] "ghodnett@ag.tamu.edu"
Subject: RE: cane, sorcane DNA for genotyping
Date: Sunday, November 08, 2009 10:25:00 AM

John:

We've selected and propagated about 35 of the best [redacted] We also have several accessions in the greenhouse as well.

Matt and George can accompany one of your folks to get tissue of both sorcane and cane. We are about to cut everything back for the winter, so we need to get the sample this week. If you could have your people get in contact with Matt and/or George, they can schedule a time to get this done.

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: John Mullet [mailto:jmullet@tamu.edu]
Sent: Sunday, November 08, 2009 9:58 AM
To: Bill Rooney; Stelly_David Stelly
Subject: cane, sorcane DNA for genotyping

Bill and David,

I would like to get a head start on the cane/sorcane DGA genotyping we have proposed as part of the DARPA project. Would it be okay if I collect some leaf tissue for DNA extraction from ~6-12 of the space plants in field 218 to get us started (I will keep track of the plant numbers in case that becomes important)?

Thanks,

John

From: Bill Rooney
To: [redacted]
Cc: [redacted]; "ghodnett@ag.tamu.edu"
Subject: RE: 12 pictures for you
Date: Sunday, November 08, 2009 9:51:00 AM

Bob and all:

Thanks for the pictures and information. We are currently waiting for funding opportunities to develop. IF they do, we will certainly be interested in exploring a collaborative relationship.

As we discussed in Indonesia, I plan to get to Hawaii sometime this winter (maybe January?) and I will definitely want to visit HARC sugarcane station. By that time, we should also know regarding our funding.

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: [redacted]
Sent: Friday, November 06, 2009 5:04 PM
To: wlr@tamu.edu; ghodnett@ag.tamu.edu
Cc: [redacted]
Subject: 12 pictures for you

Bill, George

For your information and possible future use I am enclosing some information on the Hawaii Agriculture Research Center's (HARC') 70 acre Maunawili sugarcane breeding station located on Oahu. Included at the site are the Hawaii sugarcane breeding collection, crossing shelters, greenhouses, outdoor grow out facilities,a mechanical shop and an office building (see photo of map enclosed.

Attached are some photos of the crossing facilities at the HARC Maunawili sugarcane breeding station. This is where the US collection of sugarcane will be located as it comes out of quarantine. Already present at the site is the Hawaii sugarcane collection with an extensive inventory of S. officinarum, robustum, spontaneum and commercial breeding accessions. Maunawili is considered one of the best sites in the world for sugarcane flowering.

HARC also has a modern research facility and fields at another location on Oahu at Kunia. The HARC facility at Kunia is in close proximity to seed research and parent seed operations of Pioneer, Monsanto and Sygenta. The Kunia site has high sunlight and low rainfall making it suitable for year around seed research and seed production under irrigation.

Bob

You have been sent 12 pictures.

P1019512.JPG
P1019514.JPG
P1019515.JPG
P1019517.JPG
P1019519.JPG
P1019522.JPG
P1019524.JPG
P1019525.JPG
P1019527.JPG
P1019528.JPG
P1019530.JPG
P1019531.JPG

From: Bill Rooney
To: "Shekhar Joshi"
Subject: RE: [Fwd: Re: Bioenergy Crops: Chapter Invitation]
Date: Sunday, November 08, 2009 9:23:00 AM

I talked with Rebecca - she didn't feel she had the time to finish.

I would recommend Dr. Ismail Dweikat at University of Nebraska. He has been working with sweet sorghum and may have an interest in writing for the book.

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: Shekhar Joshi [mailto:cpjoshi@mtu.edu]
Sent: Friday, November 06, 2009 2:54 PM
To: Bill Rooney
Subject: Re: [Fwd: Re: Bioenergy Crops: Chapter Invitation]

Dear Dr. Bill Rooney,

I was wondering if you discussed with your graduate student about writing the chapter on "Sweet sorghum" for our Bioenergy book? Is there any hope that you and your student could write this chapter soon?

If you are unable to do this soon, I understand. In that case, could you please suggest some names of your colleagues who might quickly help us out. This chapter is too important for us to drop it from the book.

With best wishes,

Shekhar Joshi

--
Dr. C. P. Joshi
Professor of Plant Molecular Genetics &
Director, Biotechnology Research Center
School of Forest Resources and Environmental Science
Michigan Technological University
1400 Townsend Drive
Houghton, MI 49931
Ph: 906-487-3480, Fax: 906-487-2915; Email: cpjoshi@mtu.edu
http://forest.mtu.edu/faculty/joshi/

From: Bill Rooney
To: "Miss Pamela Benton"
Subject: RE: info needed
Date: Sunday, November 08, 2009 9:09:00 AM

Very well. Send it as soon as you can.

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: Miss Pamela Benton [mailto:pamela.benton@uqconnect.edu.au]
Sent: Sunday, November 08, 2009 5:33 AM
To: Bill Rooney
Subject: RE: info needed

Hi Bill,

I'm in the middle of my passport application now, so that will be a couple of weeks. Sorry about the delay; I'll send it all through when I get it all together. Will be in touch soon.

Cheers, Pam

From: Bill Rooney [wlr@tamu.edu]
Sent: Tuesday, November 03, 2009 10:18 PM
To: Miss Pamela Benton
Subject: info needed

Pam:

I'm finally back and working on your official invitation for working with us next spring/summer.

I'm sure you've sent me this before, but I need three items before we can process and send your "official" invitation.

If you can send me a copy (pdf is best) of :

Copy of Resume
Evidence of Pre-arrival Health Insurance (a card, letter, etc.)
Copy of Passport (probably just the pertinent cover page)
Once I get that information, I'll be able to send you an official invitation as soon as next Monday.

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: "John Mullet"
Subject: RE: vPS Puerto Rico plant out
Date: Saturday, November 07, 2009 12:24:00 PM

Thanks, John

We don't have any of the so I can't help with that one. The others will get planted and we'll do our best to get crosses on that material. It may take a special trip down to make the crosses, but we won't know that until January or so.

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: John Mullet [mailto:jmullet@tamu.edu]
Sent: Saturday, November 07, 2009 9:15 AM
To: Bill Rooney
Subject: vPS Puerto Rico plant out

Hi Bill,

We reduced the number of lines for planting in PR to 14 (Table attached).

We do not have 90 seed for one promising line which I would like to try to cross. Would it be okay to provide fewer seed, or perhaps you have seed for this one in stock?

I will bring seed over first thing Monday am.

Among the vPS lines previously identified in PR planting in mid Nov to mid Dec resulted in anthesis in 100-150d (mid March?) just as a frame of reference.

John

From: Bill Rooney
To: "John Mullet"; "McCutchen, Bill"
Subject: RE: Confidential IBERS
Date: Saturday, November 07, 2009 12:00:00 PM

Nice summary and logical approach forward. I concur.

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: John Mullet [mailto:jmullet@tamu.edu]
Sent: Saturday, November 07, 2009 8:50 AM
To: McCutchen, Bill
Cc: Bill Rooney
Subject: Re: Confidential IBERS

Bill and Bill,

I think this one is pretty straight forward.

IBERS contacted Bill and me about discussing opportunities. This discussion is separate from IBERS collaboration with Ceres but there is potential for linkage at some point that we should keep open. It seems unlikely that any collaboration will involve Weslaco scientists or that location. However, if involvement of any REC or other unit became important, then the unit head and scientists would be brought into the discussion.

Weslaco's ongoing research with Mendel on miscanthus could significantly inhibit the IBERS/sorghum group discussion.

Apparently IBERS separately contacted Mike about cane X miscanthus opportunities. This is good and allows a separate research discussion involving cane/miscanthus and IBERS/Weslaco. This sounds like a good opportunity for our cane research group.

So the IBERS discussion has three tracks;
- IBERS/Ceres (funded project)

You and Bob Avant are in the loop in both IBERS discussions (I will ask Bob if he can have Michelle, Adam or Shay sit in on our discussion). If either IBERS engagement develops to the point of a formal proposal, then synergies with other groups/proposals should be explored.

Remember, there are no funds associated with this opportunity, only access to germplasm and collaboration.

I would recommend and will schedule an hour wrap up meeting between

you/Bob and Iain Donnelson (IBERS lead) following our morning research discussion. This way if IP and larger project issues, etc. need to be addressed, this can be done right after the meeting.

I plan to ask Bob if we can use his conference room to make this convenient. If we can schedule lunch, then you/Bob can talk to Iain during this time.

Let me know what you think about this approach.

Thanks,

John

From: Bill Rooney
To: [redacted]
Subject: FW: Position Announcement - Oak Ridge National Laboratory
Date: Friday, November 06, 2009 5:19:00 PM

FYI - this might be something you are interested in pursuing.

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: Wullschleger, Stan D. [mailto:wullschlegsd@ornl.gov]
Sent: Friday, November 06, 2009 3:38 PM
To: wlr@tamu.edu; [redacted] Jeff Bennetzen; esb33@cornell.edu; paterson@uga.edu
Cc: Wullschleger, Stan D.
Subject: Position Announcement - Oak Ridge National Laboratory

Gentlemen,

Oak Ridge National Laboratory (ORNL) has a position posted for the following: Plant Scientist - Bioenergy

"The ideal candidate will have a demonstrated background in bioenergy crop research including, but not limited to, developmental biology and biotic and abiotic stress tolerance studies of energycane, sorghum, or other relevant monocots. Research conducted under highly-controlled laboratory conditions, field conditions, or in natural plant populations is all appropriate to the overarching goals of our programs. It is critical that the candidate is willing to pursue studies that use genetics and genomics to enable hypothesis-driven research."

To apply, visit the ORNL Jobs web site (http://jobs.ornl.gov/)
Click on "View Open Positions"
Enter Keyword "Bioenergy"
Click on "Plant Scientist - Bioenergy"
Follow instructions for uploading CV and statement of research interest

Please pass this along to interested students, post-docs, colleagues, and associates.

Thanks,

Stan Wullschleger, PhD
Environmental Sciences Division
Oak Ridge National Laboratory
Oak Ridge, TN 37831-6422
Tel (865) 574-7839
Fax (865) 576-9939
Email: wullschlegsd@ornl.gov
Website: http://www.esd.ornl.gov/PGG/

From: Bill Rooney
To: "Hurley, Janie C."
Subject: RE: sorry can"t make it
Date: Friday, November 06, 2009 5:11:00 PM

Monday at 1 pm will work for me. I put it on my calendar.

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: Hurley, Janie C. [mailto:JHurley@tamu.edu]
Sent: Friday, November 06, 2009 4:03 PM
To: Bill Rooney
Cc: Brummett, Robert G.
Subject: RE: sorry can't make it

Dr. Rooney,

Robert and I have time Mon afternoon 1 – 3, but I'm completely book Mon morning. We are both headed out of town Tues afternoon and won't be back in until Thurs of next week. With this, just let us know when to shoot for next.

Thanks!
Janie

Janie C. Hurley, MBA
Sr. Licensing Manager

Office of Technology Commercialization
The Texas A&M University System
3369 TAMU
College Station, TX 77843-3369
Ph: 979-845-6337
Fx: 979-845-1402
http://otc.tamu.edu

From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Friday, November 06, 2009 3:57 PM
To: Hurley, Janie C.

Subject: sorry can't make it

Janie:

I'm sorry but I have to cancel. Nilesh (my postdoc) had scheduled another meeting at 4:00 pm that I have to be at.

How about Monday morning? I'm open most of the day.

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: "Lee, DoKyoung"
Subject: RE: invited seminar
Date: Friday, November 06, 2009 5:10:00 PM

DK:

Integrated Breeding Approaches to Improve Sorghum as a Feed, Food and Fuel Crop

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: Lee, DoKyoung [mailto:leedk@illinois.edu]
Sent: Friday, November 06, 2009 4:51 PM
To: Bill Rooney
Subject: RE: invited seminar

Bill,

If you send me your title during the weekend I will start advertising.
Have a nice weekend,

D.k=K.

From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Thursday, November 05, 2009 3:06 PM
To: Lee, DoKyoung
Subject: RE: invited seminar

DK – see title below.

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: Lee, DoKyoung [mailto:leedk@illinois.edu]
Sent: Tuesday, November 03, 2009 9:52 PM
To: Bill Rooney
Subject: RE: invited seminar

Bill,

I will be back to school on Thursday and I will arrange your hotel.
Please save all of your receipts and i will turn into the department.

I guess your research related with sorghum breeding and production will be great for your presentation. If you give me a title I will start advertising and people will contact me to meet you. I will show you our energy farm and sorghum trial on Thursday.

Thanks,

D.K.

From: Bill Rooney [wlr@tamu.edu]
Sent: Tuesday, November 03, 2009 1:31 PM
To: Lee, DoKyoung
Subject: RE: invited seminar

DK:

I'm scheduled to arrive Wednesday evening at 8:50pm on AA3418. I've allocated all of Thursday to spend on campus. I'm open to visit with anybody you see fit during the day.

On Friday morning, I've been asked to meet with Chromatin, a company based in Chicago who will come down to Champaign for the morning. Bottom line, you don't have to worry about me on Friday.

Once you get a schedule together for Thursday, just let me know. Also, what topics do you want coverage of? Anything specific?

I'll cover my plane ticket. If you can cover the hotel, that'll be fine with me. I don't really care which hotel – just let me know.

Regards,

Bill

11NOV - WEDNESDAY
LV COLLEGE STATION 3:55 PM 3387 American Airlines
AR DALLAS FT WORTH 4:50 PM ECONOMY
OPERATED BY AMERICAN EAGLE Food For Purchase
WILLIAM ROONEY SEAT 10A FREQUENT FLYER:75YJ910

11NOV - WEDNESDAY
LV DALLAS FT WORTH 6:50 PM 3418 American Airlines
AR CHAMPAIGN 8:50 PM ECONOMY
OPERATED BY AMERICAN EAGLE Food For Purchase
WILLIAM ROONEY SEAT 11C FREQUENT FLYER:75YJ910

13NOV - FRIDAY
LV CHAMPAIGN 12:40 PM 4052 American Airlines
AR CHICAGO OHARE 1:35 PM ECONOMY
OPERATED BY AMERICAN EAGLE Food For Purchase
WILLIAM ROONEY SEAT 16C FREQUENT FLYER:75YJ910

13NOV - FRIDAY
LV CHICAGO OHARE 3:25 PM 2335 American Airlines
AR DALLAS FT WORTH 5:50 PM ECONOMY
Food For Purchase
WILLIAM ROONEY SEAT 30E FREQUENT FLYER:75YJ910

13NOV - FRIDAY
LV DALLAS FT WORTH 8:35 PM 3498 American Airlines
AR COLLEGE STATION 9:25 PM ECONOMY
OPERATED BY AMERICAN EAGLE Food For Purchase
WILLIAM ROONEY SEAT 14C FREQUENT FLYER:75YJ910

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: DoKyoung Lee [mailto:leedk@illinois.edu]
Sent: Thursday, October 29, 2009 1:59 PM
To: 'Bill Rooney'
Subject: invited seminar

Dear Bill,

I hope you remember the seminar for our department scheduled on November 12.
If you arrange your travel we will reimburse later. I will arrange a hotel if you don't have any preference. Also It will be nice to have your title sometime next week.
I am wondering if you go to ASA meeting. I will be there.
Thanks,

D.K.

_____

DoKyoung "D.K." Lee
Assistant Professor of Biomass and Bioenergy Crop Production
Department of Crop Sciences, University of Illinois
S-320 Turner Hall, MC-046
1102 South Goodwin Avenue
Urbana, Illinois 61801
217-333-7736/Fax: 217-333-5299

From: Bill Rooney
To: "Hurley, Janie C."
Subject: sorry can"t make it
Date: Friday, November 06, 2009 3:57:00 PM

Janie:

I'm sorry but I have to cancel. Nilesh (my postdoc) had scheduled another meeting at 4:00 pm that I have to be at.

How about Monday morning? I'm open most of the day.

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: "James Osborne"
Subject: one more request
Date: Friday, November 06, 2009 3:05:00 PM

Jim:

I know I just asked for 100 rows, well I'm asking for another 100 rows. That would bring my total to 500 and I promise it will not go higher. If there is a problem, 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

From: Bill Rooney
To: "Lea Dell Morris"
Subject: travel request and airline reservation
Date: Friday, November 06, 2009 10:38:00 AM

Lea Dell

I need another T&L Request

November 30 – December 5: To Managua, Nicaragua and San Salvador, El Salvador.

Meet with INTA and CENTA cooperators working on the INTSORMIL Central American Sorghum Research Program.

I also need a airline reservation on Continental Airlines, frequent flyer PW736685 William L Rooney

11/30/09 CO1774
12/05/09 CO829

Should be about $500.00. This will be paid from my INTSORMIL account at the RF.

Thanks and 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: "James Osborne"
Subject: more rows?
Date: Friday, November 06, 2009 8:55:00 AM

Jim:

Can I get an extra four rows? That would be 100 extra plots and would increase my numbers to 400 plots total.

I'm going to assume that we can get those, unless you tell me otherwise.

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: [redacted] "Jeffrey N Wilson"; [redacted]
Subject: FW: DOE Fellowship announcement draft
Date: Friday, November 06, 2009 7:16:00 AM

You can check this out and see if you are interested in competing, but it is really nice money…..

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: Reed, David W [mailto:dwreed@tamu.edu]
Sent: Sunday, November 01, 2009 2:53 PM
To: Nichols, John P; jelliot@aged.tamu.edu; Acuff, Gary R.; Reinhart, Gregory; Riskowski, Gerald; Whisenant, Steven; kmheinz@neo.tamu.edu; t-davis@tamu.edu; j-keeton@tamu.edu; Gross, Dennis; jcarey@poultry.tamu.edu; Ellis, Gary; dbaltensperger@tamu.edu; telacher@ag.tamu.edu; d-leatham@tamu.edu; tmurphy@tamu.edu; Forrest, David W.; wdpark@tamu.edu; rmoreira@tamu.edu; j-gan@tamu.edu; m-eubanks@tamu.edu; d-byrne@tamu.edu; Upton, Melanie; c-kenerley@tamu.edu; caldwell@poultry.tamu.edu; jpetrick@tamu.edu; Smith, Wayne; d-gatlin@tamu.edu; Jones, Eluned; spillai@poultry.tamu.edu; c-coates@tamu.edu; j-keeton@tamu.edu; gould@tamu.edu; Smith, Stephen
Cc: jbowman@tamu.edu; Sams, Alan
Subject: FW: DOE Fellowship announcement draft

Heads and Associate Heads for Graduate Programs:
Please distribute to your graduate faculty and graduate students. If any are interested in preparing an application, please ask them to contact me. If needed, Dr. Bowman is willing to me with those interested and give her insights into preparing an effective application.
Dave

From: Jean Ann Bowman [mailto:jbowman@tamu.edu]
Sent: Friday, October 30, 2009 3:08 PM
To: Reed, David W
Subject: DOE Fellowship announcement draft

Graduate Students: Are you interested in a $50,000/year graduate fellowship?

If you meet these requirements, you may be eligible to apply for a new DOE Fellowship program:

- U.S. citizen
- Full-time undergraduate or first/second year graduate in physics, chemistry, biology, mathematics, engineering, environmental sciences, or computer sciences
- If an undergraduate, you will complete a B.S. in those fields by July 31, 2010
- Have undergraduate grade point average of 3.3 or higher
- Are pursuing a Masters or PhD in the above fields

Applications are due November 30, 2009.
DOE expects to make 80 awards this year.
Students must write their own applications and they will receive the funding directly.

Follow this link for more information:
http://www.scied.science.doe.gov/SCGF/eligibility.html

Jean Ann Bowman, Ph.D.
Office of Proposal Development
Division of Research and Graduate Studies
and
Department of Geography
College of Geosciences

979.458.1140

http://opd.tamu.edu

From: Bill Rooney
To: [redacted]
Subject: RE: FW: Visit of Geraldo Eugenio Franca - Embrapa
Date: Friday, November 06, 2009 7:12:00 AM

Geraldo:

Looks like a nice schedule and you'll get to attend the football game. Nice!

I'll be at the game, but I work at the concession stand with my son. It is the 4-H clubs fund raising program.

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: Geraldo Eugenio [redacted]
Sent: Friday, November 06, 2009 2:58 AM
To: malves@ipomail.tamu.edu; wlr@tamu.edu; lrooney@ag.tamu.edu
Cc: rnorton@ipomail.tamu.edu; Ebishop@ipomail.tamu.edu
Subject: Re: FW: Visit of Geraldo Eugenio Franca - Embrapa

Dear Dr. Rooney, Dr. Bill,

I am forwarding the message sent from Mrs. Maria Alves on a proprosed schedule for my trip to College Station. Is that fine with you? Are you planning to go to the game?

Yours.

Geraldo Eugenio

On Qui 05/11/09 20:21 , "Alves, Maria" malves@ipomail.tamu.edu sent:
Estimado Geraldo Eugenio,

Espero que a sua viagem a Havana tenha sido produtiva.
Abaixo esta uma proposta de agenda que preparamos tomando em consideração o seu email.

Espero que você possa marcar a sua chegada a College Station na sexta a noite. Se isso for possível, nos gostaríamos de convidá-lo para assistir o jogo de football americano entre a Texas A&M e a Baylor que será no sábado as 2:30pm. Gostaríamos também de convidá-lo para o almoço oferecido

pelo presidente da universidade antes do jogo.

Aguardo a sua confirmação.
Obrigada,
Maria

PROPOSED AGENDA
Saturday – November 21, 2009

8:30 am **Breakfast meeting with Maria Alves and Roger Norton**
Location: TBC

10:00 am **Meeting with Brazilian Students**
Location: TBC

12:00 pm **Presidential Buffet**
Location: Kyle Field

2:30 pm **Football Game: Texas A&M x Baylor**
Location: Kyle Field

Sunday – November 22, 2009
Off

Monday – November 23, 2009

9:00 am **Meeting with Dr. Sam Feagley and Dr. David Zuberer**
Location: room 437, Heep Center

10:30 am **Courtesy visit with Ms. Violetta Cook**
Location: 351 Bizzell Hall West

11:45 am **Lunch with Dr. Eleanor Green, Dean of the College of Veterinary Medicine; and Dr. Roger Norton, Executive Director of the Office for Latin American Programs (TBC)**
Location: University Club

2:00 pm **Meeting with Dr. Mark Hussey; Dr. Alan Sams, Executive Associate Dean for the College of Agriculture and Life Sciences; and Dr. Roger Norton, Executive Director of the Office for Latin American Programs**
Location: Dr. Hussey's office, 113 Administration Bldg

3:30 pm **Meeting with Dr. Bill Rooney and Dr. Lloyd Rooney**
Location: 204C Coke Bldg

Maria Alves
Program Manager for South America, Office for Latin America Programs

Texas A&M University

204 Coke Building | 4251 TAMU
College Station, TX 77843-4251 | USA
Tel. +1 979.845.3367 | Fax. +1 979.845.6228
Email: malves@tamu.edu | Web http://olap.tamu.edu

Welcome to Aggieland

From: Bill Rooney
To: "Pam Wilhelm"
Subject: RE: account
Date: Thursday, November 05, 2009 5:57:00 PM

Those are mine, add them as they are budgeted and we'll use them.

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, October 05, 2009 3:45 PM
To: Bill L Rooney
Subject: account

Dr. Rooney, this is Oklahoma State University account. There is money in the base account that has not been moved. I need to know where it goes? To you or someone else. There is $4643 in travel, $8350 in supplies

From: Bill Rooney
To: "Pam Wilhelm"; "Carolyn Engledow"
Cc: "Carol Rhodes"; "Lloyd Rooney"
Subject: RE: new account United Sorghum Checkoff Program
Date: Thursday, November 05, 2009 5:24:00 PM

I'm guessing that this number is for Lloyd Rooney. The account numbers matched the budget that I had submitted and I only had this project funded.

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 10:50 AM
To: Carolyn Engledow
Cc: Carol Rhodes; Lloyd Rooney; Bill L Rooney
Subject: new account United Sorghum Checkoff Program

Hello Carolyn,

This new account showed up for Dr. Rooney. You have Bill Rooney's name on it but Lloyd Rooney's project number on it. Whose is it?

From: Bill Rooney
To: "Pam Wilhelm"
Subject: RE: new account
Date: Thursday, November 05, 2009 5:23:00 PM

This is my account, the budget numbers match with the budget in the proposal.

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 10:43 AM
To: Bill L Rooney
Cc: Sonnie Feagley
Subject: new account

Good Morning,

I found a new account for you when I was reconciling. is the United Sorghum Checkoff Program Bd. There is $29347 in salaries, $1000 in travel and $5000 in supplies.

Pamela K. Wilhelm
Business Coordinator II
Soil & Crop Sciences
Texas A&M University
2474 TAMUS
College Station, TX 77843-2474
979/862-1023
FAX 979/845-0456
pwilhelm@ag.tamu.edu

From: Bill Rooney
To: "Ma. Liliana Flores López"
Subject: RE: Dr. William Rooney
Date: Thursday, November 05, 2009 5:05:00 PM

Liliana:

I do advise graduate students for both Ph.D. and M.S. degrees, primarily in the area of Plant Breeding and Genetics.

If you have an interest in that area, please send me your resume and I can provide you with an assessment of opportunities.

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: Ma. Liliana Flores López [redacted]
Sent: Wednesday, November 04, 2009 11:24 AM
To: wlr@tamu.edu
Subject: Dr. William Rooney

Dr. Rooney,

Hello! I'm Liliana Flores, from Coahuila, Mexico. Dr. Raul Rodriguez gave me your e-mail address, and told me that you're working in the cereal area. I'm Master in Science, and now I'm working in a Research center in the microbiology and molecular biology. I'm work about plants and meanly with phytophatogens.

Are you able to accept students for PhD?

Please to contact me, and I would be thanked for your answer.

Sincerely,

Liliana Flores

From: Bill Rooney
To: "Lloyd Rooney"
Subject: FW: Sorghum Bran Tannin Antioxidants in Ground Beef
Date: Thursday, November 05, 2009 4:20:00 PM

I assume this is for you. If not just let me know.

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: tlchandler@neo.tamu.edu [mailto:tlchandler@neo.tamu.edu]
Sent: Thursday, November 05, 2009 4:04 PM
To: wlr@tamu.edu; jawika@ag.tamu.edu
Cc: rmiller
Subject: Sorghum Bran Tannin Antioxidants in Ground Beef

Dear Dr. Rooney and Dr. Awika,

My name is [redacted] and I am a graduate student under Dr. Rhonda K. Miller. My research will be an extension of the work that Shannon Bennett has been doing with natural tannin sources as added antioxidants in ground beef. Dr. Miller would like me to work with different sorghum bran as tannin sources. I am planning to start some preliminary work at the first of the year, and hoping to begin my project sometime around late January if possible. I would like to set up a meeting with the two of you to gain a better understanding of which sorghum brans I should consider including in my proposal, as well as recommended treatment levels. A few dates/times that work well for me include:
Thursday, November 19 after 1pm
Tuesday, December 8 after 1pm
Wednesday, December 9 at any time
Please let me know if any of these fit into your schedules.

Thank you,
[redacted]

From: Bill Rooney
To: "Jeff Dahlberg"
Subject: RE: Electronic copy of proposal
Date: Thursday, November 05, 2009 3:01:00 PM

Jeff:

I apologize for stringing you guys out, but I'm not going to be able to put together an acceptable proposal on short time. I wanted to get a group together and have something that was comprehensive and useful across state lines, but my schedule has simply not allowed me to get that done. Rather than write something that isn't very good, I'd rather wait and put a good proposal together at the next opportunity.

Again, I'm sorry for dragging you out on this one. I really thought I could get it done, but it ain't happening fast enough.

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: Jeff Dahlberg [redacted]
Sent: Wednesday, November 04, 2009 9:08 AM
To: Bill Rooney
Subject: Electronic copy of proposal

Bill:

Can you send me the electronic copy as a word file of the proposal your going to submit? If I could get that a bit earlier than when you send the hard copies, I can send thing out to reviewers earlier.

Thanks,

Jeff

Dr. Jeff Dahlberg
USCP
4201 N. Interstate 27
Lubbock, TX 79403
Office: 806-687-8727
Cell: 806-438-8501
E-mail [redacted]

From: Bill Rooney
To: "Ken Davenport"
Subject: RE: Chromatin Visit
Date: Thursday, November 05, 2009 2:57:00 PM

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: Ken Davenport [redacted]
Sent: Wednesday, November 04, 2009 7:36 AM
To: Bill Rooney
Subject: RE: Chromatin Visit

Bill,

If you could present what you covered with Larry and me when we visited in September, this would be fine. I think we would also be interesed your perspective as to the challenges and opportunities as they pertain to improving sorghum yields and quality as a bioenergy feedstock. I am thinking of the presentation you made at the sorghum improvement conference in Amarillo a couple of months ago.

I have to follow-up with Janie Hurley regarding the non-disclosure agreement that we are trying to put in place between AgriLife and Chromatin. I understand from Larry that he is working with you, Bill and Gary to access some of your germplasm. Presumably, this is proceeding well. I will likely give Bob Avant a call as well with regard to the MTA and terms.

Lambright, Rounsley and I will drive down on Thursday evening and will plan to meet you at your hotel at 7:30 a.m. for breakfast and then we will all head over to the Research Park. I do not believe I have your mobile phone number. If you would provide it to me, I will be able to contact you if need be.

See you next Friday

Kenneth G. Davenport, Ph. D.
Strategic Development
Chromatin Inc.
3440 S. Dearborn St., Suite 280
Chicago, IL 60616

+1.312.235.3619 (O)
+1.312.235.3611 (F)
+1.214.215.2984 (M)

From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Tue 11/3/2009 2:38 PM
To: Ken Davenport

Subject: RE: Chromatin Visit

Ken:

I'll be occupied with U Illinois through Thursday evening, but Friday morning is allocated to visiting with Chromatin. I'll be available from 7 am through airport departure. Breakfast is fine, just let me know. As soon as I know accommodations, I'll let you know (U Illinois is making those arrangements).

What do you want in the seminar – like what you saw here at TAMU?

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: Ken Davenport [redacted]
Sent: Tuesday, November 03, 2009 1:06 PM
To: Bill Rooney
Cc: Daphne Preuss; Shawn Carlson; [redacted] rounsley@email.arizona.edu; Song Luo; Jeff Scheib; Greg Zinkl; Brad Schwartz
Subject: RE: Chromatin Visit

Bill,

Thanks much for this information. Let's plan on beginning at 9:00 a.m. at the Enterprise Works Building 60 Enterprise Drive. This location is the Research Park at the University of Illinois where we are based in Champaine. We will be either driving down Thursday evening (12th) or that Friday morning (13th). Would you be available for breakfast that Friday morning? If so, some of us would arrange to have breakfast with you if you wish.

I have copied Shawn Carlson who leads the science team in Champaign and will serve as the host for the meeting. We would begin with a seminar presentation by you, followed by a brief tour of our facilities and discussion. We will arrange for your transportation to the airport. In all probability, Larry, Steve and I will take the same flight from CMI since we will be heading on to our respective destinations.

We look forward to meeting with you next Friday.

Best regards,

Ken

Kenneth G. Davenport, Ph. D.
Strategic Development
Chromatin Inc.

3440 S. Dearborn St., Suite 280
Chicago, IL 60616

+1.312.235.3619 (O)
+1.312.235.3611 (F)
+1.214.215.2984 (M)

From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Tue 11/3/2009 12:53 PM
To: Ken Davenport
Subject: RE: Chromatin Visit

Ken

I'm scheduled to depart Champaign at 12:40 pm on AA4052

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: Ken Davenport [redacted]
Sent: Monday, November 02, 2009 8:10 PM
To: wlr@tamu.edu
Subject: Chromatin Visit

Bill, we are beginning to make arrangements for your visit next Friday, 13 November. Because I am arranging for Larry Lambright to fly in from Lubbock and our folks to drive down from Chicago, knowing your departure time that Friday would facilitate planning. Steve Rounsley (U AZ) bioinformaticist will be with us in Chicago and drive down with us for your seminar. Please advise at your earliest opportunity or feel free to give me a call (214,.215.2984) tomorrow if you wish. . Thanks, Ken

From: Bill Rooney
To: "Patricia Klein"
Subject: RE: Tx3361 by kandy korn
Date: Thursday, November 05, 2009 2:04:00 PM

That is correct; treat each plant as a separate entry.

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: Patricia Klein [mailto:pklein@tamu.edu]
Sent: Thursday, November 05, 2009 1:58 PM
To: Bill Rooney
Subject: RE: Tx3361 by kandy korn

Bill

If I understand correctly, the seed of that Matt gave us should be not be bulked. Thus we germinate 5-10 seeds, extract DNA separately from each one and then run the corn markers through these 5-10 samples. Please confirm if I am correct.

Thanks
Trish

At 01:46 PM 11/5/2009, you wrote:
>Trish:
>
>I expect that you've got hybrid corn, and seed derived
>from the cross of Each seed would be different if
>is actually present (which is not all that likely give what we see in the
>greenhouse). Matt correct me if this is wrong.
>
>I expect if you can run five different plants of the that
>would suffice and prove our point either way.
>
>Make sense? If not, 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: Patricia Klein [mailto:pklein@tamu.edu]
>Sent: Thursday, November 05, 2009 11:44 AM
>To: Bill Rooney
>Subject:
>
>Bill
>
>I am a bit confused on the work that you asked
>Natalie to do. Matt dropped off seed of the following:

>
>Thus he gave us three envelopes. My question is was there only one
>cross of that you wanted us to check or is he sending us
>bulked seed from several crosses? Before I have Natalie do anything
>I want to know what we have. She and Matt both seemed a bit confused
>and I wasn't there to hear the conversation.
>
>Thanks
>Trish
>
>
>
>
>
>
>
>
>Dr. Patricia Klein
>Associate Professor
>Institute for Plant Genomics and Biotechnology
>TAMU 2123
>Texas AgriLIFE Research
>Texas A&M University
>College Station, TX 77843-2123
>
>phone: 979-862-6308
>fax: 979-862-4790

Dr. Patricia Klein
Associate Professor
Institute for Plant Genomics and Biotechnology
TAMU 2123
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Texas A&M University
College Station, TX 77843-2123

phone: 979-862-6308
fax: 979-862-4790

From: Bill Rooney
To: "Sharon Mitchell"
Cc: "Stephen Kresovich"
Subject: RE: Hybrid A-lines
Date: Thursday, November 05, 2009 2:03:00 PM

Sharon:

We can make that single cross female without much trouble, but I wouldn't make it in Puerto Rico. ATx642 doesn't do too well in PR; and since you won't be using the single cross until the next winter, I would simply make that seed in CS in the summer and then it would be available next fall for the next winter nursery.

That is somewhat of a unique single cross; most seed companies don't bother with it because 642 is a pretty low seed yielder and they don't use it for forage. That's why they don't have it.

We have the parental lines, but I would recommend ATx642 per se in PR for the reasons listed previously. ATx2752 is okay but it is hard to get a lot of seed out of it in a crossing block because it has a small head and isn't great on seed set under a bag. But if you want seed of both let me know; I can send it directly to jim.

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: Sharon Mitchell [mailto:sem30@cornell.edu]
Sent: Wednesday, November 04, 2009 1:50 PM
To: Bill Rooney
Cc: Stephen Kresovich
Subject: Hybrid A-lines

Hi Bill,
Steve and I have been talking of the best strategy for resynthesizing one of your hybrid A-lines, specifically A.Tx642/BTx2752. What is your recommendation for the most efficient way for us to do this? Resynthesize the lines at Crosbyton this winter, pay you or another seed company to resynthesize the line for us? Other alternative? If we plant the lines in Puerto Rico this winter, we'd need ~ 1800 seeds from each parental line. Do you have these seed on hand? Could we get the seed from you or another source?

Thanks for your advice,
Sharon

Sharon E. Mitchell, Ph.D.
Manager, Institute for Genomic Diversity Laboratories
Biotechnology Building, Room 151
Cornell University
Ithaca, NY 14853-2703
sem30@cornell.edu

Ph: (607) 254-4851
FAX: (607) 254-6379

From: Bill Rooney
To: "Ostilio Portillo"
Subject: RE: Greetings from Honduras.
Date: Thursday, November 05, 2009 1:56:00 PM

Ostilio:

See responses for each question directly below each question.

FYI, I know it is not close to you, but I'll be in Choulteca in the first week of December.

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

1. I understand that I have to send electronically to Mrs. Kurten the Applicant Record Check form; however, can I also sing and simply scan the assistantship offer and send it to you via e-mail as well or you actually need the hard copy which I can send via courier?

Sign and send it via e-mail. That is acceptable. You can bring a hard copy with you when you arrive.

2. I was informed by the Office of Admissions and Records that I was accepted as non-resident; will this be a problem later on in terms of payments? I recall that during my MS term Mrs. Cook from the International Student Services (ISS) changed my status so I became a resident to reduce tuition costs.

With the assistantship, you will be granted resident tuition; since we are paying that anyway, it really doesn't affect you at all.

3. I as mentioned before, I am currently working for FHIA since June last year which means, according to Honduras' laws, I have to turn in my resignation to my direct supervisor (Dr. Donald Breazeale) two months before my departure. Should I proceed now or you think I should wait till the whole process is confirmed with the Monsanto's assistantship?

The process is already confirmed. I have an assistantship for you (not Monsanto).

If the Monsanto application works, then that is just additional funds for you (and less that I have to pay). But either way, we are ready for you to arrive in January (or whenever is acceptable to you in the spring). So make your plans accordingly. The spring semester begins January 19.

From: Bill Rooney
To: "Patricia Klein"
Cc: [redacted]
Subject: RE:
Date: Thursday, November 05, 2009 1:45:00 PM

Trish:

I expect that you've got and seed derived from the cross of Each seed would be different if is actually present (which is not all that likely give what we see in the greenhouse). Matt correct me if this is wrong.

I expect if you can run five different plants of the that would suffice and prove our point either way.

Make sense? If not, 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: Patricia Klein [mailto:pklein@tamu.edu]
Sent: Thursday, November 05, 2009 11:44 AM
To: Bill Rooney
Subject:

Bill

I am a bit confused on the work that you asked Natalie to do. Matt dropped off seed of the following:

Thus he gave us three envelopes. My question is was there only one cross of that you wanted us to check or is he sending us bulked seed from several crosses? Before I have Natalie do anything I want to know what we have. She and Matt both seemed a bit confused and I wasn't there to hear the conversation.

Thanks
Trish

Dr. Patricia Klein
Associate Professor
Institute for Plant Genomics and Biotechnology
TAMU 2123
Texas AgriLIFE Research
Texas A&M University
College Station, TX 77843-2123

phone: 979-862-6308
fax: 979-862-4790

From: Bill Rooney
To: "sympa@groups.tamu.edu"
Subject: DISTRIBUTE cs-scsc642600-fall2009 4b26109cec3341ed2464faf71b07520b
Date: Thursday, November 05, 2009 9:14:00 AM

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: "sympa@groups.tamu.edu"
Subject: DISTRIBUTE cs-scsc642600-fall2009 1d10bcf1b588b2bdad6b0688d3f91f4c
Date: Thursday, November 05, 2009 7:20:00 AM

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: "sympa@groups.tamu.edu"
Subject: REJECT cs-scsc642600-fall2009 c501428de6dd5a680c12ccc5332e4ad5
Date: Thursday, November 05, 2009 7:03:00 AM

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: "sympa@groups.tamu.edu"
Subject: DISTRIBUTE cs-scsc642600-fall2009 0464d2953d3414458c083b9c97acc0ad
Date: Thursday, November 05, 2009 7:03:00 AM

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: "Stefaniak, Thomas R"
Subject: RE:
Date: Thursday, November 05, 2009 6:40:00 AM

Thomas:

It should be posted by the end of this week. If you search for Great Jobs and TAMU or Texas Agrilife you should be able to find it. If not , let me know and I'll look up the exact spot. You'll apply at the same website.

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: Stefaniak, Thomas R [mailto:trstef1@uky.edu]
Sent: Wednesday, November 04, 2009 7:15 PM
To: 'Bill Rooney'
Subject: RE:

Bill
I am not sure what site I should use to search for your post-doc position. I have not yet found it at the TAMU or Texas AgriLife sites. I assume the hiring department is Soil and Crop Science; but if or when you know the N.O.V. position number I would be grateful if you emailed it to me. Again, I hope I am not being a nuisance. I very much do not want to miss this opportunity
Regards

Thomas R. Stefaniak Ph.D.
Plant and Soil Sciences Department
College of Agriculture
1405 Veterans Drive
322 Plant and Soil Sciences Building
Lexington, KY 40546-0312
Office: 859-257-5020 ext. 80295
Fax: 859-257-7125
email: trstef1@uky.edu

-----Original Message-----
From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Wednesday, October 21, 2009 10:01 PM
To: Stefaniak, Thomas R
Subject: RE:

Thomas

Send both samples. We don't need 2-3 kg; just make sure we'll have at least 500 g of dry material.

As for the post doc, I will be posting that position once I return to Texas on November 1.

Thanks for asking, regards,

Bill

-----Original Message-----
From: Stefaniak, Thomas R [mailto:trstef1@uky.edu]
Sent: Wednesday, October 21, 2009 11:33 AM
To: wlr@tamu.edu
Subject:

Bill
I am hoping you can give me some advice concerning harvesting sorghum from the DOE trial after a frost here in KY. I have already measured yield components and taken grab samples for all the plots. For the Graze-all and Graze-n-Bale plots I took two grab samples; one when we made the first cut, and one a week ago.
I am planning on harvesting the final total biomass from all plots tomorrow 10-22. Unfortunately we had a hard frost last Sunday. The mostly dead plants obviously have less moisture content than they did when I collected the grab samples. Consequently I think I need to sample them again so I can more accurately adjust the weight to dry yield. My question to you is should I also send you those post harvest grab samples as well? I am glad to do it but do not want to overwhelm your people with samples (8 from the first cut, 24 from last weeks sample date , and 24 post frost). Another question is that last year I sent you very large samples (like 2 or 3 kgs). Can I send less?
If this email is hard to follow you can call me on my cell at 859-489-3553.
Also, is there any more news about your post-doc?
Respectfully
Thomas R. Stefaniak

From: Bill Rooney
To: "Kerry Mayfield"
Subject: exam
Date: Friday, November 06, 2009 8:08:00 AM
Attachments: Mayfield Preliminary Exam WLR.doc

Here it is. Have fun. You can type it and send it back or write it and put it on my desk.

Good luck.
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

Written Preliminary Exam
for Kerry Mayfield

Friday, November 06, 2009

Closed Book
E-mail to me by 6:00 pm

Please respond to each question using well written sentences and/or paragraphs that indicate you can write the English language effectively. As diagrams are needed, please include them as well. You have all day, so I expect legible and clear answers.

1. In your sorghum breeding program, anthracnose resistance is an absolutely critical trait and you have identified two sources of absolute resistance (both are resistant to all pathotypes in your possession). You need to know whether these sources have the same or different resistance genes. Describe the experiment and expected results dependent on whether the resistance is the same gene or different genes.

2. Write a succinct (1 page max) but descriptive case to justify funding for interspecific/ intergeneric hybridization for crop improvement. This is not crop dependent and must describe why this work is important.

3. Due to political mandates that dictate we will not use "food" crops for biofuel, the fledgling biofuel industry is grasping for alternative plant species as sources of biomass for biofuel conversion. Worldwide five prominently mentioned species are tropical sugarbeets, switchgrass, camelina, miscanthus and algae. None of these crops have much commercial production but all have been widely publicized as the answer to our biomass production problems.
    a. What is your opinion of the political mandate that NOT use food crops as fuel sources?
    b. For the five species listed, how will it be used for biofuel production (ie, oil, lignocelluosic, starch, etc.).
    c. Of the five, which would you recommend for investment and development to someone interested in commercial sales of a crop. Explain why.

4. How do commercial companies integrate the transgenic and traditional breeding approaches?

5. ALS and ACCase herbicide tolerance is being promoted for the sorghum industry.
    a. How was ALS herbicide resistance transferred to grain sorghum?
    b. Should agriculturists/agronomists have any concerns regarding ALS herbicide resistance in sorghum?
    c. What should be the concern of the sorghum industry pertaining to the transfer of this trait to sorghum?

6. Tell me about heritability. Include in the discussion the types, how they are measured (with examples) and how they are used. In the discussion, please explain how heritability estimate can be highly variable.

7. On which continent were MOST of our major crops (and animals) domesticated? Can you provide me with a logical reason as to why most of our domesticated plants (and for that matter, animals) came from this single continent?

8. Do you think it possible to develop a corn that is immune to aflatoxin? If so, how will that be accomplished?

From: Bill Rooney
To: "Delroy Collins"; "dustin borden"
Subject: final nursery
Date: Saturday, November 07, 2009 12:26:00 PM
Attachments: 10 PR Winter Nursery.xls

Here's the final PR nursery. The only group that needs to be printed are the 2401-2500 (rows 17-20).

John Mullet will bring seed of fourteen sources on Monday morning. The sources are listed as USDA and we'll have to match source with pedigree.

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
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College Station, Texas 77843-2474
979 845 2151

From: Bill Rooney
To: "David Bransby"
Subject: four pages of sorghum
Date: Thursday, November 12, 2009 10:14:00 PM
Attachments: Sorghum for Grass Book Chapter.docx

David:

I'm a week late but better late than never. Attached is a rough draft, I still need to provide the references, but I'll do that this weekend (and I may tweak the writing).

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: [redacted]
Subject: FW: Sorghum Template
Date: Thursday, November 05, 2009 5:13:00 PM
Attachments: Sorghum Data Template070809.xls

[redacted]

Chris has sent a data template for this year's RBFT data. Hopefully each location will submit their data on this form, but if not we need to make sure that we ask them for it in this form as soon as possible.

I would recommend that you work with Dustin and Delroy to develop the form for CS and then send that with a request for their data. We should do that by December 1.

Bill

Dr. William L. Rooney
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From: Abernathy, Chris [mailto:abernathycr@ornl.gov]
Sent: Wednesday, November 04, 2009 3:09 PM
To: Bisoondat Macoon (bmacoon@ra.msstate.edu); Jeff Pedersen (jeff.pedersen@ars.usda.gov); Juerg Blumenthal (jblumenthal@ag.tamu.edu); Ken Moore (kjmoore@iastate.edu); Ronnie Heiniger (Ron_Heiniger@ncsu.edu); Scott Staggenborg (sstaggen@ksu.edu); Todd Pfeiffer (tpfeiffe@uky.edu); William Rooney (wlr@tamu.edu)
Subject: Sorghum Template

I've attached the final template for Sorghum. I've removed the weather tabs. Dave Muth and I are hoping to collect that information.

Please don't hesitate to call me if you need anything.

Chris

865-244-7488

SITE DESCRIPTION

PI for Field Trial	PMC Number (Golden Field Office Project Management Center)	Experiment Name	Organization/Institution	State	County	Previous land use history (one year before minimum)

Total experimental area (acres)	Individual plot size (acres)	Field Latitude (decimal degrees) *	Field Longitude (decimal degrees)*

* Lat/Long should be taken at the SE corner of the field

2009 Sorghum Yield Data

Please report in METRIC UNITS

Entry	Type	Plot	Rep	Fresh Weight kg/ha	Moisture Content %	Dry Weight kg/ha	Brix %	Grain Yield* kg/ha	Plant height cm	Days to Flowering days	Lodging %	Disease Rating*	Insect Rating*	Carbohydrate Composition (%)			
														Glucan	Xylan	Lignin	Soluble
Graze All 3	PI sorg-sudan		1														
Graze All 3	PI sorg-sudan		2														
Graze All 3	PI sorg-sudan		3														
Graze All 3	PI sorg-sudan		4														
Graze-n-Bale	PS sorg-sudan		1														
Graze-n-Bale	PS sorg-sudan		2														
Graze-n-Bale	PS sorg-sudan		3														
Graze-n-Bale	PS sorg-sudan		4														
22053	PS Silage bmr		1														
22053	PS Silage bmr		2														
22053	PS Silage bmr		3														
22053	PS Silage bmr		4														
TAMUXH08001	PS Energy		1														
TAMUXH08001	PS Energy		2														
TAMUXH08001	PS Energy		3														
TAMUXH08001	PS Energy		4														
M81-E	Sweet		1														
M81-E	Sweet		2														
M81-E	Sweet		3														
M81-E	Sweet		4														
Sugar T	Sweet Silage		1														
Sugar T	Sweet Silage		2														
Sugar T	Sweet Silage		3														
Sugar T	Sweet Silage		4														

* Not all hybrids will produce grain. In those that do, grain yield will be estimated by measuring panicle weight and estimating grain yield on a threshing percentage.
* Disease and Insect Ratings will be made as appropriate to each environment.
* Carbohydrate composition will be completed on each location using NIR scanning technology and composition curves developed collaboratively between NREL and Texas A&M University.

FIELD LEVEL DATA

Plot	Planting Date	Harvest Date	Second Harvest Date (if applicable)	Tillage Operations	Pesticide Applications	Pesticide Application Rate	Pesticide Application Rate-UNITS	Fertilizer application
101								
102								
103								
104								
105								
106								
201								
202								
203								
204								
205								
206								
301								
302								
303								
304								
305								
306								
401								
402								
403								
404								
405								
406								

Fertilizer application rate	Fertilizer app rate-UNITS	Irrigation Date	Amount Irrigation applied (mm)

From:	Bill Rooney
To:	"Delroy Collins"
Subject:	FW:
Date:	Friday, November 06, 2009 1:13:00 PM
Attachments:	10 PR Winter Nursery.xls

Dr. William L. Rooney
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From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Friday, November 06, 2009 1:05 PM
To: 'dustin borden'
Subject:

2245 – 2400 are in place. Nothing before that is set.

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: [redacted]
Date: Friday, November 06, 2009 4:02:00 PM
Attachments: 2009 Coded Lines 11-6.xls

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
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College Station, Texas 77843-2474
979 845 2151

From: Bill Rooney
To: "dustin borden"
Date: Friday, November 06, 2009 3:55:00 PM
Attachments: 10 PR Winter Nursery.xls

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

From: Bill Rooney
To: "Delroy Collins"
Date: Friday, November 06, 2009 3:33:00 PM
Attachments: 10 PR Winter Nursery.xls

Almost finished. 2001-2400 are ready. 2401-2500 will have to wait until Monday.

Bill

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
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College Station, Texas 77843-2474
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From: Bill Rooney
To: "Delroy Collins"
Date: Friday, November 06, 2009 2:54:00 PM
Attachments: 10 PR Winter Nursery.xls

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
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979 845 2151

From:	Bill Rooney
To:	"cs-scsc642600-fall2009@groups.tamu.edu"
Date:	Thursday, November 05, 2009 8:50:00 AM
Attachments:	Simple Lattice.xls fiber yield.xls MAD22.doc MAD22.xls Problem Set 2, Fall 2009.doc Simple Lattice.doc Problem Set 3, Fall 2009.doc

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Problem Sets 2 and 3 – we'll discuss them today in class.

Dr. William L. Rooney
Professor, Sorghum Breeding and Genetics
Chair, Plant Release Committee
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ENTRY	EXPT	LOC	LOCN	YEAR	ENV	REP	GENOTYPE	LNTYLD
1	CC 01	CC	2	1	2	1	96 WD-18	795
1	CC 01	CC	2	1	2	2	96 WD-18	836
1	CC 01	CC	2	1	2	3	96 WD-18	657
2	CC 01	CC	2	1	2	1	96 WD-22	935
2	CC 01	CC	2	1	2	2	96 WD-22	817
2	CC 01	CC	2	1	2	3	96 WD-22	853
3	CC 01	CC	2	1	2	1	96 WD-69s	884
3	CC 01	CC	2	1	2	2	96 WD-69s	668
3	CC 01	CC	2	1	2	3	96 WD-69s	700
4	CC 01	CC	2	1	2	1	96 WD-72	934
4	CC 01	CC	2	1	2	2	96 WD-72	559
4	CC 01	CC	2	1	2	3	96 WD-72	530
5	CC 01	CC	2	1	2	1	96 WD-81	642
5	CC 01	CC	2	1	2	2	96 WD-81	655
5	CC 01	CC	2	1	2	3	96 WD-81	528
6	CC 01	CC	2	1	2	1	FM 832	565
6	CC 01	CC	2	1	2	2	FM 832	757
6	CC 01	CC	2	1	2	3	FM 832	981
7	CC 01	CC	2	1	2	1	STV 474	610
7	CC 01	CC	2	1	2	2	STV 474	798
7	CC 01	CC	2	1	2	3	STV 474	817
8	CC 01	CC	2	1	2	1	Sphinx	732
8	CC 01	CC	2	1	2	2	Sphinx	443
8	CC 01	CC	2	1	2	3	Sphinx	489
1	CC 02	CC	2	2	7	1	96 WD-18	760
1	CC 02	CC	2	2	7	2	96 WD-18	469
1	CC 02	CC	2	2	7	3	96 WD-18	520
2	CC 02	CC	2	2	7	1	96 WD-22	940
2	CC 02	CC	2	2	7	2	96 WD-22	792
2	CC 02	CC	2	2	7	3	96 WD-22	870
3	CC 02	CC	2	2	7	1	96 WD-69s	444
3	CC 02	CC	2	2	7	2	96 WD-69s	413
3	CC 02	CC	2	2	7	3	96 WD-69s	758
4	CC 02	CC	2	2	7	1	96 WD-72	807
4	CC 02	CC	2	2	7	2	96 WD-72	775
4	CC 02	CC	2	2	7	3	96 WD-72	782
5	CC 02	CC	2	2	7	1	96 WD-81	936
5	CC 02	CC	2	2	7	2	96 WD-81	663
5	CC 02	CC	2	2	7	3	96 WD-81	954
6	CC 02	CC	2	2	7	1	FM 832	482
6	CC 02	CC	2	2	7	2	FM 832	716
6	CC 02	CC	2	2	7	3	FM 832	824
7	CC 02	CC	2	2	7	1	STV 474	482
7	CC 02	CC	2	2	7	2	STV 474	647
7	CC 02	CC	2	2	7	3	STV 474	1026
8	CC 02	CC	2	2	7	1	Sphinx	648
8	CC 02	CC	2	2	7	2	Sphinx	758
8	CC 02	CC	2	2	7	3	Sphinx	747
1	D 01	D	4	1	4	1	96 WD-18	721
1	D 01	D	4	1	4	2	96 WD-18	607
1	D 01	D	4	1	4	3	96 WD-18	639

2	D 01	D		4	1	4	1	96 WD-22	849
2	D 01	D		4	1	4	2	96 WD-22	890
2	D 01	D		4	1	4	3	96 WD-22	878
3	D 01	D		4	1	4	1	96 WD-69s	723
3	D 01	D		4	1	4	2	96 WD-69s	556
3	D 01	D		4	1	4	3	96 WD-69s	570
4	D 01	D		4	1	4	1	96 WD-72	680
4	D 01	D		4	1	4	2	96 WD-72	701
4	D 01	D		4	1	4	3	96 WD-72	796
5	D 01	D		4	1	4	1	96 WD-81	732
5	D 01	D		4	1	4	2	96 WD-81	548
5	D 01	D		4	1	4	3	96 WD-81	763
6	D 01	D		4	1	4	1	FM 832	677
6	D 01	D		4	1	4	2	FM 832	533
6	D 01	D		4	1	4	3	FM 832	667
7	D 01	D		4	1	4	1	STV 474	709
7	D 01	D		4	1	4	2	STV 474	809
7	D 01	D		4	1	4	3	STV 474	783
8	D 01	D		4	1	4	1	Sphinx	557
8	D 01	D		4	1	4	2	Sphinx	516
8	D 01	D		4	1	4	3	Sphinx	593
1	D 02	D		4	2	9	1	96 WD-18	792
1	D 02	D		4	2	9	2	96 WD-18	666
1	D 02	D		4	2	9	3	96 WD-18	717
2	D 02	D		4	2	9	1	96 WD-22	988
2	D 02	D		4	2	9	2	96 WD-22	1010
2	D 02	D		4	2	9	3	96 WD-22	949
3	D 02	D		4	2	9	1	96 WD-69s	896
3	D 02	D		4	2	9	2	96 WD-69s	907
3	D 02	D		4	2	9	3	96 WD-69s	916
4	D 02	D		4	2	9	1	96 WD-72	803
4	D 02	D		4	2	9	2	96 WD-72	726
4	D 02	D		4	2	9	3	96 WD-72	755
5	D 02	D		4	2	9	1	96 WD-81	895
5	D 02	D		4	2	9	2	96 WD-81	952
5	D 02	D		4	2	9	3	96 WD-81	750
6	D 02	D		4	2	9	1	FM 832	655
6	D 02	D		4	2	9	2	FM 832	928
6	D 02	D		4	2	9	3	FM 832	909
7	D 02	D		4	2	9	1	STV 474	775
7	D 02	D		4	2	9	2	STV 474	873
7	D 02	D		4	2	9	3	STV 474	774
8	D 02	D		4	2	9	1	Sphinx	796
8	D 02	D		4	2	9	2	Sphinx	821
8	D 02	D		4	2	9	3	Sphinx	726
1	T 01	T		3	1	3	1	96 WD-18	276
1	T 01	T		3	1	3	2	96 WD-18	260
1	T 01	T		3	1	3	3	96 WD-18	248
2	T 01	T		3	1	3	1	96 WD-22	629
2	T 01	T		3	1	3	2	96 WD-22	500
2	T 01	T		3	1	3	3	96 WD-22	407
3	T 01	T		3	1	3	1	96 WD-69s	385

3	T 01	T	3	1	3	2	96 WD-69s	491
3	T 01	T	3	1	3	3	96 WD-69s	552
4	T 01	T	3	1	3	1	96 WD-72	400
4	T 01	T	3	1	3	2	96 WD-72	415
4	T 01	T	3	1	3	3	96 WD-72	398
5	T 01	T	3	1	3	1	96 WD-81	286
5	T 01	T	3	1	3	2	96 WD-81	302
5	T 01	T	3	1	3	3	96 WD-81	317
6	T 01	T	3	1	3	1	FM 832	450
6	T 01	T	3	1	3	2	FM 832	423
6	T 01	T	3	1	3	3	FM 832	451
7	T 01	T	3	1	3	1	STV 474	373
7	T 01	T	3	1	3	2	STV 474	418
7	T 01	T	3	1	3	3	STV 474	400
8	T 01	T	3	1	3	1	Sphinx	190
8	T 01	T	3	1	3	2	Sphinx	402
8	T 01	T	3	1	3	3	Sphinx	374
1	T 02	T	3	2	8	1	96 WD-18	580
1	T 02	T	3	2	8	2	96 WD-18	644
1	T 02	T	3	2	8	3	96 WD-18	544
2	T 02	T	3	2	8	1	96 WD-22	640
2	T 02	T	3	2	8	2	96 WD-22	499
2	T 02	T	3	2	8	3	96 WD-22	708
3	T 02	T	3	2	8	1	96 WD-69s	525
3	T 02	T	3	2	8	2	96 WD-69s	530
3	T 02	T	3	2	8	3	96 WD-69s	539
4	T 02	T	3	2	8	1	96 WD-72	440
4	T 02	T	3	2	8	2	96 WD-72	454
4	T 02	T	3	2	8	3	96 WD-72	471
5	T 02	T	3	2	8	1	96 WD-81	683
5	T 02	T	3	2	8	2	96 WD-81	437
5	T 02	T	3	2	8	3	96 WD-81	578
6	T 02	T	3	2	8	1	FM 832	694
6	T 02	T	3	2	8	2	FM 832	555
6	T 02	T	3	2	8	3	FM 832	658
7	T 02	T	3	2	8	1	STV 474	565
7	T 02	T	3	2	8	2	STV 474	661
7	T 02	T	3	2	8	3	STV 474	530
8	T 02	T	3	2	8	1	Sphinx	419
8	T 02	T	3	2	8	2	Sphinx	567
8	T 02	T	3	2	8	3	Sphinx	495
1	U 01	U	5	1	5	1	96 WD-18	1018
1	U 01	U	5	1	5	2	96 WD-18	983
1	U 01	U	5	1	5	3	96 WD-18	1114
2	U 01	U	5	1	5	1	96 WD-22	1107
2	U 01	U	5	1	5	2	96 WD-22	1011
2	U 01	U	5	1	5	3	96 WD-22	1095
3	U 01	U	5	1	5	1	96 WD-69s	1023
3	U 01	U	5	1	5	2	96 WD-69s	993
3	U 01	U	5	1	5	3	96 WD-69s	950
4	U 01	U	5	1	5	1	96 WD-72	1043
4	U 01	U	5	1	5	2	96 WD-72	970

4	U 01	U	5	1	5	3	96 WD-72	1030
5	U 01	U	5	1	5	1	96 WD-81	1079
5	U 01	U	5	1	5	2	96 WD-81	964
5	U 01	U	5	1	5	3	96 WD-81	1067
6	U 01	U	5	1	5	1	FM 832	989
6	U 01	U	5	1	5	2	FM 832	932
6	U 01	U	5	1	5	3	FM 832	960
7	U 01	U	5	1	5	1	STV 474	1097
7	U 01	U	5	1	5	2	STV 474	942
7	U 01	U	5	1	5	3	STV 474	1215
8	U 01	U	5	1	5	1	Sphinx	1151
8	U 01	U	5	1	5	2	Sphinx	1078
8	U 01	U	5	1	5	3	Sphinx	1077
1	U 02	U	5	2	10	1	96 WD-18	895
1	U 02	U	5	2	10	2	96 WD-18	1068
1	U 02	U	5	2	10	3	96 WD-18	1155
2	U 02	U	5	2	10	1	96 WD-22	1314
2	U 02	U	5	2	10	2	96 WD-22	1455
2	U 02	U	5	2	10	3	96 WD-22	1358
3	U 02	U	5	2	10	1	96 WD-69s	1297
3	U 02	U	5	2	10	2	96 WD-69s	1498
3	U 02	U	5	2	10	3	96 WD-69s	1401
4	U 02	U	5	2	10	1	96 WD-72	962
4	U 02	U	5	2	10	2	96 WD-72	967
4	U 02	U	5	2	10	3	96 WD-72	996
5	U 02	U	5	2	10	1	96 WD-81	1180
5	U 02	U	5	2	10	2	96 WD-81	1269
5	U 02	U	5	2	10	3	96 WD-81	1250
6	U 02	U	5	2	10	1	FM 832	1303
6	U 02	U	5	2	10	2	FM 832	1267
6	U 02	U	5	2	10	3	FM 832	886
7	U 02	U	5	2	10	1	STV 474	1209
7	U 02	U	5	2	10	2	STV 474	909
7	U 02	U	5	2	10	3	STV 474	1011
8	U 02	U	5	2	10	1	Sphinx	730
8	U 02	U	5	2	10	2	Sphinx	925
8	U 02	U	5	2	10	3	Sphinx	840
1	W 01	W	1	1	1	1	96 WD-18	1249
1	W 01	W	1	1	1	2	96 WD-18	1254
1	W 01	W	1	1	1	3	96 WD-18	967
2	W 01	W	1	1	1	1	96 WD-22	1468
2	W 01	W	1	1	1	2	96 WD-22	970
2	W 01	W	1	1	1	3	96 WD-22	1537
3	W 01	W	1	1	1	1	96 WD-69s	1292
3	W 01	W	1	1	1	2	96 WD-69s	1091
3	W 01	W	1	1	1	3	96 WD-69s	1274
4	W 01	W	1	1	1	1	96 WD-72	1457
4	W 01	W	1	1	1	2	96 WD-72	1392
4	W 01	W	1	1	1	3	96 WD-72	901
5	W 01	W	1	1	1	1	96 WD-81	1296
5	W 01	W	1	1	1	2	96 WD-81	1472
5	W 01	W	1	1	1	3	96 WD-81	946

6	W	01	W	1	1	1	1	FM 832	1042
6	W	01	W	1	1	1	2	FM 832	983
6	W	01	W	1	1	1	3	FM 832	1123
7	W	01	W	1	1	1	1	STV 474	1267
7	W	01	W	1	1	1	2	STV 474	1320
7	W	01	W	1	1	1	3	STV 474	1397
8	W	01	W	1	1	1	1	Sphinx	845
8	W	01	W	1	1	1	2	Sphinx	1049
8	W	01	W	1	1	1	3	Sphinx	903
1	W	02	W	1	2	6	1	96 WD-18	748
1	W	02	W	1	2	6	2	96 WD-18	543
1	W	02	W	1	2	6	3	96 WD-18	609
2	W	02	W	1	2	6	1	96 WD-22	930
2	W	02	W	1	2	6	2	96 WD-22	899
2	W	02	W	1	2	6	3	96 WD-22	783
3	W	02	W	1	2	6	1	96 WD-69s	584
3	W	02	W	1	2	6	2	96 WD-69s	543
3	W	02	W	1	2	6	3	96 WD-69s	726
4	W	02	W	1	2	6	1	96 WD-72	676
4	W	02	W	1	2	6	2	96 WD-72	834
4	W	02	W	1	2	6	3	96 WD-72	734
5	W	02	W	1	2	6	1	96 WD-81	567
5	W	02	W	1	2	6	2	96 WD-81	595
5	W	02	W	1	2	6	3	96 WD-81	792
6	W	02	W	1	2	6	1	FM 832	571
6	W	02	W	1	2	6	2	FM 832	770
6	W	02	W	1	2	6	3	FM 832	654
7	W	02	W	1	2	6	1	STV 474	613
7	W	02	W	1	2	6	2	STV 474	689
7	W	02	W	1	2	6	3	STV 474	824
8	W	02	W	1	2	6	1	Sphinx	524
8	W	02	W	1	2	6	2	Sphinx	425
8	W	02	W	1	2	6	3	Sphinx	418

A N A L Y S I S O F V A R I A N C E

11/11/2003 Modified Augmented Design (2): Control Plots ANOVA

Dependent variable: YLD

Source	df	SS	MS	F-value	Pr> F
Total	15	455.716			
Rows	3	213.119	71.040	13.69	0.0011
Columns	3	195.911	65.304	12.59	0.0014
Residual	9	46.686	5.187		

Grand mean = 61.001 R-squared = 0.9886 C.V. = 3.73%

Whole-plot error = 5.187
Sub-plot error = 3.441

---------- Control plot means (unadjusted)----------

No. 1: 61.001

Table of YLD Adjusted Under Method 1, Relative to % Of Adjusted Checks

No.	Variety Name	Adjusted Mean	Rnk	Unadjusted Mean	Rnk	Rel. %	Adjustment Mean	Rnk	N
9010	CONTROL	65.64	1	65.91	16	107.7	-0.27	15	1
38	LINE-0138	64.93	2	71.12	3	106.6	-6.19	1	1
18	LINE-0118	64.55	3	64.23	26	105.9	0.32	23	1
9036	SUB-CONTROL B	64.41	4	67.96	10	105.7	-3.55	6	1
25	LINE-0125	64.32	5	61.11	40	105.6	3.21	35	1
46	LINE-0146	64.19	6	67.74	11	105.3	-3.55	5	1
48	LINE-0148	64.01	7	64.28	25	105.0	-0.27	18	1
9026	SUB-CONTROL A	63.74	8	67.29	13	104.6	-3.55	5	1
47	LINE-0147	63.60	9	63.87	29	104.4	-0.27	20	1
26	LINE-0126	63.34	10	60.13	49	103.9	3.21	39	1
37	LINE-0137	63.23	11	69.42	6	103.8	-6.19	-5	1
20	LINE-0120	63.19	12	59.78	51	103.7	3.41	39	1
5	LINE-0105	63.08	13	60.02	50	103.5	3.06	37	1
34	LINE-0134	62.78	14	65.95	15	103.0	-3.17	1	1
11	LINE-0111	62.77	15	65.48	19	103.0	-2.71	4	1
31	LINE-0131	62.66	16	62.73	34	102.8	-0.07	18	1
14	LINE-0114	62.54	17	65.25	20	102.6	-2.71	3	1
10	LINE-0110	62.54	18	62.51	35	102.6	0.03	17	1
12	LINE-0112	62.52	19	65.23	21	102.6	-2.71	2	1
9010	CONTROL	62.49	20	65.20	22	102.6	-2.71	2	1
39	LINE-0139	62.39	21	68.58	7	102.4	-6.19	-14	1
9010	CONTROL	62.32	22	65.49	18	102.3	-3.17	-4	1
9028	SUB-CONTROL A	62.31	23	62.28	36	102.3	0.03	13	1
9038	SUB-CONTROL B	62.27	24	62.24	37	102.2	0.03	13	1
22	LINE-0122	62.22	25	58.81	55	102.1	3.41	30	1
9027	SUB-CONTROL A	62.09	26	55.40	66	101.9	6.69	40	1
9010	CONTROL	62.07	27	59.01	53	101.9	3.06	26	1
9010	CONTROL	62.00	28	62.07	38	101.7	-0.07	10	1
44	LINE-0144	61.88	29	68.53	8	101.6	-6.65	-21	1
9010	CONTROL	61.75	30	55.60	65	101.3	6.15	35	1

32	LINE-0132	61.68	31	61.75	39	101.2	-0.07	8	1
42	LINE-0142	61.61	32	71.28	1	101.1	-9.67	-31	1
6	LINE-0106	61.50	33	58.44	56	100.9	3.06	23	1
9031	SUB-CONTROL B	61.49	34	71.16	2	100.9	-9.67	-32	1
9021	SUB-CONTROL A	61.44	35	71.11	4	100.8	-9.67	-31	1
17	LINE-0117	61.28	36	60.96	43	100.6	0.32	7	1
4	LINE-0104	61.19	37	55.04	67	100.4	6.15	30	1
9010	CONTROL	61.16	38	60.84	46	100.4	0.32	8	1
3	LINE-0103	61.12	39	54.97	68	100.3	6.15	29	1
9010	CONTROL	61.05	40	57.64	59	100.2	3.41	19	1
28	LINE-0128	61.04	41	57.83	58	100.2	3.21	17	1
9025	SUB-CONTROL A	61.01	42	67.66	12	100.1	-6.65	-30	1
9	LINE-0109	61.01	43	60.98	42	100.1	0.03	-1	1
9010	CONTROL	60.96	44	60.93	44	100.0	0.03	0	1
30	LINE-0130	60.84	45	60.91	45	99.8	-0.07	0	1
9024	SUB-CONTROL A	60.79	46	61.06	41	99.8	-0.27	-5	1
9010	CONTROL	60.71	47	70.38	5	99.6	-9.67	-42	1
9032	SUB-CONTROL B	60.56	48	54.41	69	99.4	6.15	21	1
9034	SUB-CONTROL B	60.53	49	60.80	47	99.3	-0.27	-2	1
27	LINE-0127	60.50	50	57.29	60	99.3	3.21	10	1
35	LINE-0135	60.45	51	63.62	30	99.2	-3.17	-21	1
45	LINE-0145	60.45	52	64.00	28	99.2	-3.55	-24	1
13	LINE-0113	60.43	53	63.14	32	99.2	-2.71	-21	1
36	LINE-0136	60.41	54	63.58	31	99.2	-3.17	-23	1
7	LINE-0107	60.34	55	57.28	61	99.0	3.06	6	1
23	LINE-0123	60.30	56	53.61	72	99.0	6.69	16	1
9022	SUB-CONTROL A	60.01	57	53.86	71	98.5	6.15	14	1
9010	CONTROL	59.85	58	66.04	14	98.2	-6.19	-44	1
9010	CONTROL	59.84	59	56.63	62	98.2	3.21	3	1
9037	SUB-CONTROL B	59.69	60	53.00	73	98.0	6.69	13	1
40	LINE-0140	59.52	61	65.71	17	97.7	-6.19	-44	1
9010	CONTROL	59.30	62	52.61	74	97.3	6.69	12	1
15	LINE-0115	59.23	63	58.91	54	97.2	0.32	-9	1
9010	CONTROL	59.23	64	49.80	76	97.2	9.43	12	1
9010	CONTROL	59.21	65	62.76	33	97.2	-3.55	-32	1
19	LINE-0119	59.16	66	55.75	63	97.1	3.41	-3	1
29	LINE-0129	58.95	67	59.02	52	96.7	-0.07	-15	1
2	LINE-0102	58.86	68	49.43	77	96.6	9.43	9	1
8	LINE-0108	58.80	69	55.74	64	96.5	3.06	-5	1
9032	SUB-CONTROL B	58.76	70	49.33	78	96.4	9.43	8	1
41	LINE-0141	58.75	71	68.42	9	96.4	-9.67	-62	1
16	LINE-0116	58.70	72	58.38	57	96.3	0.32	-15	1
9010	CONTROL	58.45	73	65.10	23	95.9	-6.65	-50	1
43	LINE-0143	58.15	74	64.80	24	95.4	-6.65	-50	1
1	LINE-0101	58.09	75	48.66	79	95.3	9.43	4	1
24	LINE-0124	58.06	76	51.37	75	95.3	6.69	-1	1
21	LINE-0121	57.74	77	54.33	70	94.8	3.41	-7	1
9035	SUB-CONTROL B	57.54	78	64.19	27	94.4	-6.65	-51	1
33	LINE-0133	57.54	79	60.71	48	94.4	-3.17	-31	1
9022	SUB-CONTROL A	57.17	80	47.74	80	93.8	9.43	0	1

Grand Mean = 60.93

Adjusted mean of all control plot and sub-control plot checks = 60.9313

Method 3 regression coeff. = 1.003

Table of YLD Adjusted Under Method 3, Relative to % Of Unadjusted Checks

No.	Variety Name	Adjusted Mean	Rnk	Unadjusted Mean	Rnk	Rel. %	Adjustment Mean	Rnk	N
9036	SUB-CONTROL B	66.19	1	67.96	9	108.9	-1.77	8	1
38	LINE-0138	66.06	2	71.12	3	108.7	-5.06	1	1
46	LINE-0146	65.97	3	67.74	10	108.5	-1.77	7	1
9026	SUB-CONTROL A	65.52	4	67.29	12	107.8	-1.77	8	1
25	LINE-0125	65.50	5	61.11	32	107.7	4.39	27	1
26	LINE-0126	64.52	6	60.13	39	106.1	4.39	33	1
44	LINE-0144	64.42	7	68.53	7	106.0	-4.11	0	1
18	LINE-0118	64.39	8	64.23	20	105.9	0.16	12	1
37	LINE-0137	64.36	9	69.42	5	105.9	-5.06	-4	1
9027	SUB-CONTROL A	63.82	10	55.40	52	105.0	8.42	42	1
9025	SUB-CONTROL A	63.55	11	67.66	11	104.5	-4.11	0	1
39	LINE-0139	63.52	12	68.58	6	104.5	-5.06	-6	1
20	LINE-0120	63.15	13	59.78	41	103.9	3.37	28	1
10	LINE-0110	62.58	14	62.51	28	102.9	0.07	14	1
9028	SUB-CONTROL A	62.35	15	62.28	29	102.6	0.07	14	1
9038	SUB-CONTROL B	62.31	16	62.24	30	102.5	0.07	14	1
45	LINE-0145	62.23	17	64.00	22	102.4	-1.77	5	1
28	LINE-0128	62.22	18	57.83	47	102.3	4.39	29	1
22	LINE-0122	62.18	19	58.81	44	102.3	3.37	25	1
23	LINE-0123	62.03	20	53.61	58	102.0	8.42	38	1
5	LINE-0105	62.02	21	60.02	40	102.0	2.00	19	1
42	LINE-0142	61.87	22	71.28	1	101.8	-9.41	-21	1
9031	SUB-CONTROL B	61.75	23	71.16	2	101.6	-9.41	-21	1
9021	SUB-CONTROL A	61.70	24	71.11	4	101.5	-9.41	-20	1
27	LINE-0127	61.68	25	57.29	48	101.4	4.39	23	1
31	LINE-0131	61.66	26	62.73	27	101.4	-1.07	1	1
34	LINE-0134	61.45	27	65.95	13	101.1	-4.50	-14	1
9037	SUB-CONTROL B	61.42	28	53.00	59	101.0	8.42	31	1
11	LINE-0111	61.27	29	65.48	15	100.8	-4.21	-14	1
17	LINE-0117	61.12	30	60.96	35	100.5	0.16	5	1
9	LINE-0109	61.05	31	60.98	34	100.4	0.07	3	1
14	LINE-0114	61.04	32	65.25	16	100.4	-4.21	-16	1
12	LINE-0112	61.02	33	65.23	17	100.4	-4.21	-16	1
43	LINE-0143	60.69	34	64.80	18	99.8	-4.11	-16	1
32	LINE-0132	60.68	35	61.75	31	99.8	-1.07	-4	1
2	LINE-0102	60.67	36	49.43	61	99.8	11.24	25	1
40	LINE-0140	60.65	37	65.71	14	99.8	-5.06	-23	1
9032	SUB-CONTROL B	60.57	38	49.33	62	99.6	11.24	24	1
4	LINE-0104	60.46	39	55.04	53	99.4	5.42	14	1
6	LINE-0106	60.44	40	58.44	45	99.4	2.00	5	1
3	LINE-0103	60.39	41	54.97	54	99.3	5.42	13	1
9035	SUB-CONTROL B	60.08	42	64.19	21	98.8	-4.11	-21	1
1	LINE-0101	59.90	43	48.66	63	98.5	11.24	20	1
30	LINE-0130	59.84	44	60.91	36	98.4	-1.07	-8	1
9032	SUB-CONTROL B	59.83	45	54.41	55	98.4	5.42	10	1
24	LINE-0124	59.79	46	51.37	60	98.3	8.42	14	1
48	LINE-0148	59.35	47	64.28	19	97.6	-4.93	-28	1
9022	SUB-CONTROL A	59.28	48	53.86	57	97.5	5.42	9	1
7	LINE-0107	59.28	49	57.28	49	97.5	2.00	0	1
19	LINE-0119	59.12	50	55.75	50	97.2	3.37	0	1
35	LINE-0135	59.12	51	63.62	24	97.2	-4.50	-27	1

36	LINE-0136	59.08	52	63.58	25	97.2	-4.50	-27	1
15	LINE-0115	59.07	53	58.91	43	97.2	0.16	-10	1
41	LINE-0141	59.01	54	68.42	8	97.1	-9.41	-46	1
9022	SUB-CONTROL A	58.98	55	47.74	64	97.0	11.24	9	1
47	LINE-0147	58.94	56	63.87	23	97.0	-4.93	-33	1
13	LINE-0113	58.93	57	63.14	26	96.9	-4.21	-31	1
16	LINE-0116	58.54	58	58.38	46	96.3	0.16	-12	1
29	LINE-0129	57.95	59	59.02	42	95.3	-1.07	-17	1
8	LINE-0108	57.74	60	55.74	51	95.0	2.00	-9	1
21	LINE-0121	57.70	61	54.33	56	94.9	3.37	-5	1
33	LINE-0133	56.21	62	60.71	38	92.4	-4.50	-24	1
9024	SUB-CONTROL A	56.13	63	61.06	33	92.3	-4.93	-30	1
9034	SUB-CONTROL B	55.87	64	60.80	37	91.9	-4.93	-27	1

Grand Mean = 60.80

Mean of all unadjusted control plot and sub-control plot checks = 60.7969

------- Relative efficiencies from check variances (unadj./adj. * 100) -------

Method 1: 1649.8
Method 3: 653.57

Correlations for test entry values

r	t	Prob.	
0.56	4.592	0.000	YLD with YLD_MTHD_1
0.40	2.981	0.006	YLD with YLD_MTHD_3
0.68	6.284	0.000	YLD_MTHD_1 with YLD_MTHD_3

d.f. = 46

▪

ENTRY	NAME	PLOT	ROW	COL	CP	CSP	YLD	YLD_MTHD_1	YLD_MTHD_3
1	LINE-0101	1	1	1	0	0	48.66	58	60
2	LINE-0102	2	1	1	0	0	49.43	59	61
9010	CONTROL	3	1	1	1	0	49.80	59	50
9032	SUB-CONTROL B	4	1	1	0	2	49.33	59	61
9022	SUB-CONTROL A	5	1	1	0	1	47.74	57	59
3	LINE-0103	6	1	2	0	0	54.97	61	60
9022	SUB-CONTROL A	7	1	2	0	1	53.86	60	59
9010	CONTROL	8	1	2	1	0	55.60	62	56
9032	SUB-CONTROL B	9	1	2	0	2	54.41	61	60
4	LINE-0104	10	1	2	0	0	55.04	61	60
5	LINE-0105	11	1	3	0	0	60.02	63	62
6	LINE-0106	12	1	3	0	0	58.44	61	60
9010	CONTROL	13	1	3	1	0	59.01	62	59
7	LINE-0107	14	1	3	0	0	57.28	60	59
8	LINE-0108	15	1	3	0	0	55.74	59	58
9038	SUB-CONTROL B	16	1	4	0	2	62.24	62	62
9	LINE-0109	17	1	4	0	0	60.98	61	61
9010	CONTROL	18	1	4	1	0	60.93	61	61
9028	SUB-CONTROL A	19	1	4	0	1	62.28	62	62
10	LINE-0110	20	1	4	0	0	62.51	63	63
11	LINE-0111	21	2	4	0	0	65.48	63	61
12	LINE-0112	22	2	4	0	0	65.23	63	61
9010	CONTROL	23	2	4	1	0	65.20	62	65
13	LINE-0113	24	2	4	0	0	63.14	60	59
14	LINE-0114	25	2	4	0	0	65.25	63	61
15	LINE-0115	26	2	3	0	0	58.91	59	59
16	LINE-0116	27	2	3	0	0	58.38	59	59
9010	CONTROL	28	2	3	1	0	60.84	61	61
17	LINE-0117	29	2	3	0	0	60.96	61	61
18	LINE-0118	30	2	3	0	0	64.23	65	64
19	LINE-0119	31	2	2	0	0	55.75	59	59
20	LINE-0120	32	2	2	0	0	59.78	63	63
9010	CONTROL	33	2	2	1	0	57.64	61	58
21	LINE-0121	34	2	2	0	0	54.33	58	58
22	LINE-0122	35	2	2	0	0	58.81	62	62
23	LINE-0123	36	2	1	0	0	53.61	60	62
24	LINE-0124	37	2	1	0	0	51.37	58	60
9010	CONTROL	38	2	1	1	0	52.61	59	53
9027	SUB-CONTROL A	39	2	1	0	1	55.40	62	64
9037	SUB-CONTROL B	40	2	1	0	2	53.00	60	61
25	LINE-0125	41	3	1	0	0	61.11	64	65
26	LINE-0126	42	3	1	0	0	60.13	63	65
9010	CONTROL	43	3	1	1	0	56.63	60	57
27	LINE-0127	44	3	1	0	0	57.29	60	62
28	LINE-0128	45	3	1	0	0	57.83	61	62
29	LINE-0129	46	3	2	0	0	59.02	59	58
30	LINE-0130	47	3	2	0	0	60.91	61	60
9010	CONTROL	48	3	2	1	0	62.07	62	62
31	LINE-0131	49	3	2	0	0	62.73	63	62
32	LINE-0132	50	3	2	0	0	61.75	62	61
33	LINE-0133	51	3	3	0	0	60.71	58	56

34	LINE-0134	52	3	3	0	0	65.95	63	61
9010	CONTROL	53	3	3	1	0	65.49	62	65
35	LINE-0135	54	3	3	0	0	63.62	60	59
36	LINE-0136	55	3	3	0	0	63.58	60	59
37	LINE-0137	56	3	4	0	0	69.42	63	64
38	LINE-0138	57	3	4	0	0	71.12	65	66
9010	CONTROL	58	3	4	1	0	66.04	60	66
39	LINE-0139	59	3	4	0	0	68.58	62	64
40	LINE-0140	60	3	4	0	0	65.71	60	61
9031	SUB-CONTROL B	61	4	4	0	2	71.16	61	62
9021	SUB-CONTROL A	62	4	4	0	1	71.11	61	62
9010	CONTROL	63	4	4	1	0	70.38	61	70
41	LINE-0141	64	4	4	0	0	68.42	59	59
42	LINE-0142	65	4	4	0	0	71.28	62	62
9025	SUB-CONTROL A	66	4	3	0	1	67.66	61	64
43	LINE-0143	67	4	3	0	0	64.80	58	61
9010	CONTROL	68	4	3	1	0	65.10	58	65
44	LINE-0144	69	4	3	0	0	68.53	62	64
9035	SUB-CONTROL B	70	4	3	0	2	64.19	58	60
45	LINE-0145	71	4	2	0	0	64.00	60	62
46	LINE-0146	72	4	2	0	0	67.74	64	66
9010	CONTROL	73	4	2	1	0	62.76	59	63
9036	SUB-CONTROL B	74	4	2	0	2	67.96	64	66
9026	SUB-CONTROL A	75	4	2	0	1	67.29	64	66
9024	SUB-CONTROL A	76	4	1	0	1	61.06	61	56
47	LINE-0147	77	4	1	0	0	63.87	64	59
9010	CONTROL	78	4	1	1	0	65.91	66	66
48	LINE-0148	79	4	1	0	0	64.28	64	59
9034	SUB-CONTROL B	80	4	1	0	2	60.80	61	56

AGRO 642
Problem Set 2
Individual and Combined Data Analysis
Fall 2009

1. Below is yield data (bu/acre) data from a single experiment with four varieties in one environment with four replications.

	Block			
Cultivar	1	2	3	4
Morex	54	65	74	59
Exp 1	53	54	66	55
Exp 2	55	53	67	56
Exp 3	47	52	62	52

   a. Analyze the data using the model Yield = μ + cultivar + error. **Complete calculations by hand and show tests of significance!**
   b. Analyze the data using the model Yield = μ + cultivar + error. **Complete calculations by hand and show tests of significance!**
   c. In 1(b), calculate the L.S.D. and test for statistical differences in means among entries.
   d. Complete a contrast between Morex (check) and the three experimental lines. Is there a statistical difference?

2. The objective of this problem is to analyze data from a simple lattice. The data (yield from two separate locations, designated as Yield 1 and Yield 2) is included in the file simple lattice.xls and the output of this analysis is included in simple lattice.doc. Use this analysis to make inferences on the results.
   a. Describe the number of entries/block, the number of blocks and the number of replications in this data set.
   b. For each variable, determine the relative efficiency of the incomplete blocking and whether or not the incomplete block analysis was effective or necessary for reducing spatial variation.
   c. For each environment, describe the number of lines to advance and which ones they would be. Would they be similar in both environments?

3. The objective of this problem is to analyze data from a modified augmented design (type 1) of a wheat trial. The data (yield only) is included in the file mad22.xls. The trial layout is in the diagram below. The analysis of this data set is in the file mad22.doc. Use this analysis to make inferences on the results.
   a. Is there a row and column effect in this trial?
   b. Should the data be adjusted for comparison purposes?
   c. Describe the differences in adjustment of the data using Method 1 vs. Method 3.
   d. Which method is most appropriate for adjusting the data? Explain why this method is best.
   e. Would you use this data for breeding decisions?
   f. Describe how you would use this data to make decisions, and then identify how many and which genotypes you would advance.

	col 1		col 2		col 3		col 4	
	01	49	03	55	05	60	B	62
	02	49	A	54	06	58	09	61
row 1	C	50	C	56	C	59	C	61
	B	49	B	54	07	57	A	62
	A	48	04	55	08	56	10	63
	23	54	19	56	15	59	11	65
	24	52	20	60	16	58	12	65
row 2	C	53	C	58	C	61	C	65
	A	55	21	54	17	61	13	63
	B	53	22	59	18	64	14	65
	25	61	29	59	33	61	37	69
	26	60	30	61	34	66	38	71
row 3	C	57	C	62	C	65	C	66
	27	57	31	63	35	64	39	69
	28	58	32	62	36	64	40	66
	A	61	45	64	A	68	B	71
	47	64	46	68	43	65	A	71
row 4	C	66	C	63	C	65	C	70
	48	64	B	68	44	69	41	68
	B	61	A	67	B	64	42	71

4. Use statistical analysis software of your choice to complete the analysis of the data in the file "Fiber Yield.xls". This file contains lint yield data from a uniform advanced cotton breeding trial grown in five locations over two years. Details of the data included in the trial are as follows:

   Entries: 8 — 5 experimental cotton lines (WD-18, WD-22, WD-69s, WD-72, WD-81)
   3 cotton cultivar checks (FM832, STV474, Sphinx)

   Locations: 5 — Weslaco (W), Corpus Christi (C), Thrall (T), Dallas (D), and U (Uvalde)

   Years: 2 — 2001 and 2002

   Total Environments: 10 with all cultivars in every environment

   Reps/Environment: 3 reps per environment

   Dependent Variable in Dataset: Fiber Yield (lbs/acre) in Fiber Yield.xls

   a. Complete the individual environment analysis.
   b. Test for the homogeneity of error across environments. Based on this analysis, determine if it is appropriate to combine the data.
   c. Write the expected mean squares for the combined analysis, designating entries as fixed and all other factors as random effects.
   d. Conduct the combined analysis (regardless of the results from homogeneity tests) and appropriate tests of significance for the terms of the model.
   e. Calculate the estimates of σ_e^2, σ_{gly}^2, σ_{gl}^2, σ_{gy}^2 and σ_g^2 based on expected mean squares and experimental data.
   f. Calculate the repeatability (and standard error) using these estimates.

g. Based on the results, which interaction terms are the most critical for yield in cotton evaluation in Texas?
h. Use to the calculated values of σ_e^2, σ_{gly}^2, σ_{gl}^2, σ_{gy}^2 to determine the most effective partition of resources into replications, locations and years. They are currently using 30 total observations, which are divided into 2 years, 5 locations, and 3 reps/location. The most effective partition of resources is the number of locations, years and replications that results in the lowest cumulative value for the sum of σ_e^2, σ_{gly}^2, σ_{gl}^2, σ_{gy}^2. Is the most effective partition reasonable? If not, what would you recommend?

5. Stability Analysis – Use data to calculate stability estimates using 3 different methods proposed in the literature. You may use any statistical software to complete this work. Potential methods of estimating stability are listed below, but other may be used as well!

   a. Potential Stability Parameters:
      i. Wricke's Ecovalence (Wricke, 1962, A. Pflanzensucht 47:92)
      ii. Shukla's Stability Variance Estimate (Shukla, 1972, Heredity 29:127)
      iii. Nassar-Huehn Rank Tests (Nassar-Huehn, 1987, Biometrics 43:45)
      iv. Eberhart-Russell stability regression (Eberhart and Russell, 1966, Crop Sci 6:36)
      v. AMMI model (Zobel et al., 1988 Agron. J. 80:388)
   b. Rank the hybrids for stability (1-most stable to 6-least stable) using each method based on the definition of stability for that method.
   c. How consistent were the methods in ranking the hybrids for stability?
   d. Which method do you consider the best for estimating stability?

AGRO 642
Problem Set 3
Fall 2009

Due to political mandates that dictate we will not use "food" crops for biofuel, the fledgling biofuel industry is grasping for alternative plant species as sources of biomass for biofuel conversion.

Worldwide five prominently mentioned species are tropical sugarbeets, switchgrass, camelina, miscanthus and algae. None of these crops have much commercial production but all have been widely publicized as the answer to our biomass production problems.

A company interested in commercially selling these new crop species must define the potential strengths, weaknesses, opportunities and threats to a new seed company venture focusing on these particular crop species. They have hired your group (3 groups, 4 students/group) to make a recommendation in which of these crop(s) they should invest.

Each group will <u>independently</u> research these potential crops and based on their research they will provide a recommendation that includes the following:

1. Rank the five species in order of priority for research and commercialization.
    a. Justify ranking with relative strengths and weaknesses
    b. If weaknesses are fatal flaws, please mention that.

2. Identify which species you would develop breeding programs for commercialization. For each crop, provide details on
    a. Germplasm acquisition
    b. Target market area
    c. Breeding Approach and Timeline to Commercial Products
    d. Breeding/Research Facility Locations and Needs

Each group will present their findings in a Powerpoint presentation to me (consider me as the company's technical advisor who is hired to sort out the myths/realities from what you present) That one hour meeting will be scheduled as soon as your group is ready but BEFORE the Final Exam. When making these decisions, there are numerous factors to consider, but at a minimum, there are four basic areas that must be addressed.

1. Basic Biology of the Species
    a. Relative Strengths of the Species in Consideration to Commercialization and Utilization
        i. Biological
        ii. Agronomic
        iii. Quality
    b. Relative Weaknesses of the Species in Consideration to Commercialization and Utilization
        i. Biological
        ii. Agronomic
        iii. Quality
    c. Where are the Opportunities for Improvement
        i. Short Term
        ii. Long Term
    d. Where are the Threats to Long Term Deployment and Production of this Species
    e. Potential use and Application of Molecular Genetic Technology

        i. Benefits
        ii. Problems

2. Potential End Uses, Products, Customers and Target Production Areas
    a. Economics of Production and Utilization
    b. Logistics of Marketing potential Releases
    c. Potential Acreage Devoted to a Crop
    d. Important Traits to Customers

3. Breeding Approaches
    a. Types of Releases
    b. Acquisition of Germplasm
    c. Availability/Suitability of Biotechnology (are there resources in the crop)
    d. Priority Traits
    e. Breeding Program
        i. Selection Nurseries and Locations
        ii. Evaluation Sites and Locations
    f. Seed Production and Scale UP
        i. Locations
        ii. Processing

4. Setting Up and Equipping Breeding Stations
    a. Location
    b. Equipment Needed
    c. Satellite Locations
    d. Personnel Needed

A N A L Y S I S O F V A R I A N C E

03/23/2005 Analysis of a simple 5 x 5 lattice

Dependent variable: YIELD1

Source	df	SS	MS	F-value	Pr> F
Total	49	2167.209			
BLOC	1	198.802	198.802	9.90	0.0137
ENTRY [unadj.]	24	1537.535	64.064		
Block [adj.]	8	160.607	20.076		
Intrablock error	16	270.265	16.892		
ENTRY [adj.]	24	1341.442	55.893	3.31	0.0082

Grand mean = 20.886 R-squared = 0.8753 C.V. = 19.68%

Relative efficiency to a RCBD = 100.9%
The S.E.D. between entries in the same block = 4.1746
The S.E.D. between entries in different blocks = 4.2383
[Analyzed as a partially balanced lattice design, mu= 0.0317]
[Analyzed with 1 repetitions of the basic design]

LSD for ENTRY [adj.] = 7.3627 S.E.D. = 4.2172 Heritability = 0.517
t (1-sided a=0.050, 16 df) = 1.7459 MSE = 17.78466

Level	Averages --- Y ---	Cv		Rank	
24s	33.76	0.0	qr	1	ENTRY-24
17	28.43	1.8	r	2	ENTRY-17
4	26.73	20.0		3	ENTRY- 4
18	26.33	18.4		4	ENTRY-18
23	25.44	15.1		5	ENTRY-23
20	25.32	32.2		6	ENTRY-20
16	24.13	9.0		7	ENTRY-16
14	23.70	14.2		8	ENTRY-14
9	22.53	61.1		9	ENTRY- 9
19	22.15	26.4		10	ENTRY-19
1q	21.81	9.5		11	ENTRY- 1
2	21.79	10.3		12	ENTRY- 2
15	21.79	17.7		13	ENTRY-15
3	21.57	9.2		14	ENTRY- 3
25	20.36	3.4		15	ENTRY-25
10	19.96	36.4		16	ENTRY-10
12r	19.76	14.4		17	ENTRY-12
22	17.08	28.8		18	ENTRY-22
5	17.07	15.7		19	ENTRY- 5
11	16.91	5.6		20	ENTRY-11
13	16.78	45.3		21	ENTRY-13
8	14.56	44.5		22	ENTRY- 8
6	12.33	37.1		23	ENTRY- 6
21	11.29	13.9		24	ENTRY-21
7	10.57	34.4		25	ENTRY- 7

Note: Means followed by a letter (q,r,...) differ, by a 1-sided
LSD, from the means of check entries denoted by the same letter

PROC ALS: Execution Time = 0.002 minutes, Kb used = 194.47
C:\AGRO99\DEMO\DEM5BY5.DBF, Kb Free = 36793.0, Wednesday, March 23 2005.

A N A L Y S I S O F V A R I A N C E

03/23/2005 Analysis of a simple 5 x 5 lattice

Dependent variable: YIELD2

Source	df	SS	MS	F-value	Pr> F
Total	49	6516.818			
BLOC	1	3.031	3.031	0.02	0.8940
ENTRY [unadj.]	24	4278.788	178.283		
Block [adj.]	8	1281.515	160.189		
Intrablock error	16	953.485	59.593		
ENTRY [adj.]	24	3743.344	155.973	2.62	0.0253

Grand mean = 56.914 R-squared = 0.8537 C.V. = 13.56%

Relative efficiency to a RCBD = 129.2%
The S.E.D. between entries in the same block = 8.1901
The S.E.D. between entries in different blocks = 8.6349
[Analyzed as a partially balanced lattice design, mu= 0.1256]
[Analyzed with 1 repetitions of the basic design]

LSD for ENTRY [adj.] = 14.8212 S.E.D. = 8.4892 Heritability = 0.368
t (1-sided a=0.050, 16 df) = 1.7459 MSE = 72.06726

ENTRY Level	Averages --- Y ---	Cv		Rank
25	77.11	18.4	q	1 ENTRY-25
16	73.31	14.1	q	2 ENTRY-16
24s	68.10	7.1	q	3 ENTRY-24
12r	67.93	3.4	q	4 ENTRY-12
6	67.88	32.6	q	5 ENTRY- 6
4	66.67	10.4	q	6 ENTRY- 4
15	63.77	14.8	q	7 ENTRY-15
20	59.15	12.1		8 ENTRY-20
8	56.68	11.5		9 ENTRY- 8
2	56.49	0.0		10 ENTRY- 2
18	55.46	24.9		11 ENTRY-18
3	55.24	0.0		12 ENTRY- 3
13	54.98	33.3		13 ENTRY-13
7	54.58	4.0		14 ENTRY- 7
22	54.57	12.9		15 ENTRY-22
10	53.72	8.4		16 ENTRY-10
14	53.16	13.7		17 ENTRY-14
19	51.88	9.3		18 ENTRY-19
5	50.63	0.0		19 ENTRY- 5
17	50.01	19.0		20 ENTRY-17
23	48.32	19.0		21 ENTRY-23
9	48.11	9.3		22 ENTRY- 9
1q	47.69	35.7		23 ENTRY- 1
11	44.53	18.5		24 ENTRY-11
21	42.87	12.9		25 ENTRY-21

Note: Means followed by a letter (q,r,...) differ, by a 1-sided
LSD, from the means of check entries denoted by the same letter

PROC ALS: Execution Time = 0.002 minutes, Kb used = 193.00

C:\AGRO99\DEMO\DEM5BY5.DBF, Kb Free = 36793.0, Wednesday, March 23 2005.

YR	LOC	LOC_CODE	EXPT	PLOT	CHECK	BLOC	IBLK	ENTRY	ID	NAME	PEDIGREE
93	1	SN	EXPT-1	1	1	1	1	1	B880031	ENTRY- 1	PEDIGREE- 1
93	1	SN	EXPT-1	2		1	1	2	B880032	ENTRY- 2	PEDIGREE- 2
93	1	SN	EXPT-1	3		1	1	3	B880033	ENTRY- 3	PEDIGREE- 3
93	1	SN	EXPT-1	4		1	1	4	B880034	ENTRY- 4	PEDIGREE- 4
93	1	SN	EXPT-1	5		1	1	5	B880036	ENTRY- 5	PEDIGREE- 5
93	1	SN	EXPT-1	6		1	2	6	B880037	ENTRY- 6	PEDIGREE- 6
93	1	SN	EXPT-1	7		1	2	7	B880038	ENTRY- 7	PEDIGREE- 7
93	1	SN	EXPT-1	8		1	2	8	B880039	ENTRY- 8	PEDIGREE- 8
93	1	SN	EXPT-1	9		1	2	9	B880040	ENTRY- 9	PEDIGREE- 9
93	1	SN	EXPT-1	10		1	2	10	B880046	ENTRY-10	PEDIGREE-10
93	1	SN	EXPT-1	11		1	3	11	B880047	ENTRY-11	PEDIGREE-11
93	1	SN	EXPT-1	12	2	1	3	12	B870011	ENTRY-12	PEDIGREE-12
93	1	SN	EXPT-1	13		1	3	13	B880050	ENTRY-13	PEDIGREE-13
93	1	SN	EXPT-1	14		1	3	14	B880051	ENTRY-14	PEDIGREE-14
93	1	SN	EXPT-1	15		1	3	15	B880053	ENTRY-15	PEDIGREE-15
93	1	SN	EXPT-1	16		1	4	16	B880054	ENTRY-16	PEDIGREE-16
93	1	SN	EXPT-1	17		1	4	17	B880055	ENTRY-17	PEDIGREE-17
93	1	SN	EXPT-1	18		1	4	18	B880056	ENTRY-18	PEDIGREE-18
93	1	SN	EXPT-1	19		1	4	19	B880057	ENTRY-19	PEDIGREE-19
93	1	SN	EXPT-1	20		1	4	20	B880058	ENTRY-20	PEDIGREE-20
93	1	SN	EXPT-1	21		1	5	21	B880060	ENTRY-21	PEDIGREE-21
93	1	SN	EXPT-1	22		1	5	22	B880062	ENTRY-22	PEDIGREE-22
93	1	SN	EXPT-1	23		1	5	23	B870010	ENTRY-23	PEDIGREE-23
93	1	SN	EXPT-1	24	3	1	5	24	B870008	ENTRY-24	PEDIGREE-24
93	1	SN	EXPT-1	25		1	5	25	B870007	ENTRY-25	PEDIGREE-25
93	1	SN	EXPT-1	26		2	6	25	B870007	ENTRY-25	PEDIGREE-25
93	1	SN	EXPT-1	27		2	6	20	B880058	ENTRY-20	PEDIGREE-20
93	1	SN	EXPT-1	28		2	6	15	B880053	ENTRY-15	PEDIGREE-15
93	1	SN	EXPT-1	29		2	6	10	B880046	ENTRY-10	PEDIGREE-10
93	1	SN	EXPT-1	30		2	6	5	B880036	ENTRY- 5	PEDIGREE- 5
93	1	SN	EXPT-1	31		2	7	4	B880034	ENTRY- 4	PEDIGREE- 4
93	1	SN	EXPT-1	32		2	7	9	B880040	ENTRY- 9	PEDIGREE- 9
93	1	SN	EXPT-1	33		2	7	14	B880051	ENTRY-14	PEDIGREE-14
93	1	SN	EXPT-1	34		2	7	19	B880057	ENTRY-19	PEDIGREE-19
93	1	SN	EXPT-1	35	3	2	7	24	B870008	ENTRY-24	PEDIGREE-24
93	1	SN	EXPT-1	36		2	8	23	B870010	ENTRY-23	PEDIGREE-23
93	1	SN	EXPT-1	37		2	8	18	B880056	ENTRY-18	PEDIGREE-18
93	1	SN	EXPT-1	38		2	8	13	B880050	ENTRY-13	PEDIGREE-13
93	1	SN	EXPT-1	39		2	8	8	B880039	ENTRY- 8	PEDIGREE- 8
93	1	SN	EXPT-1	40		2	8	3	B880033	ENTRY- 3	PEDIGREE- 3
93	1	SN	EXPT-1	41		2	9	2	B880032	ENTRY- 2	PEDIGREE- 2
93	1	SN	EXPT-1	42		2	9	7	B880038	ENTRY- 7	PEDIGREE- 7
93	1	SN	EXPT-1	43	2	2	9	12	B870011	ENTRY-12	PEDIGREE-12
93	1	SN	EXPT-1	44		2	9	17	B880055	ENTRY-17	PEDIGREE-17
93	1	SN	EXPT-1	45		2	9	22	B880062	ENTRY-22	PEDIGREE-22
93	1	SN	EXPT-1	46		2	10	21	B880060	ENTRY-21	PEDIGREE-21
93	1	SN	EXPT-1	47		2	10	16	B880054	ENTRY-16	PEDIGREE-16
93	1	SN	EXPT-1	48		2	10	11	B880047	ENTRY-11	PEDIGREE-11
93	1	SN	EXPT-1	49		2	10	6	B880037	ENTRY- 6	PEDIGREE- 6
93	1	SN	EXPT-1	50	1	2	10	1	B880031	ENTRY- 1	PEDIGREE- 1

SOURCE	S_NO	YIELD1	YIELD2
SOURCE- 1	31	20.17	55.81
SOURCE- 2	32	20.17	60.00
SOURCE- 3	33	20.33	60.00
SOURCE- 4	34	23.33	73.30
SOURCE- 5	36	19.17	53.30
SOURCE- 6	37	14.83	80.00
SOURCE- 7	38	7.67	60.00
SOURCE- 8	39	9.83	56.70
SOURCE- 9	40	12.83	53.30
SOURCE-10	46	14.67	60.00
SOURCE-11	47	17.33	43.30
SOURCE-12	0	21.67	66.70
SOURCE-13	50	11.50	43.30
SOURCE-14	51	21.67	46.70
SOURCE-15	53	19.17	70.00
SOURCE-16	54	22.17	73.30
SOURCE-17	55	28.50	43.30
SOURCE-18	56	22.83	46.70
SOURCE-19	57	18.17	53.30
SOURCE-20	58	19.50	53.30
SOURCE-21	60	10.13	40.00
SOURCE-22	62	13.67	50.00
SOURCE-23	0	28.50	56.70
SOURCE-24	0	34.33	63.30
SOURCE-25	0	20.17	66.70
SOURCE-25	0	21.17	86.70
SOURCE-20	58	31.00	63.30
SOURCE-15	53	24.67	56.70
SOURCE-10	46	24.83	53.30
SOURCE- 5	36	15.33	53.30
SOURCE- 4	34	31.00	63.30
SOURCE- 9	40	32.33	46.70
SOURCE-14	51	26.50	56.70
SOURCE-19	57	26.50	46.70
SOURCE-24	0	34.33	70.00
SOURCE-23	0	23.00	43.30
SOURCE-18	56	29.67	66.70
SOURCE-13	50	22.33	70.00
SOURCE- 8	39	18.87	66.70
SOURCE- 3	33	23.17	60.00
SOURCE- 2	32	23.33	60.00
SOURCE- 7	38	12.60	56.70
SOURCE-12	0	17.67	70.00
SOURCE-17	55	27.77	56.70
SOURCE-22	62	20.67	60.00
SOURCE-21	60	12.33	33.30
SOURCE-16	54	25.20	60.00
SOURCE-11	47	16.00	33.30
SOURCE- 6	37	8.67	50.00
SOURCE- 1	31	23.07	33.30

From: Bill Rooney
To: "Delroy Collins"
Date: Wednesday, November 04, 2009 3:31:00 PM
Attachments: DTR Nursery.pdf

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

Planted ~ 5/18

2009 Release/Distribution Observation - DTR (1 → 380)

CSfa 1→380, Lub 1→41

(1→110 in '09 house)

Plot No	Designation/Name	Pedigree	Source	
1	Tx 3301	82BDM 499 (SC173 * SC414)	08L Tx 3301⊕	DMH Res Releases (1-60)
2	3302	86PL 2120 ((SC748 * SC650) * SC414)	06L2⊕	
3	3303	95ED 509 /(86PL2120 * 87BH8606)-BD19	08L Tx 3303⊕	+ 08 × in 10 FQ
4	3304	(" ")-BD5	06L4⊕	
5	3305	82BDM 1982-4/(86PL2120 * 87EON366)-BD6	" 5⊕	
6	3306	90CW 8147 / (82BDM499 * ")-HF8	08L Tx 3306⊕	× in 10
7	3307	91BD 1319 / (Sureno * 82BDM499)-BD18	06L7⊕	
8	3308	90EON 328 /(" ")-HD5	8⊕	
9	3309	96CD 635 /(SRN39 * 90EON 328)-HF4	9⊕	
10	3310	98CD 187 /(87EO366 * ")-HF6	10⊕	
11	3311	96CD 677 /(" ")-HF3	08L 3112⊕	
12	3312	(SC173 * SC414)	06L-F105-Tx 3312⊕	× in 104
13	3313	(SC414 * TAM428)	06L13⊕	R+Bl gl; + R+Bl '08
14	3314	03L- B/R905 /(TAM428 * SC502)	08L 3114⊕	wch
15	3315	03L- B/R918 /(" ")	06L15⊕	w trsl
16	3316	(SC23 * QL3(I))	07L1906⊕	
17	3317	(R4317 * SC425)	06L17⊕	
18	3318	(Tx432 * SC38)	" 18⊕	
19	3319	(BTx625 * SC33)-BD5	07L2225⊕	
20	3320	(TP24R * SC33)-BD4	06L20⊕	
21	3321	(R4317 * SC418)	21⊕	
22	3322	(82BDM499 * SC574)-WE6	22⊕	
23	3323	(?? * Ethiop Dur Dac)	07L2227⊕	
24	3324	(SRN39 * 90EON 328)-HF3	06L24⊕	
25	3325	(87EON366 * 90EON328)-HF6-ED5	25⊕	
26	3326	(" * ")-HF6-ED6	26⊕	
27	3327	(87EON366 * 90EON328)-HD14-BD1	07L2228⊕	
28	3328	(" * ")-HD14-BD2	06L28⊕	
29	3329	(" * ")-LD30	29⊕	
30	3330	(" * ")-LD31	30⊕	
31	3331	(" * ")-HD8	31⊕	
32	3332	(" *(Sureno * BDM499))-HD40	32⊕	
33	3333	(" * Tx2891)-BD2	33⊕	round
34	3334	(Sureno * Tx2891)-HF17-BE5	34⊕	
35	3335	(" * 82BDM499)-HD9	35⊕	
36	3336	(" * ")-14B	36⊕	
37	3337	(Malisor 84-7 * 90EON 328)-HF14	37⊕	
38	3338	(" * ")-HF9	38⊕	
39	3339	(CE151 * BDM499)-LD17	39⊕	
40	3340	(90EON328 * CE151)-LD11	40⊕	
41	3341	(" * ")-BD15	41⊕	
42	3342	(" * ")-BD18	42⊕	
43	3343	(" * ")-LA37	08L 3115⊕	
44	3344	(" * ")-LA45	06L44⊕	comp tall
45	3345	(" * ")-LA49	08L 3116⊕	
46	3346	(" * ")-LA59	07L2229⊕	
47	3347	(86PL2120 * M50069)	06L47⊕	
48	3348	(88BE2668 * BDM499)-HD24	08L 3117⊕	
49	3349	(90EON 328 * Kuyuma)-BE7	06L49⊕	
50	3350⊕	(" * ICSV 1089BF)-BE9	50⊕	

Margin notes: 140 (beside 3); 220 (beside 6); 140 (beside 13)

1 x ~~to~~ WLR ⊕ 3/21

2009 Release/Distribution Obs - DTR (Continued) (2)

	Plot No	Designation/Name	Pedigree	Source		Omit Rel (Cont)
	51	Tx3351	(90EON328*90CC549)-BE6-BD2	06L51		
	52	3352	(" * ")-BE10-BD1	52		
160	53	3353	(BTx623*QL3(I))*BHF13)-HL3	53	B lines	+07 ok?
	54	3354	(" * ")* ")-HL7	54		
180	55	3355	(" * ")* ")-HL15	55	"	"
165	56	3356	((" * ")*(BTx643*B9501))-HL14	56	Red/light	" "
140	57	3357	((" * ")*(" * "))-HL30	57		" "
	58	3358	((" * ")*BHF14)-HL13--PR3	58	+AB	wk
	59	3359	((" * ")* ")-HL13--PR2	59	+AB	wk
	60	3360	((" * ")* ")-HL13--PR7	60	+AB	wk
	61	SC414-12E/IS2508 Der, BC3	CK/CK	Sudan 03L4020	Extra DM Res (61-110)	
	62	90EO328/Tx3308		06L8		
	63	Sureno		06L61		
.06L	64	95ED508	(86PL2120*87BH8606)-BD19 like 509	08LoDTR 84 opll	6L265	
	65	92BD1016	(R5647*(SC414*SC326-6))	08BE 87 opll	6L266	
36	66		((BTx623*QL3(I))*BHF13)-HL14-BD2 (B-line)	06L273	+80D(110) v/long ?, odd hd ?	
15	67		(TAM428*SC502) 03B/R 906	274	108 ? wk, no ?	
	68		X-CC BRON221-1-[illegible]CD3	278	+Dt	+08?
	69		(90EO328*CE151)-LA42	280	vg	"
	70		(" * ")-LA36	282	vg	"
	71		((BTx623*QL3(I))*((B1*B9501))/BON125)-HL14-BD3-BD1-CD2	283		B Line
	72		(Sureno*Tx2891)-HF17-BE5	08LoDTRBr 109 opll	See #72 See 34	~~+08~~
	73		(WSV387*(CE151*BDM499)-LD17)-LA1--LB/R968-CD5	8BE 110 opll	See 88, 108, 109	
	74		(90EON328*90CC549)-BE16--BD3	08LoDTRBr 112 opll	+WR See 94/88	297
	75		(BDM499*87EON366)-HF31--CD3-BD2	" 115 opll	5BD	2269
	76		(98CD192*Kuyuma)-BE1-BD3--	08BE 117 opll	6EE	1246
	77		(SRN39*90EON328)-HF44	" 120 opll		1270
	78		(90EON328*CE151)-LD11-BD4	08LoDTRBr 121 opll	* 1DM but nice '08	1271
	79		(" ")-BD6-BD2	" 122 opll	GWR	1272
	80		(" *(S35*ICSV401)-1-3/ 7IOB179	08BE 123 opll	See best sh of Ped 91, 92, 100	12706 SAD
	81		(98CD192*Kuyuma)-BE3-BD2-HD1	124 opll		1277
85	82 (3plH)		(90EON328*98CA4598)(EO361*EO343)-BE18	126 opll Rtn	* GWO 34/0/??	1279 See 10. 3pl LL
	83		(" *Kuyuma)-BE17-HD1-BD1	127 opll		1282
	84		(96CD635*Macia)-HF14	08LoDTRBr 128 opll	6L300	
133	85		(" *99GWD92)-HF5-HD1-BD2	" 129 opll	WR	1284
	86		(" * ")-HF56-HD1-BD1	08BE 130 opll		1287
	87		(" *Macia)-HF15-HD1-BD2	08LoDTRBr 133 opll	07L2026	1295
	88		(WSV387*(CE151*BD499)-LD17)-LA1-LB/R968-CD2	135 opll	? See 73, 108, 109 4BD	1178
	89		(90EON328*90CC549)-BE6-	138 opll	GWO	5BD 2308
78	90		(" * ")-BE16	139 opll	(sh pl) other For WR 2309	other entries not have ?
	91		(" *(S35*ICSV401)-1-3/7IOB179)-BE7	08BE 142 opll	See 2326	
	92 (LL2.0)		(" *(" * ")-1-3/ ")-BE9	143 opll	* LL2.0	2327
22	93		(" *CE151)-LD11	144 opll 2HS	See 28+40	2329
75	94		(" *90CC549)-BE16--BD4	08LoDTRBr 146 opll	(sh pl) See 74+90	2349
	95		(96CD635*90EON343)-HF12-BD2-BD1	08BE 151 opll	? no ? GWR '08BE	2366
	96		(90EON328*ICSV1089BF)-HF28	08LoDTRA 154 opll	nice '08	2415
	97		(87EON366*CE151)-HD30	" 156 opll		2429 AdvGe.
7	98		(" *90EON328)-HF6	08BE 157 opll	sh 187	2431
	99		(LG70* ")-BD, 47	" 159 opl	wk	2468
	100		(90EON328*(S35*ICSV401)-1-3/7IOB179)--BE7----HD1	08LoDTRBr 161 opll	See 80, 91, 92 others (2HS)	2476

X. = In '09 Lu Inc

2009 DTR Release/Dist. Obs (Cont)

3

	Plot No	Desig/Name	Pedigree	Source		Other
	101		(90EDN 328 * 90CC 549) -BE10	08L DTRB 162	opll Sec 52	058024 88
	102		(" * 98CA 4598 (ED361 * ED343)) -BE18	↓ 163	opll Sec 82	25 01
67	03		(96CD635 * 90EDN343) -HD10	08BE 165	opll wh, er ls, long hds	25 18
	04		(" * Macia) -HF2	08L DTRB 169	opll	25 57
	105		(" * ") -HF10	" 170	opll	25 58
	06		(90EDN 328 * (ED361 * ED343)) -HF 27	08BE 171	opll wh	25 72
82	07		(86EDN635 * Macia) -HF13	08L DTRB 172	opll	25 96
	08		(WSV387 * (CE151 * BDM499) -LD1) -LA1 ----- LB1	" 176	opll lg seed best one 08 ← Sec 88,73	26 08
30	09		(" * (" ") - ") - " ---- LB3	08BE 177	opll shorter lg awn	26 14
	110	96CD192-4	Sis of 98CD187/(87EDN366 * 90EDN 328)	06L 275 ⊕		
40	11	Tx430		08L WR 201 ⊕	WReck GM/WR Rel 111-160	
14	12	Tx2536		202 ⊕		
	13	SC170-6-17		↓ 203 ⊕	(+WR)	
	14	Sureno		06L 61 ⊕	↓	Repeat
	115	Tx 3361	90EDN 343/(Tx 2895 * (SC170 * MR4-4671))	" 62 ⊕		WThr Res/GM/Release
	16	3362	99GWD 92/(86EDN361 * 90EDN343)	08L 3111 ⊕		
-90	17	3363	80B2892/(SC748-5 * SC630-11E)	07L 1957 ⊕	7L2230	
90	18	3364	88BH8606-6/(Tx433 * (SC748-5 * SC630-11E))	08L WR 208 ⊕		+08 Inc, 50
	19	3365	TP4-?-5/sh3 TP4 Pop Deriv	07L 1959 ⊕		
	120	3366	R4317/(SC170-6-17 * MR4-4671) LEC	06L 68 ⊕		
	21	3367	R6078/(" ") -HL15	07L 1961 ⊕		
	22	3368	R6078TM/(" ") - " /TM	06L 70 ⊕		
	23	3369	92BE6335/(Tx2891 * R4317) -BD1	71 ⊕		
	24	3370	97BR030/(R4317 * SC748-5) -C2	87 ⊕		
	125	3371	(Sureno * (SC170 * MR4-4671)) -HD7	95 ⊕		
	26	3372	90L19178/(M84-7 * VG153) -LBK-PR7	72 ⊕		
	27	3373	90L19037/(" ") -L6-LBK	75 ⊕		
	28	3374	90CC549/(Sureno * VG153) -HF41	73 ⊕		
	29	3375	D.ff 19178/(M84-7 * VG153) -LBK-PR7	76 ⊕		
	130	3376	(VG153 * (TAM428 * SBIII) -23) -BE2	77 ⊕		
	31	3377	00CA4051/(M84-7 * 88BH8606) -BE4	80 ⊕		
	32	3378	96CA5986/(Sureno * 87EDN366) -CW3	78 ⊕		
	33	3379	00CA4879/(87EDN366 * (CS3541 * SC630))	79 ⊕		
	34	3380	01BD5546/(87EDN366 * (M84-7 * Sureno) -Tx2) BE7	81 ⊕		
	135	3381	(CE151 * LG70) -LA10	↓ 82 ⊕		
	36	3382	89B5544/(SC719 * SC650)	07L 1976 ⊕		
	37	3383	5CA1765/(BTx643 * SC650-11E)	06L 83 ⊕		
	38	3384	(Tx2907 * 90EDN 343) -HL15	" 93 ⊕		
	39	3385	(86EDN361 * 88BH8606-6) -HL13	07L 1979 ⊕		
	140	3386	(ICSV1089BF * Macia) -HF2	06L 88 ⊕		
	41	3387	(Macia * Sureno) -HF11	" 89 ⊕		
	42	3388	(" * ") -HF9	07L 1982 ⊕		
	43	3389	(Sureno * Kuyuma) -BE32	06L 91 ⊕		
	44	3390	(ICSV400 * 90L19178) -HF22	07L 1984 ⊕		
	145	3391	(90EDN328 (Tx3308) * 90CC549) -BE16	" 1985 ⊕		
	46	3392	(86EDN361 * 90CC549) -HF25	1986 ⊕		
	47	3393	(90EDN328 * (86EDN361 * 90EDN 343)) -BE18	1987 ⊕		
	48	3394	(" * (" * ")) -BE19	1988 ⊕		
	49	3395	(Dorado * (86EDN361 * 90EDN 343)) -HF46	1989 ⊕		
	150	↓ 3396	(90EDN 328 * ICSV1089BF) -BE9	↓ 1990 ⊕	Sis of Plot 50 ↓	

2009 DTR Release/Dist. Obs (Cont.)

Plot No	Desig/Name	Pedigree		Source			
151	Tx 3397	(90EON 328 * Kuyuma) -HF27		07L 1991®			"
152	3398	(98CD192 * ") -BE1		1992®	PWR '08 -[illegible]		Sis of [illegible]
153	3399	(B.DLO 357 * B.LD 6 wx) -BD24		1993®	R, [illegible]	B*	
154	3400	(B.HL9 * B.DLO 357) -BE3		1994®		B*	
155	3401	SC748-5 / IS 3552 BC1		06L 65®			
156	3402	SC 630-11E(II) / IS 1269 BC3		" 85®		B	
157	3403	SC 650-11E(t) / IS 2868 BC3		08L 3092®		B	
158	3404	VG 153 / (Wal-1 * IS 9327-1) / M62676		06L 74®			
159	3405	ICSV 1089BF / ICRISAT Line		98®			
160	Sureno			61®	WR CK		Repeat
161	Tx 3308 / 90EON 328	(Sureno * 82BDM499) -HD5		06L 8®	WA SABN, etc	Integr.	SAB (Repeat)
62	86EON 361	(R5646 * SC 326-6)		08L SABN 105®	WA - Dis Res		
63	86EON 362	(R5646 * SC 326-6) Sis of ED 361		06L 149®	"	"	
64	86 EON 374	((Tx 432 * CS 3541) * SC326-6)		" 150®	"	"	
165	87 EON 366 sis	(TAM 428 * (Tx 432 * CS 3541))		08L SABN 106®	"		
66	86EON 361 (TM)	(R5646 * SC 326-6) TM		07L 2034®	TM of 86ED 361		
67	91BE 7414	(Tx 436 * (R5646 * SC 326-6))		06L 122®	WA		
68	SC 326-6	IS 3758 der (BC1)		08L SABN 181®	" - Dust. Dis Res, Rust, Anth, [illegible]		
69	R4244	(SC 326 * SC103)		06L 127®	"	R, HC = 289	
170		(86ED361 * 88BE2668) -LL2		08L 3119®	"		
71		R2241 * (R5646 * SC326-6)) -HD25		07L 2045®			
72	CE151-262-A1	Improved Cultivar	Senegal	08L SABN 108®	WA		Pre, Post
73	Macia	Improved Cultivar	Mozambique	06L 180®	" + Botswana		Pre
74	Kuyuma	" "	Zambia	07L 2080®			
175	Sureno		TAMU / Honduras	06L 61®		Repeat (3)	
76		(Sureno * SRN39) -HD5		08L-SABN 175®			
77		(" ") -BE1		08L 3096®		From 6L 148	
78		(" ") -BE1		" 3097®		From 4L SABN 1014	
79		(Sureno * Kuyuma) -BE32		07L 2021®	(Sec Tx 3389) - [illegible]		
180		(" ") -BE21		2070®			
81		(Macia * Sureno) -HF19		2065®			
82		(Sureno * CE151) -BE25		2068®			
83		(SRN39 * MB108B) -HD5		2036®			
84		(87EO366 * WSV387) -HD27		2041®			
185		(" ") -HF3		2042®			
86		(" ") -HF14		2043®			
87		(" * TAM 428) -HF2		2050®		round	
88		(" * Macia) -HD39		2044®			
89		(90EON 328 * CE151) -LD11-BD4		2051®			
190		(" ") -LD13		2052®			
91		(CE151 * MP531) -LD42		2053®		[illegible]	
92		(" * Macia) -BE14		2055®			
93		(" ") -AD5-BE40		2060®			
94		(" ") -LD3		2067®			
195		(" ") -LD8		2071®			
96		(" ") -HD15		8L SABN 163®			
97		((TAM 428 * SV1) * CE151) -LA3		07L 2066®		Sm seed	
98		(CE151 * MP531) -LD47		8L SABN 176®			
99		(" ") -BE5		7L 2020®			
200		(90EON 328 * CE151) -BD35		2006®			

2009 DTR Release/Dist. Obs (Cont)

Plot No	Desig/Name	Pedigree	Source	Intern SABN Confirmed
201		(Sureno * ICSV400)-BE13	7L 2022⊗	f sm
02		((87E0366 * WSV387)-HD19 * CE151)-BD18	2049⊗	
03		(Macia * Dorado)-HD2-CA1	2056⊗	
04		(" ")-LL2	2057⊗	
205		(" ")-LL7	2058⊗	
06		(" ")-HD2---CA3	2059⊗	
07		(" ")-HD4	2061⊗	
08		(" ")-HD12	2003⊗	
09		(Macia * TAM428)-LL7	2062⊗	
210		(" ")-LL9	2063⊗	
11		(" ")-LL14	2064⊗	
12		(ICSV1089BF * Macia)-HF9	2046⊗	
13		(" ")-HF112	2047⊗	
120 14		(" ")-HF9	06L290⊗	
215		(96CD635/Tx3309(SRN39*90E0328)*Macia)-HF15	07L 2026⊗	
16		(" " ")-HF16	2016⊗	
17		(" " ")-HF30	2015⊗	
18		(Sureno * CE151)-?	08L 3095⊗	
19		(WSV387*((CE151 * BDM499)-HD17)-LA1/LB R968	07L 2007⊗	pr-lg, pr turtle
220		(" " -HD17)-LA1-BD1-BD2	2017⊗	
21		(98CD192(E0366*E0328)-HF6 * Kuyama)-BE1(sh)	2011⊗	
22		(" " " ")-BE1(t)	2012⊗	
23		(" " " ")-BE3	2013⊗	
24		(90E0328 * 90CC549(Sureno * VG153))-BE16	2008⊗	
225		(" " ")-HF68	2018⊗	
26		(" " ")-BE16	2023⊗	f small
27		(90E0328 * ICSV 1089BF)-BE9	2009⊗	
28		(" ")-HF26	2024⊗	v turtle
29		(" * Kuyuma)-HF27	2010⊗	
230		(" * ")-BE17	8L SABN 122⊗	
31		(" * Dorado)-HF30	07L 2019⊗	
32		(" *(S35 * ICSV401)-1-3/7IDB179)-BE1	2025⊗	
33		(TAM428 * M62641), 2 dw, Ryl, 93 Kollo, Niger	06L 296⊗	
34	ZSV15	Improved Cultivar — Zambia	7L 2032⊗	
35	RCV	" " — El Salvador	2037⊗	
36	Pinolero I	" " — Nicaragua	2038⊗	
37	INTA Ligero	" " — "	2040⊗	
38	INTA LP-99	" " — "	2077⊗	v lg, turtle
39	INTA 108	(Tortillero * Pinolero I) — "	2039⊗	
240	INTA F5	(" ") — "	2076⊗	END SABN
41	Tx3301/BDM499	(SC173 * SC414)	08L Tx3301⊗	Overall Dt, Dt Res + DM (Rqued)
42	1790E	(SC56 * SC33)	6L136⊗	Pre + Post, LDG (W+S)
50 43	R9188	SC599-6 deriv (BC1)	135⊗	Post
✓ 44	R1565	(SC56 *)	138⊗	" , LD(STW)
✓ 245	R1922	(SC56 *)	139⊗	" " "
✓ 46	R1584	(SC56 *)	140⊗	" " "
much 160 47	(P407 * ?) 559uc	SC33 outcross der	144⊗	Post, LDG (")
48	SC414-12E	/IS2508 deriv, BC3 CK/CK — Sudan	03L 4020⊗	DM, WA,
49	SC56-14E/IS12568C	CNig/C.Nig — Sudan	6L 133⊗	Post, LDG, stalk, WN
250	SC35-14E/IS12555C	D/D — Ethiopia	03L 4312⊗	Post, LDG, WN, stalk; +08 Inc
	FHB, WN			

2009 DTR Released/Dist. Obs (Cont.)

Plot No	Desig/Name	Pedigree		Source			DTRes (Cont)
251	SC265-14E / IS 6705C	G/G	Burkina Faso	3L4319		smut	Pre+Post
52	SC23-14E / IS 12543C	D/D	Ethiopia	03L-020438			" "
53	SC701-14E / IS 3462C	C/C	Sudan	↓ 295			Overall Dt
54	SC1017-14E / IS 11549C	DB/	Ethiopia	529			Pre+Post
255	SC1154-14E / IS 11814C	DB/	"	23			" "
56	SC1211-11E-3 / Cacho de Chevo	der. (BC3)	Guatemala	06L 114		round	Pre
57		(Tx436 * Cigarde de Panama)-EW-EC437-1		↓ 115			Pre
58	Ajabsido	Local Cultivar C/C (Feterita)	Sudan	02L5348			Pre (Outstanding
59	Segaolane	" " K/K (Kafir)	Botswana	↓ 5351			Pre
260	El Mota	" " C/C	Niger	03L4298			Pre
61	Macia	Improved Cultivar	Mozambique	6L 180			Pre (Repeat), Poor Post +0.83
62	CSM 63	Malian Guinea Cultivar	Mali	03L4306			Pre
63	SS130	Local Cultivar D/D	Somalia	01L3434			Pre
64	CE151-262-A1	ZZ Deriv, Senegal Deep	Senegal	08LSABN 108			dupl Pre, Poor Post
265	P954035	SC33der/IS12553C	Purdue/TAM	03L4308			Pre+Post
66	P898012	Local Cultivar, Feterita	?/Purdue	↓ 4314			Pre+Post
67	KS19		KSU	01L1371			Post
68	BQL41		QDPI	04L7222			Post, Bline
69	NSA440	Karper/Kafir Der	Karper Line	6L 102			SG, LDG (STW)
270	NSA681	Karper Line	" "	8L3088			" " " "
71	Karper 669	" " YE	" "	8L3089			Dt/Sudan, Australia
72	NSA817	" " YE	" "	6L105			LDG
73	NSA837-1	" " YE	" "	106			LDG
74	P37-3	(Tx2794 * K22/35)		124		Pre	Pur Rel (Sec 375-438
275	88BE2668	(Tx2783 * (SC748 * SC630))		121		Good ↗	
76	R3224 (sh)	(TAM428 * (GbTx7000der))		119			LDG
77	R3224 (t)	" "		120			LDG
78	88V1080	(Tx430 * R9188)		↓ 108			SG (Post), no Pre
79		(Tx430 * R6078)-?-HL2		02L5516		Overall Dt	5DLT140
280		" " " LEC		6L 111			
81		(Tx430 * R6933)		112			
82	88V2084	(Tx2536 * R1177)		109			
83	89CC132	(Tx430 * R6078)		110			
84	88B1016	(Tx430 * Rio)-15		107		SG (Post)	FRM
285		((C.Shelly * Rio) * SC599-11E)-BE7		113		Post	"
86		(Tx430 * B35)-C3-B1/92B2029		05L4334		Post	"
87	90B2662	(SC719-11E * SC630-11E)		03L4283		WR	WLR/FRM
88	SC103-12E	IS2403 der. BC3 Caud	Bn, UC	02L5385		Wide Hd, ↑ of Bn High	
89	R4244	(SC326-6 * SC103)	" "		06L127		Repeat
290	90EO362-4				06L158		
91		(86PL2120 * BH8606)-BD16/ED508		D3CA956	opk	Some Post, Ldg Rx	
92		(SC56-14 * EO361)-HE1 (no UC)		06L131		Some Post	"
93		" " -HE1 (UC)-B1		03CA1442	43 opk	" "	" 5DLT150
94		" " -HE1 (UC)-B3		03B/R777		" "	" 5DLT151
295		(Tx436 (Tx7078 * 1790E))	02CS4495/91CW3649	04L B/R68		" + Pre	DLT 141
96		" " ")-622-1		06L117		" " + "	
97		" " ")/RGH/PD105		" 118		End Straight Dt	
98	86EON361	(R5646 * SC326-6)		08LSABN105		Dis, Misc	(298-320 Repeat
99	87EON366sis	(TAM428 * (Tx432 * CS3541))		" 106			"
300		(86EO361 * 88BE2668)-LL2			07L2048		

2009 DTR Release/Dist. Obs (Cont)

P/of No	Desig/Name	Pedigree	Source
301	89CC443	(Tx430 * LASON68)	OSL-SABN 186 (See 390)
02		(EO361 * 88BE2668) - CS228-1	~~6L 164~~ 04B/R157 (6L164 missing)
03		(Macia * 88BE2668) - HD9	6L 165 ; = visit
04		(EO361 * Tx2783) / 4625 / - HL5	169
305		(EO362 * ") = / OSCH 4205	170
06		(EO361 * ") / CA4631 / - HL2	172
07	R5646	(Tx432 * CS3541)	OSLSABN 184
08	91CC515	(Tx436 * R3338 - nx) non wxy	6L 157
09	SC326-6	IS3758 der	OSLSABN 181 Oust Dist Res, Rust, Auth, K. Bldg
310	R1880		6L 160 LF Dis Res
11	R6956	(SC326-6 * SC103)	128 WA - Dis Res
12	R3338 wx		151 ppl, wxy
13	850G4300-5	(GBTx430 der * (SC170 * MR4467)) Homo wxy	154 HYld
14		(SC326 * SC103) - 77 - B1	129 R, Pg no uc
315		(EO361 * (TnGbRes Wxx * (SC170 * 4671))) - HE25	6L 178 Homo wxy
16	TnGbRes Wxx	JCS Pop.	" 123 Gb adult pet fol wxy DT (Pr
17		7L9503 / R Homo	6L 159 Some GM per R
18		(R6078 * R898012)	6L 126 Overall DT wy, ch, uc
19	95CW5045	(Malisor 84-7 * EO361) (CW 95A5045) - LE25	8LSABN 187 Dis Res BL-3027?
320	SC38-14E	IS12558 D/D Ethiopia	03L-CHO 4455 Misc Post, Ldg Res DT
21	BTx642	B35 / IS12555 dw / B35-6 / BC1	6L 181 A/B Lines SG, WN, Stalk, wxy Plow pre
22	BTx643	B1 / (BTx625 * B35) - HL19 - HL9	183 Post (recessive) - Ldg Res (stw
23	BTx644	B803 / (BTx3042 * (BTx625 * B35)	184 Pre
24	BTx645	B807 / (BTx623 * (" ")	185 Pre
325	B2-2(B)	(BTx625 * B35)	188 + Ldg Res (stw)
26	B2-1	(" ")	186 Post " "
27	B402	(BTx3042 * (BTx625 * B35))	189 Post " "
28	B403	(" * (" "))	190 Post " "
29	B407		207
330	B409	(B1 * B9501)	191 Some Post, Ldg Res (stw)
31	B4R	(B406 * R10)	204 Post, " " "
32	B DLD357	(B1 * B9501)	8LSABN 189 " " "
33	B HF88	(" * ")	6L 193 Pre " "
34	B PDLT157	(" * ")	192 S. Post " "
335	B HF14	(BTx643 * BTx635) (Good HS m Res)	8LSABN 190 W stm, Some Tans Post, Ldg Res
36	B HF8	(" * ")	6L 220 " " " "
37	B HF4(3)	(BTx635 * B4)	222 " " " "
38	B HF4(sh)	(" * ")	223 " " " "
39	B HF25	(" * ")	224 " H Yld, no Post
340	B.V57	(BTx643 * BTx635)	240 " Some Post
41	B.V78	(" * ")	239 " " "
42	TP25 wx	TP25 Pop. Deriv	231 " wxy ends
43	B.BE8	(B.HF14 * (B1 * B9501))	232 "
44	B.LD6 wx	(B.BON34 * B9502) wxy	225 " wxy
345	B.LD6 nwx	(" * ") non wxy	226 " non wxy
46	B.LD10 wx	(" * ") wxy	227 " wxy
47	B. HD8(W)	(BTx630 * B9502) wxy (W)	229 " "
48	B. HD8(R)	(" ") wxy (R)	228 R stm "
49		(M90950 * BTx635) - BE3	238 W stm
350	B. BE1 (W)	(B.HF14 * B.DLD357) (Gd HS m Res)	235 "

B.BON34 = BTx Arg 1

B9501 = (B7904 * (SC748 * SC630)) B7904 = Sister of BTx629

B9502 = (BTx3042 * (BTx625 * B35))

B9503

	Plot No	Desig/Name	Pedigree		Source	
2" mat ht 1	351	B.BE1 (R)	(B.HF14 * B.DL0357)	H.Sm Res	6L 236 ⊕	R, tn, tans (Cnt) Some Post
140	52	B.BE4	(B.V78 * B402)		237 ⊕	" R, tn " "
160	53	B.HD9	(B35 * B9501)-HD9		202 ⊕	" " "
	54	B.V3	(B35 * B9503)-V3		201 ⊕	Med, Purp
	355	B.V10	(B1 * B9501)-V10		195 ⊕	R, Purp Some Post, Ldg Res(s
	56	B.V60	(" ")-V60		196 ⊕	
	57	B.LD2	(B35 * B402)-LD2		200 ⊕	
	58	B.DLT125	(B1 * B9501)-DLT 125		199 ⊕	
180	59	B8	(BTx624 * B599-6)		205 ⊕	W, Bold Pre
	360		(B1 * B9501)-6PD111		197 ⊕	
130	61		(" ")-LEC??-CA		253 ⊕	
170	62		(" ")-HL??-HL2		254 ⊕	
	63		(" ")-HL?-HL2/CA4		244 ⊕	
	64		(B2-1 * B9501)-HL?-HL3		255 ⊕	
	365		(B1 * Segaolane)-HL?-HL1		8L SABM 788 ⊕	Long sg hd, VH, Yield
	66		(" ")-??HL/631-1		6L 256 ⊕	
195	67		(B35 * Segaolane)-V19		" 262 ⊕	R, I good 04B/R 275 ⊕
	68	B.V26	(B2-1 * BTx635)		6L 221 ⊕	round (w/tn) No Post
80	69	B.V59	(BTx635 * B803)		03L-B/R 605 ⊕	~~OHPR 575~~ ⊕ (03B/R ...)
45	370	B.804 (R)	(BTx3042 * (BTx625 * B35))		6L 210 ⊕	(See 381)
75	71	B.805 (R)	(" * (" * "))		211 ⊕	(See 382)
not mch 72	72	B.BE7	(B.HF14 * (B1 * B9501))	H Sm Res	234 ⊕	W H. Sm Res
v1/20	73	B.HD37	(BTx630 * B9502)		230 ⊕	R, wy, tn
	74	04L-B/R 766	(B.V78 * B402)-HDDP-BE1		6L 242 ⊕	Post wtn B-Line End
	375	D33-1	(Tx2794 * K22/35)	Purdue/TAM	6L 125 ⊕	YE, A line * Pre not rel by Pur
	376	P 40-1	(" ")	" "	02L 5381 ⊕	" " "
	77	P 46-1	(" ")	" "	02L 5441 ⊕	" " "
91	78	04L-B/R 4849	(B1 * Segaolane)-HD3		06L 257	Tall, Slim hd
	79	CV182 (LEC)	LEC DE/Ldg Br.	B-Line	06L 216 ⊕	Ldg Res
	380		(BTx399 * BTx3048)		" 213	R, Purp, ch
98	81	B804 (W)	(BTx3042 * (BTx625 * B35))		6L 208 ⊕	+ A + Lab AB
68	82	B805 (W)	(" * (" * "))		6L 209 ⊕	
47	83	B806	(BTx623 * (BTx625 * B35))/Sis of (BTx645)		6L 206 ⊕	
	84		(BTx399 * (BTx643 * B35))/LEC/DL0317		6L 214 ⊕	(LDG) 5L 4413
67	385		(BTx631 * (BTx624 * B35))		6L 215 ⊕	w, tn, (LDG) DE
	86	1790L	(SC56 * SC33) Lak		01L 1345 ⊕	Post, Ldg (S+W)
	87		(1790E * BTx398)		02L 5532 ⊕	Post, Ldg (S+W)
	88	SC599-11E	IS17459 der. BC3/Rio Deriv		02L 5512 ⊕	", Ldg, S+W none EHB
	89	P69-2	(Tx430 * K22/35)	Pur/TAMU	01L 1391 ⊕	YE
	390	89CC445	(Tx430 * LASON68)	YE	~~[illegible]~~ 6L 153 ⊕	(See 301) W, tn
	91	SRN39		Striga Res	03L 4045 ⊕	WA Striga Res " "
	92	CS3541	IS3541 Der. c/zz		97L 5784 ⊕	WA " "
	93	Malisor 84-7	IER/ICR Imp Br Line	Mali	02L 5047 ⊕	Head Bug Res " "
	94	Dorado	Improved Cultivar (ICR Orig, selin E.Sal)	El Salvador	99L 1856 ⊕	WA, lrg Seed, Food " "
	395	M90318	ICRISAT Br Line		02L 5527 ⊕	WR + w Th
	96	SC719-11E	IS7013 Der, BC3		96L 3373 ⊕	WR, Spreat "
	97	ICSV 400	ICRISAT Imp. Cult.	Malt Quality	~~00L 2570~~ 01L 3444 ⊕	, Tall
	98	MP531	Mississippi? Devp. Br Line		01L 1334 ⊕	Yield
	99	SC 1030-6	IS11790 BC1		03L 4332 ⊕	HL-Shoumder
	400	IS8525 (D)		Ergot Res.	99L 1522 ⊕	Ergot Res

2009 DTR Rel/Dist Obs (Cont)

		Pedigree			Source				
Xb	401	B 1778			01L 1240 ⊕		D T		
ggT+D ~most	02	03GD6624	(86EON362 * K.Kelo)	Br. line with Fet-For Sudan	05L 4490 ⊕		AT, KR, de	uc Tr, uc, thr	J2 ch
(TBL? 7)	03	03GD6625	(" * ")	↓	4491 ⊕	Tr, D, uc, ss	↓	uc	
	J 04	04LGB-7769(A)	(" ")		4492(A) ⊕	Tr, ch, uc, ss		uc	
	J 405	" (B)	(" ")		4492(B) ⊕	P de		uc	
	I 06	04LGBr 7789(B)	(87EON366 * Ajabsido)		4493(A) ⊕	no uc, ch		no uc	
	J 07	" " (A)	(" * ")		4493(B) ⊕	uc, ch, ss		uc, d	
	J 08	" 7805	(86EO361 * Fet. Gesheish)		4494 ⊕	uc, ch, no uc, T2		no uc	
	D 09	03GD6693	(" ")		4495 ⊕	no uc,		" "	
	D 410	04LGBr 7821	(86EO 374 * Ajabsido)		4496 ⊕	P, ch, no uc		" "	
	D 411	04LGBr 7834(B)	(86EON361 * Fet. Gesheish)	03GD6886 ↓	↓ 4497 ⊕	ch, Tr, no uc	↓	" "	

SC56-6	90IL 2630 ⊕
SC33-6	90IL 2633 ⊕
Town	" 2648 ⊕

From:	Bill Rooney
To:	"Anna J Fox"; "Kathy Ferguson"
Subject:	more transparencies, please
Date:	Monday, November 09, 2009 5:04:00 PM
Attachments:	Lecture 15 - Heterosis and Hybrid Prediction.docx

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Anna and Kathy:

I've got another set of transparencies for you. I'll need them for class tomorrow morning at 9:30 am.

I sure appreciate you.

Regards,
Bill

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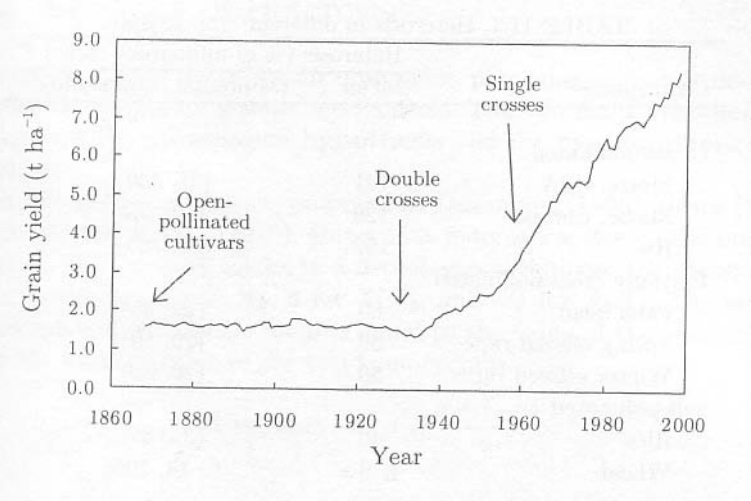
College Station, Texas 77843-2474
979 845 2151

Lecture 15 - Heterosis and Hybrid Vigor (Inbreeding Depression Corollary)

1. Heterosis (hybrid vigor) –
    a. Simple: The superiority of a hybrid over its parents.
    b. Quantitative Genetics: superiority of the hybrid over the mean of the parents (mid-parent heterosis).
    c. Practical Definition: superiority of the hybrid over the best parent (high parent heterosis).
2. Types of Hybrids
    a. Single Cross (modified single cross)
    b. Three way Cross
    c. Double Cross
3. History
    a. Long Known that Inbreeding Depression occurs in some crops
    b. Shull (1908) correctly determined that heterosis was the opposite of inbreeding depression.
        i. Identified that an open pollinated corn population is a mixture of different hybrids
        ii. Selfing in this population leads to inbreeding depression
        iii. Breeders should aim to find and maintain the best hybrid rather than the best pureline
    c. Shull (1909) outlined the procedure to do so (still used today)
        i. Development of inbreds
        ii. Identification of best hybrids from inbreds
    d. Corn provides an excellent example of the development of hybrids
        i. Initial inbreds were very poor, double crosses were required to make enough seed for sale. Problem with double crosses is that they segregate
        ii. As inbreds got better, three way, modified single cross and single cross hybrids were used. The single cross was genetically uniform and captured even more hybrid vigor.
        iii. Heterotic grouping evolved to capture hybrid vigor and reduce testcrossing.



4. Hybrids are superior to cultivars in two ways.

a. Higher productivity through effective capture of hybrid vigor
b. Crop production is more stable with hybrids.

5. Hybrid vigor is exhibited in most crops with heterosis related generally to the degree of self pollination. The more self-pollination, the less the heterosis (although there is some level in most all crops).

Table 3–1. Estimates of midparent heterosis (in percentage of mid-parent performance) for grain yield in different crops.

Crop/mating system	Heterosis			Reference
	Mean	Minimum	Maximum	
		%		
Allogamous				
Maize—U.S.	121	92	240	Dudley et al., 1991
—Europe	129	112	143	Melchinger et al., 1986
Rye	178	86	301	Geiger & Schnell, 1975
	207	117	329	Geiger & Wahle, 1978
Partially allogamous				
Faba bean	45	22	69	Kittlitz, 1986
	74	55	95	Link et al., 1996
Oilseed rape—spring	30	20	50	Grant & Beversdorf, 1985
—winter	50	20	80	Lefort-Buson & Dattee, 1982
Autogamous				
Rice	36	3	106	Saghai Maroof et al., 1997
	55	31	73	Virmani et al., 1982
Wheat	9	−14	106	Martin et al., 1995
Sorghum	24	15		

from Melchinger and Gumber 1998 CSSA Spec Publ. 25 pg 29-44

6. If heterosis is so great, how come all crops are not produced as hybrids? Hybridization requires
    a. Sufficient heterosis
    b. Sufficient and economical seed production
    c. Self pollinated species require a male sterility induction system
        i. Cytoplasmic male sterility
        ii. Gametocides
            1. Temperature
            2. Chemical
    d. Crops that are hybridized
        i. Corn
        ii. Sorghum
        iii. Millet
        iv. Rye
        v. Rice
        vi. Sunflower
        vii. Canola
        viii. Tomato (he)
        ix. Broccoli (he)
7. Until GMO technology, hybrid crops were private sector crops and cultivar crops were public sector. That has changed in the last ten years…..

Genetics of Heterosis:

1. The genetics of heterosis are not well known. Two prominent theories
    a. Dominant Hypothesis
    b. Overdominant Hypothesis
2. Dominance Hypothesis: Davenport (1908), Bruce (1910)
    a. heterosis is the result of dominant effects and it does not involve the presence of overdominant gene action.
    b. AA = a, Aa = d, aa = -a where d=a
    c. Amount of heterosis at a single locus, heterosis is only present when dominance is present:

$$Heterosis = d - \frac{a + (-a)}{2}$$

    d. If taken to the F2 approximately ½ the dominance is lost due to random mating. If random mating continues, then no further loss, but inbreeding will reduce it further. Synthetics utilize the random mating to capture some level of heterosis.
    e. Under dominance, d is by definition not greater than a at any given locus
    f. If more than 1 locus is involved, it is possible to produce a hybrid that outperforms either parental line.

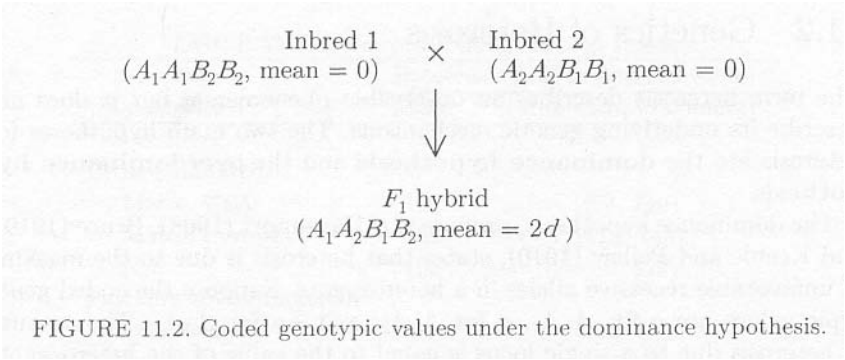


FIGURE 11.2. Coded genotypic values under the dominance hypothesis.

If P1 = 0 (a + (-a) and P2 = 0 (a + (-a) then the F1 = 2d (d+d)

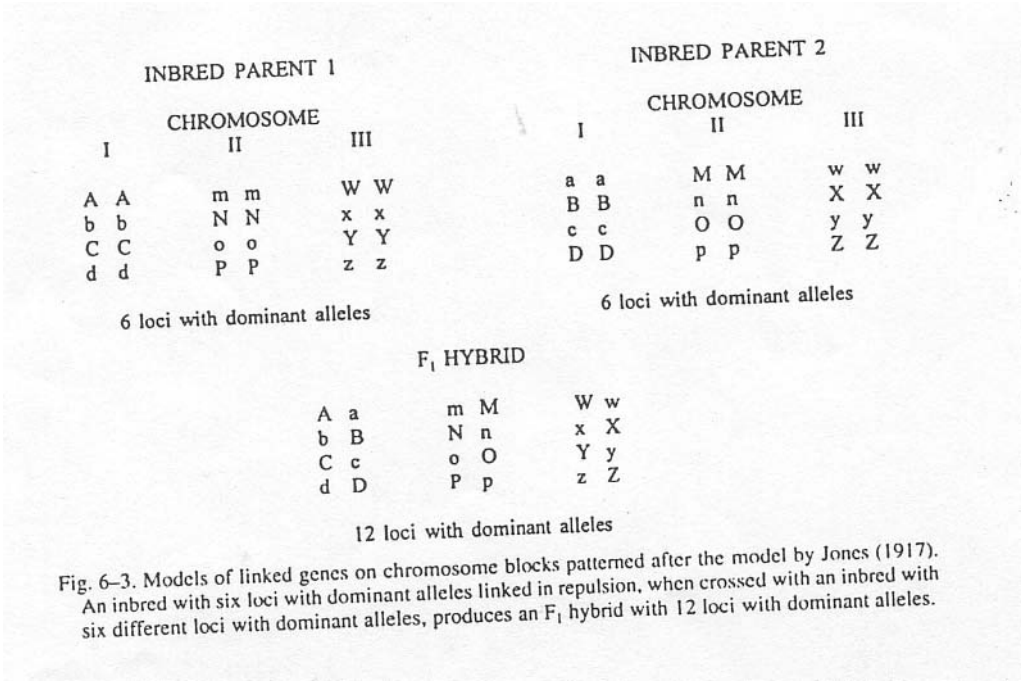


Fig. 6–3. Models of linked genes on chromosome blocks patterned after the model by Jones (1917). An inbred with six loci with dominant alleles linked in repulsion, when crossed with an inbred with six different loci with dominant alleles, produces an F_1 hybrid with 12 loci with dominant alleles.

g. Objections to the Dominance Theory
    i. It should be feasible to produce an inbred that is as good as the hybrid. To date, no corn inbred is as good as any corn hybrid.

    ii. The distribution in the F2 population should be asymmetrical due to the 3:1 segregation at each locus. Most all quantitative traits show a normal distribution. (see Collins, 1921)

3. Overdominance Hypothesis (Shull, 1908; East, 1908; Hull, 1945)
    a. Heterosis is due to the inherent superiority of the heterozygote over either homozygote.
    b. AA = *a*, Aa = *d*, aa = *-a* where *d* > *a*
    c. Unlike dominance, linkage or multiple loci are required for heterosis.
    d. Overdominance implies that hybrids will always outperform inbred lines; it will not be possible for inbred line to equal the performance of hybrids.

Shull (1952) in Heterosis, Iowa State College Ames IA. pg 161.

1. Failure of mass selection and ear-to-row selection beyond the level of the adapted variety.
2. Crossbreeding recombinations of parent lines of elite hybrids yield little more than the original varieties.
3. Hybrids of second-cycle and third-cycle lines yield little more than those of the first cycle.
4. Homozygous maize yields 30% as much as heterozygous maize.
5. No evidence of epistasis in maize yield.
6. Regression analyses of yields of F_1s and inbred parents indicate a zone of nearly level regression near the upper end of the range of present data, where it might be predicted with the kind of artificial selection which has been practiced, and in the event of overdominance.
7. There is some evidence that selection for general combining ability alone with respect to yield is effective and this too is consistent with the expectation of overdominance theory.
8. The fact of hybrid maize is hardly to be explained as other than a result of selection for specific combinability, which in turn is manifestly dependent on heterozygosity of maize yield genes.

4. Psuedo-overdominance – the appearance of an overdominant gene action that is the result of two QTL in <u>repulsion</u> phase linkage. Gives the appearance of overdominant gene action when it is simply dominant gene action at both loci.

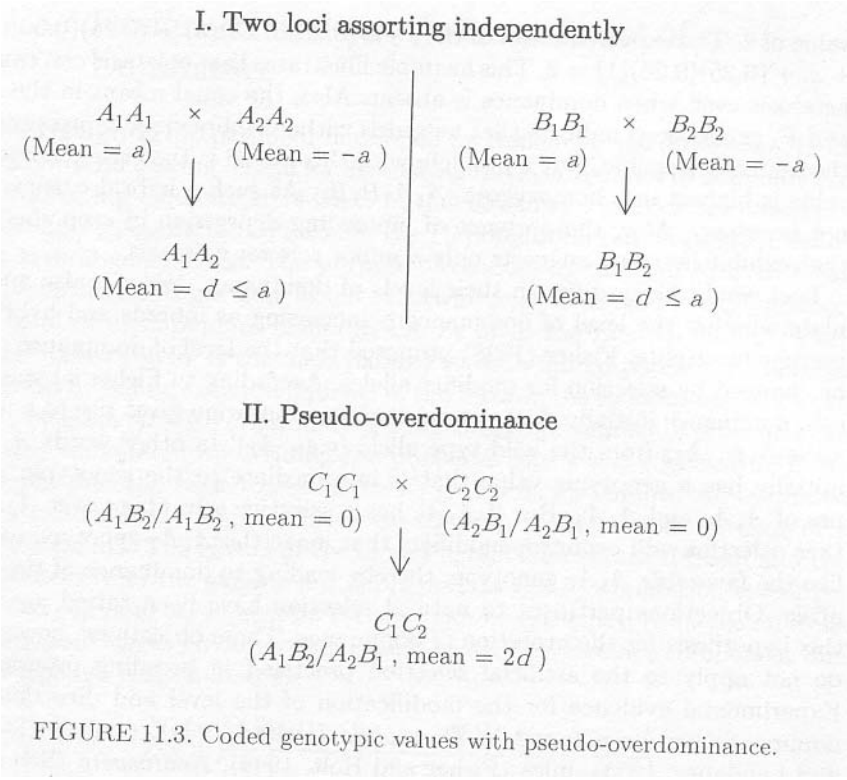


FIGURE 11.3. Coded genotypic values with pseudo-overdominance.

5. Epistasis and Heterosis – epistasis should play a role in heterosis, but defining that role is difficult using traditional approaches to estimate epistatic interactions and importance.

TABLE 11.2. Genotypic values with epistasis in an F_2 population.

	B_1B_1	B_1B_2	B_2B_2	Mean at locus A
A_1A_1	5	3	1	3
A_1A_2	3	2	1	2
A_2A_2	1	1	1	1
Mean at locus B	3	2	1	

6. Loci differ in magnitude of effect; they likely differ in level of dominance; hence a one or another scenario is probably not appropriate.
    a. Most data support the concept of heterosis due to partial or complete dominance. While this does not preclude overdominance at any particular loci, the preponderance of detailed study reveals dominance is the main factor.
    b. The role of epistasis is still not well documented although more recent studies are now showing a greater role for the concept.
    c. While we don't know (and may never know) the exact basis, it does not preclude the use of heterosis and capturing its value.

7. Empirical Evidence of the Basis of Heterosis
    a. In most studies that report overdominant gene action, multiple generations of random mating reduce the d/a ratio from >1 to between 0 and 1. This implies significant amounts of repulsion linkage and pseudo overdominance. (Gardner, 1963; Graham et al., 1997 Crop Sci 37:1603)

TABLE 11.4. Average level of dominance for maize grain yield.

Generation	Population	
	CI21 × NC7	M14 × 187-2
F_2	1.68[a]	1.98
F_2 random mated 2 times		1.04
F_2 random mated 6 times	1.24	0.72
F_2 random mated 11 times	1.09	
F_2 random mated 14 times		0.62

[a] Data from Gardner (1963)

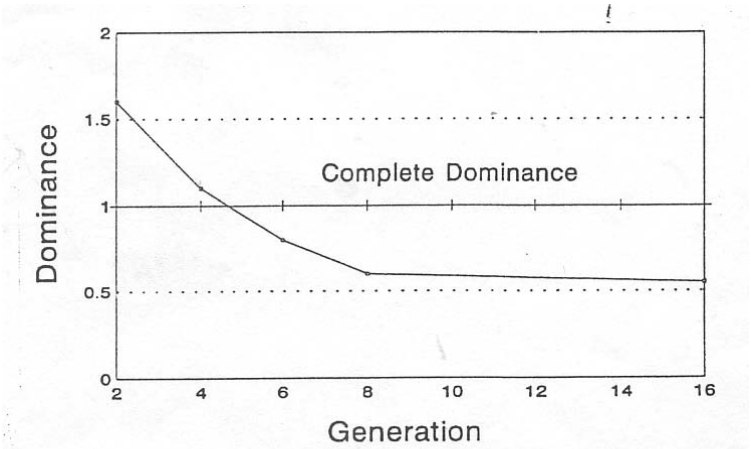


Fig. 6–4. Summary of results showing a decrease in estimates of dominance in maize with the approach to linkage equilibrium (Gardner & Lonnquist, 1959; Lonnquist, 1980; Gardner, 1992, personal communication).

b. Inbred line performance has actually improved at a faster rate than hybrid performance (% heterosis has dropped). If overdominance were the main mode, then improvement of an inbred line should be very limited. (Troyer and Wellin, 2009, Crop Science 49:1969)

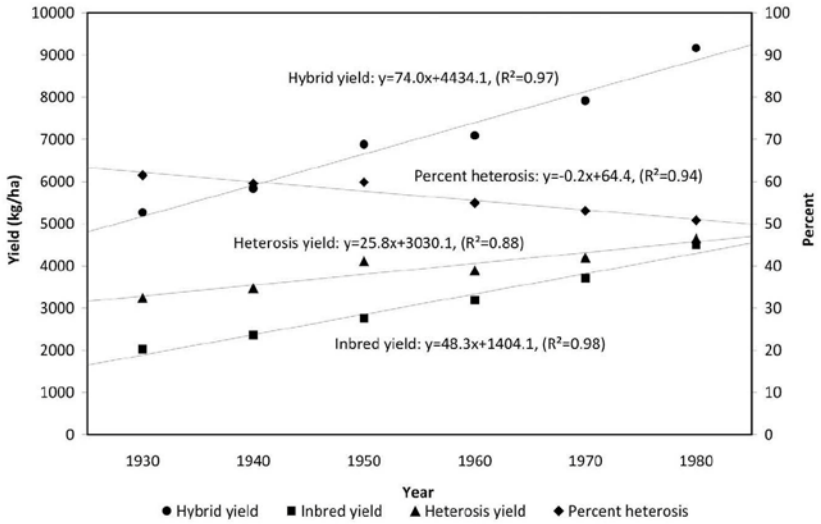


Figure 2. Percentage heterosis, heterosis yield, commercial hybrids yield, and inbreds yield of corn regressed on decade of hybrid popularity (Duvick, 1999; Troyer, 2006).

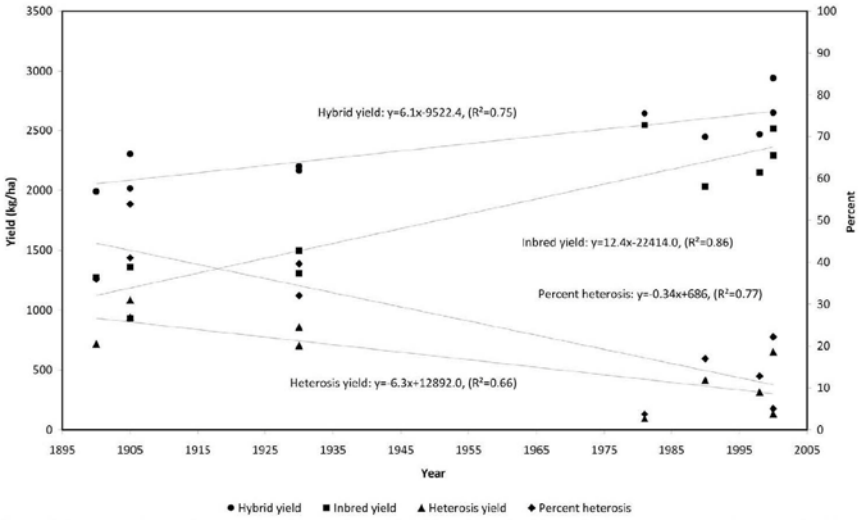
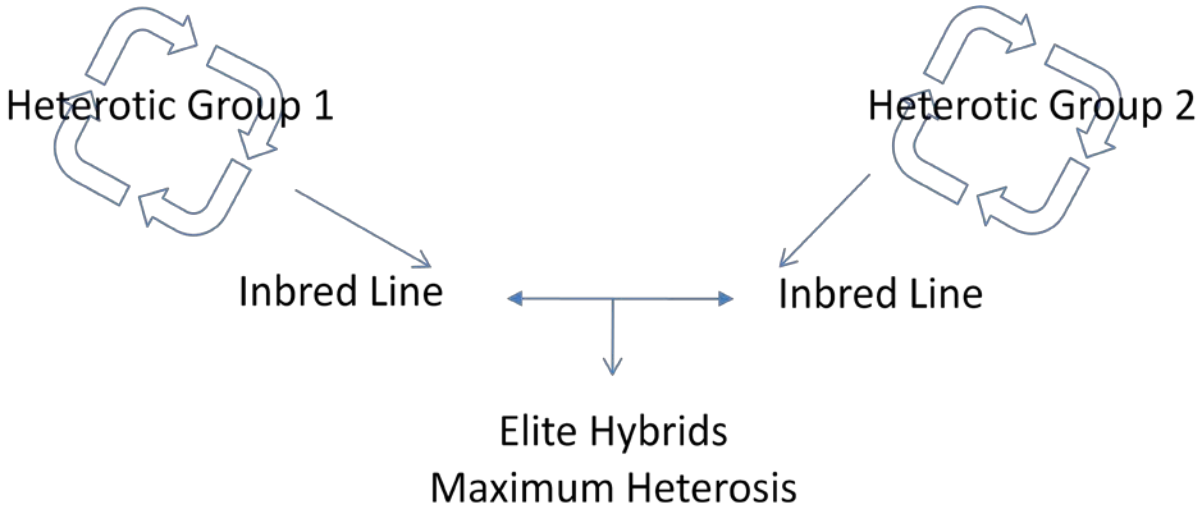


Figure 3. Percentage heterosis, heterosis yield, experimental hybrids yield, and cultivars yield in cotton regressed on year of cultivar introduction (Campbell et al., 2008).

c. The role of epistasis remains somewhat nebulous and difficult to quantify (Yu et al., PNAS 94:9226; Melchinger et al., 2007, Genetics 177:1827.
    i. Often confounded with overdominant estimates.

Heterotic Groups and Patterns

1. Definition: A heterotic group is a set of germplasm that has a predictable and complementary performance when hybridized with another group or groups.
2. Identification of HG greatly simplifies the breeding process because it establishes the the appropriate sets of material for hybrid combination and it establishes breeding populations for line per se improvement.



3. Identification/Development of Heterotic Groupings. Effective heterotic groups are defined by the following factors (in order of descending importance) (Melchinger and Gumber, 1988)
    a. High Mean Performance and Large Genetic Variance between heterotic groups.
    b. Suitable performance and adaptation of the inbreds/populations of heterotic groups.
        i. Females have acceptable/good seed yields
        ii. Males have good pollen shed
    c. Minimized Inbreeding Depression (applicable in crops that express appreciable levels of inbreeding depression). Some crops affected more than others
    d. Cytoplasmic Male Sterility System (as applicable)
4. Examples of Established Heterotic Groups
    a. Defined by established, historical patterns
        i. Corn
            1. U.S. – Iowa Stiff Stalk (BSSS) and nonBSSS
            2. Tropical – Tuxpeno and non-Tuxpeno
            3. Europe – Flint and Dent
        ii. Rye – Petkus x Carsten
    b. Defined by subspeciation
        i. Rice - *O. indica* and *O. japonica*
    c. Defined by Cytoplasmic Male Sterility
        i. Sorghum – milo (restorers) and kafir (maintainers)
        ii. Sunflower – restorers and maintainers

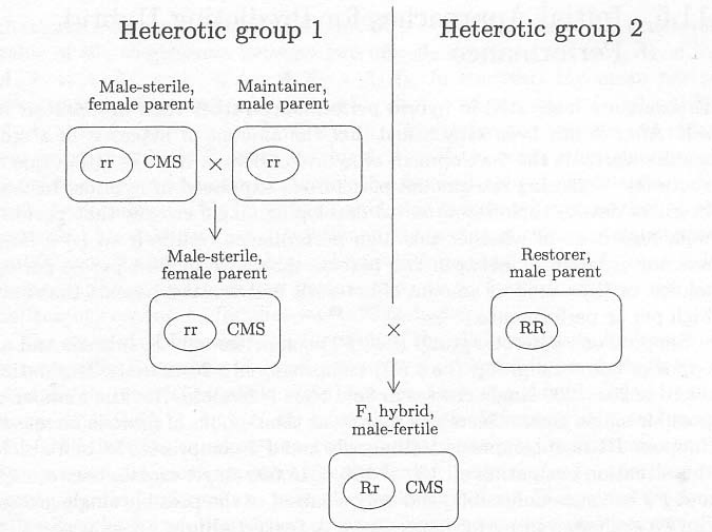
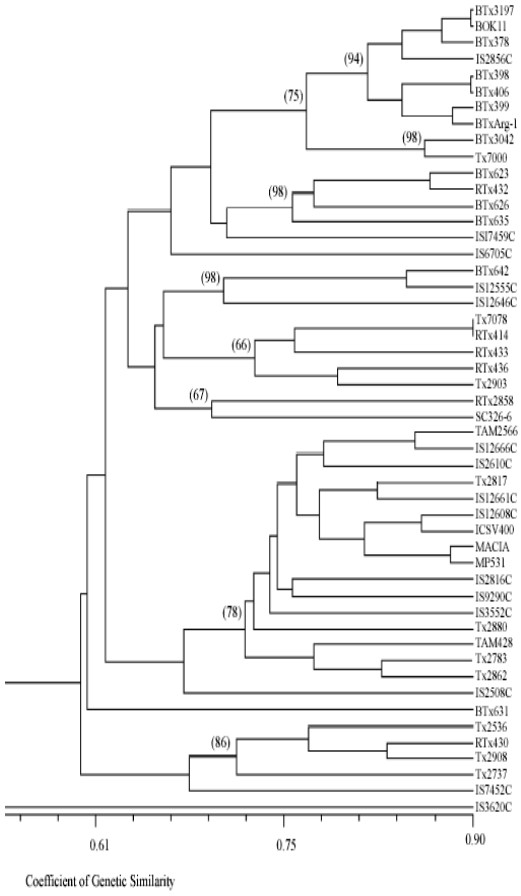


FIGURE 11.4. Hybrid seed production with cytoplasmic male sterility.

5. Developing or Assigning Germplasm to a Heterotic Group
    a. Systematic testcross evaluation with existing HG
    b. Molecular diversity analysis is useful in establishing testable patterns



From: Bill Rooney
To: "Sonnie Feagley"
Subject: ProCard receipt
Date: Sunday, November 01, 2009 11:26:00 AM
Attachments: COLOUR approval form 09-105.pdf

Sonnie:

Please find attached a future charge on my procard.

There are three color figures so as I calculate the charges, it will be $1450.

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

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Authorization of Payment for Colour Illustrations

Manuscript No.: 09-105

Title: Early-generation Germplasm Introgression from Sorghum macrospermum into Sorghum (S. bicolor)

Author(s): Les C Kuhlman, Byron L Burson, David Stelly, Patricia Klein, Robert R Klein, Harold J Price, and William L Rooney

Journal: Genome

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Canada

(12/2006)

From: Bill Rooney
To: "Editorial Office"
Subject: RE: 09-105
Date: Sunday, November 01, 2009 11:24:00 AM
Attachments: COLOUR approval form 09-105.pdf

Please find attached the signed colour approval form.

If you need anything else, 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: Editorial Office [mailto:genome@yorku.ca]
Sent: Monday, October 26, 2009 12:46 PM
To: wlr@tamu.edu
Subject: 09-105

Dear William Rooney :

Re: 09-105
Early-generation Germplasm Introgression from Sorghum macrospermum into Sorghum (S. bicolor) Les LCK Kuhlman, Byron BLB Burson, David Stelly, Patricia Klein, Robert R Klein, Harold James H.J. Price, and William WLR Rooney

We are short on manuscripts for our January issue and we should be able to get you in that issue if you can upload your files and return the attacfhed form within the next couple of days.

Sincerely,
Alistair Coulthard
Assistant to the Editor
GENOME

National Research Council Canada | Conseil national de recherche Canada

Authorization of Payment for Colour Illustrations

Manuscript No.: 09-105

Title: Early-generation Germplasm Introgression from Sorghum macrospermum into Sorghum (S. bicolor)

Author(s): Les C Kuhlman, Byron L Burson, David Stelly, Patricia Klein, Robert R Klein, Harold J Price, and William L Rooney

Journal: Genome

The cost of publishing your colour figures is $950 for the first page and $250 for every subsequent page plus applicable taxes. Prices outside Canada are in US dollars. This price includes the cost of printing sufficient pages in colour to cover the press run of the journal and reprints.

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Name & Title: William L. Rooney, Professor Per: *(Signature)*

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Canada

(12/2006)

From:	Bill Rooney
To:	"Anna J Fox"
Cc:	"Glenda Kurten"; "jm-chandler@tamu.edu"
Subject:	RE: Call for Nominations - 2009 Vice Chancellor"s Awards in Excellence
Date:	Monday, November 02, 2009 2:45:00 PM
Attachments:	PUBLICATION FORM FOR INDIVIDUAL NOMINATION - WLR.doc VITA FORM FOR INDIVIDUAL NOMINATION - WLR.doc

---

Anna:

Dr. Chandler asked me to send these documents to you for a VC award nomination packet. I trust you know what to do with them.

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: Glenda Kurten [mailto:g-kurten@tamu.edu]
Sent: Monday, November 02, 2009 9:14 AM
To: Bill L Rooney
Cc: Mike Chandler
Subject: Fwd: Call for Nominations - 2009 Vice Chancellor's Awards in Excellence

Here is the Vice Chancellor's info that Dr. Chandler is talking about.

You will have to pick through the correct forms.

Thanks,
Glenda

SELECTED PUBLICATIONS FOR WILLIAM L. ROONEY

Dykes L, LM Seitz, **WL Rooney** and LW Rooney. 2009. Flavonoid Composition of Red Sorghum Genotypes. Food Chemistry 116:313-317.

Murray SC, **WL Rooney**, MH Hamblin, SE Mitchell, and S Kresovich. 2009. Sweet sorghum genetic diversity and association mapping for brix and height. The Plant Genome. 2:48-62.

Perumal, R, MA Menz, PJ Mehta, S Katile, LA Gutierrez Rojas, RR Klein, PE Klein, LK Prom, JA Schlueter, **WL Rooney**, CW Magill 2009. Molecular mapping of Cg1, a gene for resistance to Anthracnose (*Colletotrichum sublineolum*) in sorghum. Euphytica 165:597-606.

Balota M, WA Payne, D Rosenow, and **WL Rooney**. 2008. Gas exchange and Transpiration Ratio in Sorghum. Crop Sci 48:2361-2371.

Murray SC, **WL Rooney**, SE Mitchell, PE Klein, A Sharma, JE Mullet, and S Kresovich. 2008. Sorghum as a Biofuel Feedstock: II. QTL for Leaf and Stem Structural Carbohydrates. Crop Sci 48:2180-2193.

Murray SC, A Sharma, **WL Rooney**, PE Klein, JE Mullet, SE Mitchell, and S Kresovich. 2008. Genetic improvement of sorghum as a biofuel feedstock: I. QTL for stem and grain nonstructural carbohydrates. Crop Sci 48:2165-2179.

Kuhlman, LC, BL Burson, PE Klein, RR Klein, DM Stelly, HJ Price, and **WL Rooney**. 2008. Genetic Recombination in *S. bicolor* x *S. macrospermum* Interspecific Hybrids. Genome 51:749-756.

Fernandez, MG, M Hamblin, L Li, **WL Rooney**, MR Tuinstra, and S Kresovich. 2008. QTL analysis of endosperm color and carotenoid content in sorghum grain. Crop Sci 48:1732-1743.

Klein RR, JE Mullet, DR Jordan, FR Miller, **WL Rooney**, MA Menz, CD Franks, and PE Klein. 2008. The Effect of Tropical Sorghum Conversion and Inbred Development on Genome Diversity as Revealed by High-Resolution Genotyping. Crop Sci. 48(S1) S12-S26.

Rooney, WL, J Blumenthal, B Bean, and JE Mullet. 2007. Designing sorghum as a dedicated bioenergy feedstock. Biofuels, Bioprod. Bioref. 1:147-157.

Price, HJ, GL Hodnett, BL Burson, SL Dillon, DM Stelly, and **WL Rooney**. 2006. Genotype Dependent Interspecific Hybridization of Sorghum bicolor. Crop Sci. 46:2617-2622

Brown, PJ, PE Klein E. Bortiri, C. Acharya, **WL Rooney** and SK Kresovich. 2006. Inheritance of Inflorescence Architecture in Sorghum. Theor. Apppl. Genetics 113: 931-942.

VITA FORM – William L. Rooney

NOMINEE: Dr. William L. Rooney

Current title/position: Professor, Sorghum Breeding and Genetics

Department/administrative unit: Soil and Crop Science **District #** n/a

Mailing Address (department/center): 2474 TAMU

Years within Texas A&M AgriLife 14 **E-Mail Address:** wlr@tamu.edu

Current position	% appointment – teaching	45
	% appointment – research	55

Personal Information:

Education

1992	Ph.D.	Plant Breeding and Genetics	University of Minnesota
1989	M.S.	Plant Breeding	Texas A&M University
1987	B.S.	Agronomy	Texas A&M University

Experience

2005-present Professor, Dep. of Soil & Crop Sciences, Texas A&M University
Sorghum Breeding and Genetics including germplasm development, breeding methodology studies, genetic inheritance of agronomically important traits in sorghum (grain, forage and bioenergy), teaching graduate plant breeding courses and advising graduate research in plant breeding.

2000-2005 Associate Professor, Department of Soil & Crop Sciences, Texas A&M University

1995-2000 Assistant Professor, Department of Soil & Crop Sciences, Texas A&M University

1993-1995 Assistant Professor, Department of Agronomy, Kansas State University, Manhattan, KS
Alfalfa Breeding and Genetics including cultivar development, breeding methodology studies, genetic inheritance of specialty-traits in alfalfa, teaching graduate plant breeding courses

Course Instruction: Agro 642 Plant Breeding II (annually since 1995)
Graduate Advising: Cumulative since 1995

Degree	Committee Chair	Committee Member	Current	Total
M.S.	12	10	3	25
Ph.D.	12	18	7	37

Agrilife Committee:

2001-present: Chair, Plant Release Committee. This Agrilife committee provides merit based review of proposed plant releases by Agrilife plant breeders/scientists.

External Research Funding/Grant Activity (since 2006):

Topic	PIs, Institution	Funding Source	Amount WLR
Genetic Dissection of bioenergy traits in sorghum	Vermerris et al, U Fla, UNL, Agrilife	DOE/USDA Feedstock Genomics Program	$134,000
Assessment of Sorghum as a Bioenergy Crop	Rooney and Heilman, Agrilife	Regional Feedstock Partnership – DOE and NC SunGrant	$150,000
Genetic Analysis of Sorghum Drought Tolerance Traits	Mullet and Rooney, Agrilife	DuPont/Pioneer	$250,000
Lignocellulosic Feedstock Development for Gen II Biofuels	Gould and Mullet, Agrilife	Chevron Sponsored Research	$765,000
Development of Bioenergy Sorghum and Enhancement of Sweet Sorghum Breeding	Rooney et al., Agrilife	Ceres, Inc.	$2,000,000
Advancing Texas Biofuel Production	Rooney and Chambliss, Agrilife and Baylor	US Congress Special Appropriations	$50,000
Breeding Sorghum for Improved Grain and Forage Quality and Yield for Central America	Rooney, Agrilife	US AID INTSORMIL CRSP	$335,732
Sorghum Feedstock Genomics	Rooney, Mullet and Kresovich, TAMU and Cornell	DOE/USDA Feedstock Genomics Program	$250,000
Evaluation of Sweet Sorghum Hybrids as a Bioenergy Feedstock for the South Central U.S.	Rooney et al., Agrilife, OSU, NMSU, KSU	South Central SunGrant Program	$327,125
Total (External)			$4,261,857

Publications

- 69 Journal Articles (see selected publications)
- 6 Book Chapters
- 34 Invited Presentations

Technology Transfer

- 8 Public Sorghum Plant Releases consisting of 85 different sorghum parental lines and/or germplasms
- 2 Provisional Patents
- Numerous (>30) material transfer agreements and/or licensing agreements on sorghum germplasm

Awards, Honors, Professional Memberships

- Department Faculty Research Award, 2009
- American Society of America, member
- Crop Science Society of America, member
- U Minnesota Hamm Graduate Fellowship, 1989
- Texas A&M Distinguished Graduate Student – Research, 1989

From: Bill Rooney
To: "mohan gowda"
Subject: RE: exam
Date: Monday, November 09, 2009 8:39:00 AM
Attachments: Gowda Preliminary Exam WLR.doc

Good luck – questions, please call me.
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: mohan gowda [redacted]
Sent: Monday, November 09, 2009 8:28 AM
To: Dr.Bill Rooney
Subject: exam

Dr.Rooney,
I am waiting for your exam. Would you please send me the question paper.

Thanks
Mohan

Written Preliminary Exam
for Kerry Mayfield

Monday, November 09, 2009

Closed Book
E-mail to me by 8:00 pm

Please respond to each question using well written sentences and/or paragraphs that indicate you can write the English language effectively. As diagrams are needed, please include them as well. You have all day, so I expect legible and clear answers.

1. In your sorghum breeding program, anthracnose resistance is an absolutely critical trait and you have identified two sources of absolute resistance (both are resistant to all pathotypes in your possession). You need to know whether these sources have the same or different resistance genes. Describe the experiment and expected results dependent on whether the resistance is the same gene or different genes.

2. Write a succinct (1 page max) but descriptive case to justify funding for interspecific/ intergeneric hybridization for crop improvement. This is not crop dependent and must describe why this work is important.

3. Due to political mandates that dictate we will not use "food" crops for biofuel, the fledgling biofuel industry is grasping for alternative plant species as sources of biomass for biofuel conversion. Worldwide five prominently mentioned species are tropical sugarbeets, switchgrass, camelina, miscanthus and algae. None of these crops have much commercial production but all have been widely publicized as the answer to our biomass production problems.
    a. What is your opinion of the political mandate that NOT use food crops as fuel sources?
    b. For the five species listed, how will it be used for biofuel production (ie, oil, lignocelluosic, starch, etc.).
    c. Of the five, which would you recommend for investment and development to someone interested in commercial sales of a crop. Explain why.

4. How do commercial companies integrate the transgenic and traditional breeding approaches?

5. ALS and ACCase herbicide tolerance is being promoted for the sorghum industry.
    a. How was ALS herbicide resistance transferred to grain sorghum?
    b. Should agriculturists/agronomists have any concerns regarding ALS herbicide resistance in sorghum?
    c. What should be the concern of the sorghum industry pertaining to the transfer of this trait to sorghum?

6. Tell me about heritability. Include in the discussion the types, how they are measured (with examples) and how they are used. In the discussion, please explain how heritability estimate can be highly variable.

7. On which continent were MOST of our major crops (and animals) domesticated? Can you provide me with a logical reason as to why most of our domesticated plants (and for that matter, animals) came from this single continent?

8. Describe the drought tolerance mechanisms in sorghum that make the crop more drought tolerant than most all other cereal crops. Explain how the measurements that you are making relate to these traits.

From: Bill Rooney
To: [redacted]
Subject: RE: 09-105
Date: Wednesday, November 04, 2009 10:21:00 AM
Attachments: fig 2.DOC
Genome 09-105 Revision.doc
IntroMS Fig 1.psd
IntroMS Fig 3.psd

Alistair:

I have attached the manuscript (revised, and the three figures). If you need anything else, 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: [redacted]
Sent: Wednesday, November 04, 2009 9:55 AM
To: Bill Rooney
Subject: RE: 09-105

Dear Dr. Rooney,

The files for your manuscript do not appear to be there. We had some difficulties with uploaded files and it may have affected your manuscript. If you can e-mail me the final files for your manuscript I can send them to the publisher and uploaded them to the system when it's working properly.

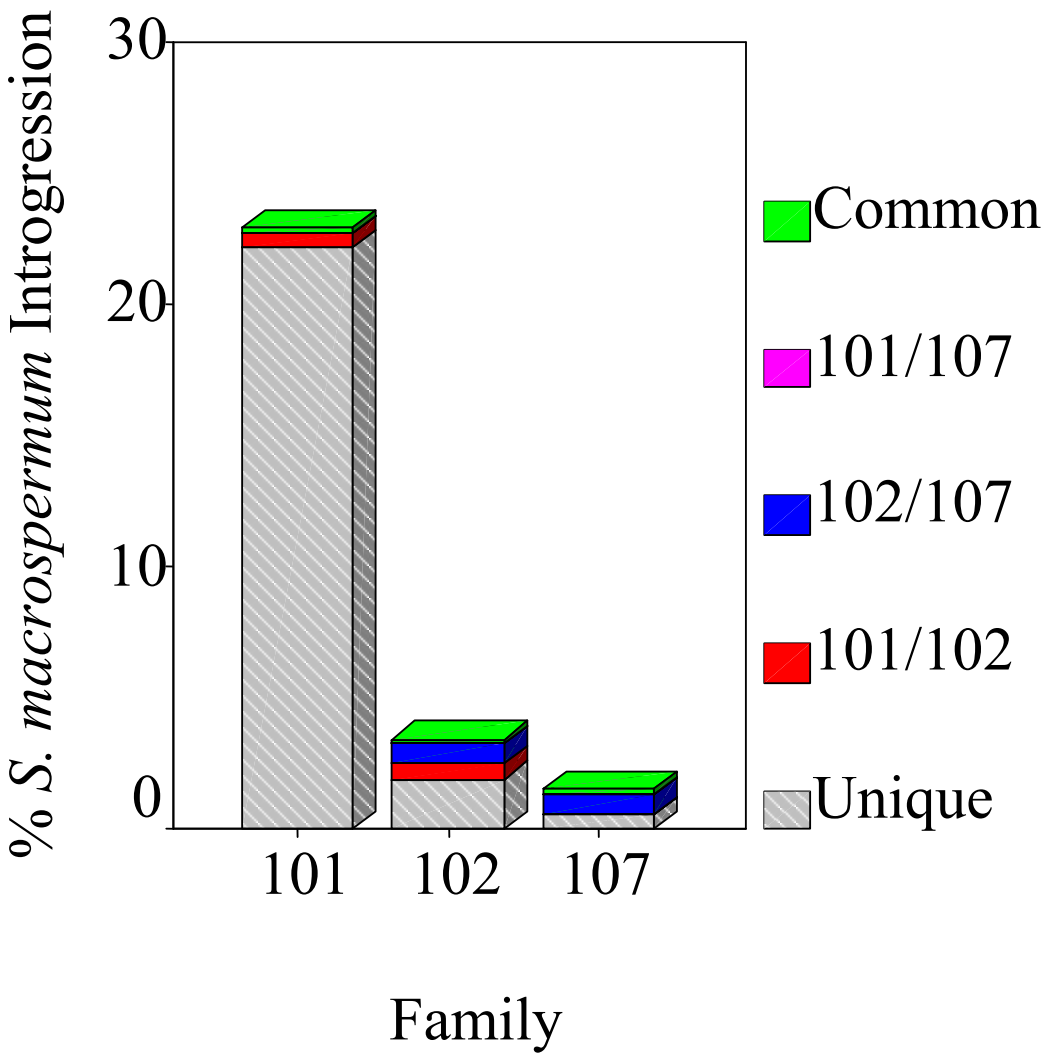
I have everything else. Sorry for this inconvenience.

Sincerely,
Alistair Coulthard
Assistant to the Editor
GENOME
e-mail [redacted]
phone and fax: 905-237-3645
OSPRey link:
https://osprey.pubs.nrc-cnrc.gc.ca/publisher/access.view?journalCode=GENOME

Quoting Bill Rooney <wlr@tamu.edu>:

> Please find attached the signed colour approval form.
>
> If you need anything else, 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: Editorial Office [redacted]
> Sent: Monday, October 26, 2009 12:46 PM
> To: wlr@tamu.edu
> Subject: 09-105
>
> Dear William Rooney :
>
> Re: 09-105
> Early-generation Germplasm Introgression from Sorghum macrospermum into
> Sorghum (S. bicolor) Les LCK Kuhlman, Byron BLB Burson, David Stelly,
> Patricia Klein, Robert R Klein, Harold James H.J. Price, and William WLR
> Rooney
>
> We are short on manuscripts for our January issue and we should be able to
> get you in that issue if you can upload your files and return the attacfhed
> form within the next couple of days.
>
> Sincerely,
> Alistair Coulthard
> Assistant to the Editor
> GENOME
>


% S. macrospermum Introgression
30
20
10
0
101
102
107
Family
Common
101/107
102/107
101/102
Unique

Early-generation Germplasm Introgression from *Sorghum macrospermum* into Sorghum (*S. bicolor*)

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ABSTRACT

Sorghum has been improved by public and private breeding programs utilizing germplasm mostly from within the species *Sorghum bicolor*. Recently, hybridization with an Australian species, *S. macrospermum* (AAB_1B_1YYZZ), has been demonstrated and the genomic relationship to *S. bicolor* (AAB_1B_1) shown to be partially compatible. For this species to be potentially useful to sorghum improvement programs, there must be documented introgression into an *S. bicolor* background. Fifteen BC_1F_1 progeny were recovered using the interspecific hybrid as a female and embryo rescue. In these progeny, chromosome numbers ranged from 35 – 70 and all were essentially male sterile. Repeated backcrossing with *S. bicolor* pollen, produced BC_2F_1 seed on 3 of the 15 BC_1F_1 plants. BC_2F_1 progeny had varying levels of male fertility; selfed seed set ranged from 0 – 95% with only 2 being completely male sterile. Using AFLP and SSR markers, genomic introgression of *S. macrospermum* ranged from 0 – 18.6%. Cytogenetic analysis of 19 individuals revealed chromosome numbers were 20, except for a single backcross which had 21 chromosomes. Molecular cytogenetic analysis confirmed the presence of recombinant introgression chromosomes as well as alien addition and alien substitution chromosomes within the BC_2F_1s.

INTRODUCTION

Sorghum (*S. bicolor* [L.] Moench) is an important food and feed crop around the world. The 2006 U.S. grain sorghum crop was valued at approximately $715 million (USDA, 2006) and worldwide is the 5th most grown cereal grain. Plant breeders continuously improve the crop for yield potential, drought tolerance, disease and insect resistance, and other biotic and abiotic stresses. Genetic variation is the lifeblood of plant breeding so identification of useful new sources is a worthwhile endeavor.

Taxonomically, the genus *Sorghum* is separated in to 5 sections: *Eusorghum*, *Chaetosorghum*, *Heterosorghum*, *Parasorghum*, and *Stiposorghum* (Garber, 1950; de Wet, 1978). The cultivated species is grouped within section *Eusorghum* along with *S. propinquum* and the noxious weed *S. halepense*. Genetic improvements in sorghum have been made by utilizing genetic variation from within the primary gene pool, which contains all of the germplasm in the three subspecies of *S. bicolor*: ssp. *arundicum*, *bicolor*, and *drumondii* (de Wet, 1978; Cox et al., 1984; Duncan et al., 1991). The secondary gene pool is composed of the remaining two species in *Eusorghum*. Crosses between sorghum and *S. propinquum* are easily made, meiosis is normal in the interspecific hybrids, and progeny are fertile, but there has been little to no use of this germplasm in applied sorghum improvement (Wooten, 2001). Hybrids between sorghum and *S. halepense* are more difficult to produce but still possible. Most efforts in utilizing *S. halepense* as a genetic resource have been devoted to developing perennial grain crops (Piper and Kulakow, 1994; Cox et al., 2002; Dweikat, 2005). The tertiary gene pool contains the 17 remaining species within the four other sections. Until

recently, this gene pool was completely inaccessible as no hybrids had ever been recovered despite numerous efforts (Karper and Chisholm, 1936; Ayyanger and Ponnaiya, 1941; Garber, 1950; Endrizzi, 1957; Tang and Liang, 1988; Wu, 1990; Sun et al., 1991; Huelgas et al., 1996).

The cause of reproductive isolation between sorghum and the tertiary gene pool was unknown until Hodnett et al., (2005) determined that it was due to pollen-pistil incompatibilities. Pollen tube growth of wild species was inhibited in the stigma and style which prevented successful fertilization. The reproductive barriers proved to be strong but not complete as Price et al., (2005) finally recovered one interspecific hybrid between cytoplasmic male-sterile (CMS) sorghum and *S. macrospermum*. The efficiency of producing this hybrid improved dramatically by using a *S. bicolor* genotype homozygous for the *iap* allele. The *Iap* locus (*I*nhibition of *A*lien *P*ollen) controls a pistil barrier that prevents foreign species pollen tube growth; whereas, the recessive genotype (*iap iap*) allows pollen tube growth of maize as well as wild sorghum species (Laurie and Bennett, 1989; Price et al., 2006). Price et al., (2006) recovered hybrids between sorghum and *S. macrospermum*, *S. nitidum*, and *S. angustum* but only hybrids with *S. macrospermum* survived to maturity.

S. macrospermum ($2n = 40$) is the only member of the *Chaetosorghum* section and it is native to the Katherine area in the Northern Territory of Australia (Lazarides et al., 1991). While this species does not possess any obvious agronomically desirable traits, it does have significant pest resistance. It is either a non-host or has ovipositional non-preference to sorghum midge (*Stenodiplosis sorghicola* Coquillett) (Franzmann and

83 Hardy, 1996; Sharma and Franzmann, 2001). It is not susceptible to sorghum downy
84 mildew (*Peronosclerospora sorghi* Weston and Uppal (Shaw)) (Kamala et al., 2002) and
85 has high tolerance to shoot fly (*Atherigona soccata* Rond.) (Sharma et al., 2005). These
86 beneficial traits, as well as the possibility that it holds other valuable unique genetic
87 variation, make it attractive to use in an introgression breeding program.
88 Until recently, the genomic relationship between *S. macrospermum* and *S.*
89 *bicolor* was not known. Several authors have described *S. bicolor* ($2n = 4x = 20$;
90 AAB_1B_1) has an ancient tetraploid; its genomic formula was derived by analyzing
91 meiosis in hybrids with *S. halepense* ($2n = 8x = 40$; $AAAAB_1B_1B_2B_2$) (Hadley, 1953;
92 Celerier, 1958; Tang and Liang, 1988). Meiotic chromosome pairing behavior in
93 interspecific hybrids between *S. bicolor* and *S. macrospermum* revealed that moderate
94 levels of allosyndetic recombination occurred and the genomic formula AAB_1B_1YYZZ
95 was proposed for *S. macrospermum* ($2n = 8x = 40$) (Kuhlman et al., 2008). Allosyndetic
96 recombination was observed in subgenomes A and B_1, but the frequency was 2.5 times
97 higher in subgenome A. The authors attempted to produce backcrosses using the
98 interspecific hybrid as a male, but were not successful.
99 The tertiary gene pool species *S. macrospermum* is now available to plant
100 breeders because hybrids can now be recovered by using specific *S. bicolor* germplasm
101 (*iap iap*). The sorghum and wild species genomes undergo moderate levels of
102 allosyndetic recombination; therefore, recovering introgression in backcross progeny is
103 likely (Kuhlman et al. 2008). The remaining obstacle to using this species in an
104 introgression program is determining how to recover backcrosses. The objectives of this

105 research were to produce $2n = 20$ introgression germplasm through backcrossing and to
106 analyze introgression content in backcross progeny molecularly and cytologically.
107
108 MATERIALS AND METHODS
109 Plant Material
110 Interspecific hybrids were produced by hand emasculating 'NR481', the *S.*
111 *bicolor* parent, and pollinating it with the wild species *S. macrospermum* (AusTRC
112 Accession no. 302367). Female plants set approximately 25% hybrid seed, which had
113 shrunken endosperm. Approximately 60% of hybrid seeds germinated on agar
114 germination media and were transplanted into soil in small pots in a greenhouse during
115 April, 2005 in College Station, TX. They were transplanted as growth demanded up to a
116 final pot size of 15 gallons. Interspecific hybrids were tall (> 4.5m) and photoperiod
117 sensitive (initiating anthesis in September). Backcrosses were made using pollen from
118 both the recurrent parent NR481 and BTx623.
119 Embryo rescue was necessary to recover backcrosses and was performed 15 to
120 20 days after pollination. Enlarged ovaries were removed from the florets and surface
121 sterilized in 30% bleach for 20 minutes. The soft pericarp tissue was removed and the
122 immature embryos were placed in sealed Petri dishes on culture medium containing
123 Murashige-Skoog basal salts and vitamins (Murashige and Skoog, 1962) supplemented
124 with 10mg L^{-1} glycine, 10mg L^{-1} L-arginine, 10mg L^{-1} L-tyrosine, 100mg L^{-1} inositol,
125 and 50 g L^{-1} sugrose, solidified with 0.7% plant tissue culture grade agar (Sharma,
126 1999). Dishes were placed in a growth chamber with 16 h light/8 h dark at 24ºC.

Germinated embryos with good root growth and 2-3 leaves were removed from the media and transplanted into a fine texture soil mixture in pots. These were placed in a plastic tray with a clear dome lid inside the growth chamber with wet paper towels to ensure high humidity. As plants grew they were hardened off and transferred to the greenhouse.

Germplasm Evaluation

Male gamete viability was estimated by collecting anthers from flowering plants and macerating them in a drop of 1% I_2-KI stain on a glass slide. Slides were analyzed under a microscope, pollen grains were counted and classified as fully stained, greater than 50% stained, less than 50% stained, and unstained. Plant height was measured in inches from the soil surface to the tip of the mature panicle. Some plants were also characterized for plant color, seed color, presence of awns, mid-rib type, days to 50% anthesis, and seed set. Field evaluation of selected BC_2F_1 progeny from family 101 was carried out in Weslaco, TX in fall, 2006. Plants were self pollinated and at harvest evaluated for plant height and seed color. Specific measure of seed set was not taken although no plants were identified as sterile. Evaluation of BC_2F_1 progeny from all three families was carried out in a greenhouse in winter 2006 in College Station, TX.

Molecular Marker Evaluation

DNA was extracted from backcross progeny and their parents using the FastDNA Spin Kits (MP Biomedicals, Solon, OH). AFLP templates, using both *EcoRI*/*MseI* and

149 *PstI*/*MseI* restriction enzyme combinations, were created using a modified procedure
150 from Vos et al., (1995). The AFLP template, preamplification, and selective
151 amplification reactions of the *EcoRI*/*MseI* and *PstI*/*MseI* fragments were as described by
152 Klein et al (2000) and Menz et al (2002), respectively. Twenty *Pst*/*Mse* and 12
153 *EcoRI*/*Mse* AFLP primer combinations were used to amplify fragments in the DNA
154 samples. IRD-labeled SSR primers, obtained from LI-COR (LI-COR Inc., Lincoln, NE),
155 were used in amplification reactions as previously described (Klein et al., 1998).
156 Twenty-eight SSR primer combinations were run on the DNA samples, but only 11
157 (39%) showed transferability by producing a band in the wild species. Amplification
158 products were analyzed on a LI-COR model 4200 dual-dye automated DNA sequencing
159 system. Electrophoresis conditions were as described by Klein et al. (2000). Gels were
160 scored manually, AFLP bands that were present in *S. macrospermum* and absent in the
161 recurrent *S. bicolor* parents were scored as unique. Unique bands that were also shared
162 by backcross progeny were scored as introgression bands. The percent introgression was
163 calculated by dividing the number of introgression bands a particular backcross
164 produced by the total number of unique *S. macrospermum* bands. This number is an
165 estimate of the amount of the *S. macrospermum* genome that is present in the backcross
166 progeny. Since backcrosses were produced using the female interspecific hybrid gamete
167 there is no question as their authenticity as true backcrosses, thus introgression bands
168 can be interpreted as actually representing transfer of *S. macrospermum* DNA into the
169 progeny.
170

171 Cytogenetic Evaluation

172 Somatic chromosome spreads were prepared from root tips using a modified
173 procedure from Andras et al. (1999). Root tips were harvested into a saturated aqueous
174 solution of α-bromonapthalene for 1.75 h at room temperature in the dark. Pretreated
175 root tips were fixed in 95% ethanol/glacial acetic acid (4:1 v/v) for 24 h and stored in
176 70% ethanol. Root tips were graded based on size standards of 0.0 – 1.0 mm. The
177 terminal 1mm of several same sized root tips were dissected into a 0.5ml epitube, rinsed
178 in water several times, hydrolyzed for 10 min in 0.2*M* HCl, and rinsed 10 min in distilled
179 water. Cell walls were digested by adding 100ul of an aqueous solution of 3% cellulase
180 (Onozika R-10, Yakult Honsha Co. Ltd., Tokyo) and 1% pectolyase Y-23 (Seishin
181 Corp., Tokyo) at pH 4.5 for 1-2 h at 37ºC. Digestion times were based on empirically
182 determined values for a particular size standard. Digestion was stopped by adding 400ul
183 distilled water and centrifuging the cell suspension at 2500rpm (~400G) for 10 min.
184 Using a drawn glass pipette, the supernatant was removed being careful not to disturb
185 the pellet of cells. The cells were washed with water and centrifuged at 2500rpm for 10
186 min., twice. After removal of the final wash water, 400ul of methanol/glacial acetic acid
187 (4:1 v/v) was used to wash the cells followed by centrifugation at 2500rpm for 10 min.,
188 twice. After the final wash, all but ~50ul of the fixative was removed. The cells were
189 resuspended in the remaining fixative, 2-8ul drops were placed on clean glass slides
190 suspended over wet filter paper and allowed to dry. For chromosome counts, slides were
191 stained with Azure Blue, made permanent with Permount, and analyzed with a Zeiss
192 Universal II microscope (Carl Zeiss Inc., Gottingen, Germany). A minimum of four

193 quality spreads of highly condensed chromosomes was used to determine the somatic
194 chromosome number of individual plants.
195 Fluorescent and Genomic *in situ* hybridization (FISH and GISH) were used to
196 visualize introgression in backcross progeny. Plasmid CEN38 was used as a FISH probe
197 to visually differentiate *S. bicolor* subgenomes A and B_1 (Gomez et al., 1998; Zwick et
198 al., 2000). Genomic DNA of *S. macrospermum* and *S. bicolor* were used as GISH
199 probes to detect introgression DNA in the backcrosses and to determine whether the
200 chromosomes were recombinant. Detection of probes followed a modified protocol of
201 Jewell and Islam-Faridi (1994), as described by Hanson et al. (1995) and Kim et al.
202 (2002). Purified probe DNA was nick-translated with digoxigenin-11-dUTP or biotin-
203 16-dUTP (Roche Diagnostics, Indianapolis, IN). Slides with somatic chromosome
204 spreads were prepared as described above. Chromosomes on glass slides were denatured
205 in 70% formamide in 2X SSC for 1.5 min at 70ºC, then dehydrated in 70 (-20ºC), 85
206 (RT), 95 (RT), and 100% (RT) ethanol, for 2 min each. The hybridization mixture (25ul
207 per slide) contained 50ng labeled probe DNA, 50% formamide and 10% dextran sulfate
208 in 2X SSC. The hybridization mixture was denatured for 10 min at 95ºC and chilled on
209 ice. It was then added to the slide, sealed with rubber cement around a glass coverslip
210 and incubated overnight at 37ºC. Following incubation, the slides were washed at 40ºC
211 in 2X SSC and room temperature in 4X SSC plus 0.2% Tween-20, for 5 min each.
212 Slides were blocked with 5% (w/v) BSA in 4X SSC plus 0.2% Tween-20 at room
213 temperature. The digoxigenin and biotin-labeled probes were detected with CY3™-
214 conjugated anti-digoxigenin anti-body and fluorescein isothiocyanate (FITC)-conjugated

streptavidin, respectively. Slides were washed in 37ºC 4X SSC plus 0.2% Tween-20. Chromosomes were counterstained with 25ul DAPI with Vectashield® (Vector Laboratories, Burlingame, CA). Slides were viewed through an Olympus AX-70 epifluorescence microscope and images captured with a Macprobe® v4.2.3 imaging system (Applied Imaging Corp., Santa Clara, CA).

RESULTS AND DISCUSSION

Breeding Methodology, Cytology, and Germplasm Phenotypic Evaluation

Interspecific Hybrids: Twenty interspecific hybrids were grown and their identity was confirmed by morphology and chromosome number ($2n = 30$). At maturity, hybrids flowered but anthers were non-dehiscent. Normal I_2-KI staining pollen grains were rare and F_2 seed did not develop on 15 selfed panicles (approximately 3,000 florets). Previous attempts to recover backcross progeny using the male hybrid gamete were difficult and inconclusive (Kuhlman et al. 2008). Interspecific hybrid panicles were pollinated with *S. bicolor* pollen, mostly from NR481 but a few also with BTx623. Backcross seed development was rare: a single seed with well developed endosperm was observed but it was not viable. Thus, embryo rescue was used to recover backcross progeny. In total, 7009 florets were pollinated and dissected revealing 86 (1.2%) with embryo development of which 15 (0.2%) survived into adult BC_1F_1 plants (Figure 1).

BC_1F_1 plants: All BC_1F_1s had awns and red plant color but varied in their height and vigor (Table 1). Most BC_1F_1 plants had little to no male fertility with non-dehiscent anthers and non-viable pollen; the seed that was produced was all red in pericarp color

237 (Table 1). Most BC_1F_1 plants were backcrossed using NR481 pollen; occasionally
238 BTx623 was used when adequate supplies of NR481 pollen were unavailable. Embryo
239 rescue was not needed as 3 BC_1F_1 plants (101, 102, and 107) set viable backcross seed
240 (Table 1). Two other plants, 105 and 115, produced a single backcross seed that was not
241 viable (Table 1).
242 BC_1F_1 101 was morphologically distinct from the others; it had wider leaves,
243 larger florets, and had features reminiscent of BTx623; marker data confirmed that
244 BC_1F_1 101 was derived from BTx623 fertilization of the interspecific hybrid.
245 Phenotypic and molecular data confirmed that BC_1F_1 102 and 107 resulted from
246 fertilization by NR481. Both of these BC_1F_1s produced significantly less backcross seed
247 than did BC_1F_1 101 (Table 1). The increased seed set in BC_1F_1 101 could be due to
248 increased heterozygosity resulting from its mixed pedigree.
249 Chromosome numbers in the BC_1F_1 plants ranged from 35 to 70 (Table 1, Figure
250 1). Such high chromosome numbers resulted from irregular meiosis in the interspecific
251 hybrid (Kuhlman et al. 2008). BC_1F_1 plants with chromosome numbers between 35 and
252 39 likely resulted from transmission of 25-29 chromosomes through the female gamete
253 and 10 chromosomes through the *S. bicolor* gamete. Transmission of 25-29
254 chromosomes from plants with $2n = 30$ is best explained by the formation of a restitution
255 nucleus composed of the univalents during meiosis. Under this hypothesis,
256 chromosomes would pair at meiosis, and those undergoing recombination would form
257 bivalents at metaphase I and subsequently separate and move to the spindle poles. The
258 remaining chromosomes would form univalents, some of which might distribute

themselves to the poles via spindle attachment, while the others would remain at the metaphase I plate and other intermediate positions. In cells with a pole-to-pole distribution of univalents, a restitution nucleus would sometimes form between the two poles, and the product would contain all or most chromosomes. Meiosis II typically conserves chromosome numbers of meiosis I products, so variable chromosome numbers among restitution and partial-restitution products from meiosis I would translate to megagametophytes with various chromosome numbers. Restitution nuclei have been implicated in transmission of univalents in multiple species (Singh, 2003). The two plants with $2n = 60$ and 70 chromosomes may have been produced due to meiotic irregularities (Singh, 2003) resulting in tetraploid ($2n = 60$) female gametes. Parthenogenesis of such a "4n" egg would result in $2n = 60$ progeny or fertilization of such an egg would result in $2n = 70$ progeny. BC_1F_1 104 ($2n = 12x = 60$), is hypothesized to be a naturally produced allododecaploid. It displayed slow growth and very stiff leaves, and complete sterility; backcrosses were not recovered.

BC_2F_1 families: Three BC_2F_1 families consisting of 45 seed from the three partially fertile BC_1F_1s (101, 102, 107) were planted and evaluated. Pollen samples were taken from plants of each family and scored for pollen stainability. All three BC_2 families had significantly lower mean pollen stainability than NR481. Family 101 had higher pollen stainability than 102 and 107, which were not different (Table 2). BC_2F_1 families 102 and 107 displayed significantly lower seed set (1.3% and 1.4%) than family 101 and NR481 (87% and 94%), which were not different (Table 2). The vastly lower

seed set from families 102 and 107 made obtaining selfed seed difficult and limited the evaluation of the BC_2F_2 generation.

Chromosome number for plants within family 101 were $2n = 20$ for 14 of 15 plants analyzed; one plant was $2n = 21$. Two plants each from families 102 and 107 had $2n = 20$ chromosomes (Table 2). BC_2F_1 progeny ($2n = 20$) were produced without embryo rescue from parents that contained 36, 37, and 38 chromosomes. Whereas the restitution nucleus conferred survivability to the rescued BC_1F_1 embryos, it appears that it was selected against when embryos were not rescued and seeds were produced. Of those surveyed, 95% of BC_2F_1 plants had 20 chromosomes.

All BC_2 individuals were tall, had red plant and seed color, and a dry midrib like the recurrent *S. bicolor* parent (NR481), except the BC_2s in family 101 in which three individuals had white seed color, two individuals had juicy midribs, and one was short (102cm) (Table 2). These traits are recessively inherited and should not be present in a population of BC_2F_1 individuals whose pollen parent (NR481) is tall, red seeded, has a dry midrib, and has not been observed to segregate for these traits. Pollen contamination from a different genotype was impossible since no other genotypes were grown in the greenhouse during that time. The simplest explanation is self-pollination, however, fertile pollen was never observed. Parthenogenesis of an unfertilized egg cell is not possible as segregation was observed in selfed progeny (Table 2). Alternatively, 2n gametes ($n = 20$) could be produced via failed cytokenesis of the dyads during the second stage of meiosis (Singh, 2003). As an example, a pollen mother cell, in this case possessing 36 chromosomes with 10II and 16I at metaphase, could produce two dyad

302 cells with 10 and 26 chromosomes, assuming the univalents segregated as a restitution
303 nucleus. If cytokenesis failed during meiosis II, the sister chromatids would separate,
304 and following macrogametogenesis form an egg cell with 20 chromosomes. If this cell
305 developed into an embryo parthenogenically, it would not necessarily be 100%
306 homozygous since the chromosomes underwent recombination during meiosis I,
307 resulting in the sister chromatids being genetically different. This $2n = 20$ progeny plant
308 could not be differentiated from a selfed plant. Therefore, BC_2F_1 progeny produced
309 from BC_1F_1 101 are potentially a mix of pedigrees: backcross derived BC_2F_1s, selfed
310 BC_1F_2s, and parthenogenic progeny from diploid gametes. As separation of all
311 individuals into these classes is not possible, this generation will still be referred to as
312 BC_2F_1.

313 BC_2F_2 progeny were evaluated for visual expressions of introgression in both the
314 field and greenhouse. Overall, BC_2F_2 progeny deriving from family 101 had adequate
315 seed set and segregated for traits polymorphic between BTx623 and NR481, such as
316 seed color and plant height. This significant variability in the population made
317 identifying phenotypic evidence of introgression virtually impossible. BC_2F_2 plants in
318 families 102 and 107 showed one obvious sign of introgression: male-sterility. Female
319 fertility was unaffected as backcross seed set was normal. Partial male sterility in the
320 BC_2F_1 plants in these families was likely caused by *S. macrospermum* introgression and
321 the plants were presumed to be heterozygous for any introgression. BC_2F_2 plants were
322 expected to segregate for male-sterility, but lack of segregation suggests that the BC_2F_1
323 plants were homozygous for such introgression (Table 2). This could be possible if the

324 BC_2F_1s were actually the result of selfing, but this is unlikely as stainable pollen was
325 rarely observed. Some form of asexual reproduction, as described for family 101, could
326 also be causing progeny to be homozygous for introgression. There would also have to
327 be high selection pressure for the sterility inducing introgression as all BC_2F_1 plants
328 from these two families produced sterile progeny.
329
330 Molecular Marker Analysis of Introgression
331 The amount of *S. macrospermum* genome that was introgressed into the BC_2
332 generation was evaluated using AFLP markers. In total, 32 primer combinations
333 produced 528 AFLP markers unique to *S. macrospermum*. The total amount of *S.*
334 *macrospermum* genome detected in the BC_2F_1 generation was 26% (138 of 528 unique
335 *S. macrospermum* markers). Most introgression bands (82%) were found in single
336 individuals, while 5% were shared by between 6 and 14 BC_2F_1s. Each family possessed
337 three types of introgression: unique to that family, shared between two families, and
338 shared by all three families (Figure 2). Estimates for introgression on an individual basis
339 ranged widely from 0-18.6% (Table 2), although the amount of introgression did not
340 significantly differ on a family mean basis (0.75% - 1.07%).
341 Eleven of the BC_2F_1s from family 101 (44%) did not have detectable levels of
342 introgression, while two had the highest levels (3.7% and 18.6%). The total amount of
343 introgression detected within family 101 was high (22.9%), although it was derived
344 primarily from the two outstanding individuals. Introgression was detected in all BC_2F_1
345 individuals within families 102 and 107, but the range was narrow, from 0.38%-1.17%

346 (Table 2). The total amount of introgression detected in families 102 and 107 was 3.4%
347 and 1.5%, respectively. A majority of introgression markers detected in families 102
348 and 107 (56% and 88%, respectively) were present in multiple (4 to 6) individuals within
349 the family, indicating that common introgression sequences were inherited. Thus,
350 inheritance of introgression in these two families does not appear to be random. This
351 data in combination with the phenotypic male-sterility that is expressed by all
352 individuals in these two families suggests there was selection of gametes carrying a
353 common block of introgression. In contrast, almost half of individuals within family 101
354 had no detectable introgression and few markers were present in multiple family
355 members (3.4%, excluding individuals 206, 209, and 222). Common introgression was
356 found between the three excluded individuals, but overall introgression in the family 101
357 appeared random.
358 The two individuals that were distinctly different from the rest were BC_2F_1s 209
359 and 222, both of which were from family 101 and had 18.6% and 3.7% of the *S.*
360 *macrospermum* genome detected within their DNA. Selected SSR markers were run on
361 these DNA samples to confirm introgression. Two different SSRs confirmed
362 independent introgression of *S. macrospermum* DNA in these plants. Txp482 confirmed
363 introgression in BC_2F_1 209 but was absent in BC_2F_1 222, while the opposite
364 confirmation occurred with Txp523. Txp482 and Txp523 are located on SBI-01 of the
365 genetic map by Menz et al. (2002) at approximately 31cM and 28cM, respectively
366 (http://sorgblast3.tamu.edu). SSR markers surrounding these two locations showed that
367 no introgression had occurred in both plants. This indicates that if the introgressed SSR

368 sequences are on SBI-01, they are part of a small introgression segment. Alternatively,
369 the *S. macrospermum* SSR sequence may not have been homoeologous to SBI-01, and
370 thus be on another *S. bicolor* chromosome, or it was not introgressed into the *S. bicolor*
371 genome at all and be located on a whole *S. macrospermum* addition chromosome.
372
373 Molecular Cytogenetic Analysis
374 Multiple types of *S. macrospermum* introgression were found in the BC_2
375 generation. BC_2F_1 209 (18.6% introgression) ($2n = 20$) visibly shows two *S.*
376 *macrospermum* chromosomes and 18 *S. bicolor* chromosomes in its genome (Figure 3,
377 A). Visualization of the *S. bicolor* genome reveals that the *S. macrospermum*
378 chromosomes are non recombinant (Figure 3, B). The *S. bicolor* chromosomes,
379 evidenced by the CEN38 probe, are 10 from the A subgenome and 8 from the B_1
380 subgenome. This plant is an example of an alien substitution line: two B_1 *S. bicolor*
381 chromosomes have been replaced with two *S. macrospermum* chromosomes. The
382 introgression detected by molecular markers, including Txp482, is largely located on
383 two *S. macrospermum* alien substitution chromosomes. The cytogenetic evidence,
384 however, cannot disprove the existence of small introgression blocks within the *S.*
385 *bicolor* genome. This type of introgression has been used extensively in wheat breeding
386 where alien substitution is well tolerated by the genome (Jiang et al., 1994; Jones et al.,
387 1995; Jauhar and Chibbar, 1999). Seed set was slightly lower than the check but still
388 reasonably high (72%). Morphologically this plant appeared to be in the range of that
389 for segregation between BTx623 and NR481; therefore, no phenotypic trait can

390 presently be assigned to the alien chromosomes. It is surprising that the plant tolerates
391 this level of alien substitution as *S. bicolor* trisomic lines have been recovered (Schertz,
392 1966) but monosomic lines have not. This indicates that homoeologous chromosomes
393 from the *S. macrospermum* genome must compensate for the missing *S. bicolor*
394 chromosomes.
395 GISH using *S. macrospermum* DNA as probe reveals that BC_2F_1 222 (3.7%
396 introgression) ($2n = 21$) was an alien addition line; it had one non-recombinant *S.*
397 *macrospermum* chromosome along with 20 *S. bicolor* chromosomes (Figure 3, C and D).
398 The introgression detected using molecular markers in this plant is most likely located
399 on a single *S. macrospermum* chromosome, however, the presence of small introgression
400 blocks cannot be disproven. Txp523, which detected introgression in this plant, most
401 likely is homoeologous to a sequence on the *S. macrospermum* chromosome. This plant
402 displays no deleterious effects of the introgression in that seed set was high (85%) and
403 the plant was vigorous. One potential phenotype influenced by introgression was the
404 presence of normal and shriveled endosperm seeds produced by selfing. The
405 approximate ratio of normal to shriveled seed was not different from a 3:1 ratio ($\chi^2 =$
406 1.12^{ns}). This would be consistent with reduced seed size for progeny inheriting two
407 copies of the alien chromosome. This presumes, however, that normal segregation of an
408 alien chromosome occurs through both gametes. The fitness of gametes carrying an
409 extra chromosome is normally reduced; thus, the transmission rate of an alien
410 chromosome would also likely be low. It is possible that this phenotype is controlled by

411 the transmission of an alien chromosome, but this hypothesis needs cytological
412 verification.

413 SSR markers Txp482 and Txp523 were detected in BC_2F_1s 209 and 222,
414 respectively, but neither marker was present in both plants. This indicates that the alien
415 addition chromosome in 222 is different from both substitution chromosomes in 209.
416 AFLP data is consistent with this hypothesis as only 3 introgression markers are shared
417 out of 98 present in BC_2F_1 209 and 19 present in 222. Both SSR markers map to
418 chromosome 1 in the *S. bicolor* genome, which may indicate that the two detected *S.*
419 *macrospermum* chromosomes are both homoeologous to SBI-01, perhaps the related
420 chromosomes from subgenomes A_m and B_{1m} (Kuhlman et al. 2008). The introgression
421 estimate for 209 is much higher than 222. Introgression estimates were based on AFLP
422 markers which are mostly dominant, therefore being homozygous for an introgression
423 marker does not increase the introgression estimate. Thus, it would be unlikely for
424 BC_2F_1 209 to contain two homologous *S. macrospermum* substitution chromosomes and
425 still have a five fold increase in estimated introgression. Neither *S. bicolor* nor *S.*
426 *macrospermum* karyotypes show that broad of range for chromosome size, therefore,
427 inheritance of larger homologous chromosomes does not explain the increased
428 introgression (Wu, 1990; Kim et al., 2005a). BC_2F_1 209 most likely contains two
429 different *S. macrospermum* substitution chromosomes, both of which are different from
430 the addition chromosome in BC_2F_1 222.

431 GISH using *S. macrospermum* DNA as probe revealed BC_2F_1s 228 and 244 ($2n$ =
432 20, 20; 1.1% and 0.57% introgression, respectively) both contain two chromosomes with

433 *S. macrospermum* introgression. The introgression chromosomes also show
434 hybridization with the *S. bicolor* probe (Fig. 3, F) and strong hybridization with CEN38;
435 therefore, they are members of the A subgenome. Using morphology to identify somatic
436 chromosomes, the introgression sites appear to be located on SBI-01 homologous
437 chromosomes. These two plants are examples of introgression backcrosses, as they
438 contain *S. macrospermum* DNA introgressed into the *S. bicolor* genome. These two
439 plants show phenotypic evidence of introgression like all members of their respective
440 families (102 and 107). Individuals 228 and 244 had low selfed seed set (2.1% and
441 0.1%, respectively) and all their BC_2F_2 progeny were completely male-sterile.
442 Backcross seed set was normal. This strongly supports the hypothesis that these plants,
443 and possibly all plants in these families, are homozygous for the introgression that they
444 contain.
445 66% of the AFLP introgression bands in BC_2F_1 244 are common to BC_2F_1 228.
446 In fact, 17 of 19 BC_2F_1 plants from families 102 and 107 share some common
447 introgression with BC_2F_1 244. A portion of the introgression block present in BC_2F_1 244
448 seems to have been preferentially transmitted to most progeny deriving from BC_1F_1s 102
449 and 107. None of the 25 BC_2F_1 progeny from BC_1F_1 101 share any of the introgression
450 block found in BC_2F_1 244. This molecular evidence along with the suggestion that both
451 228 and 244 have introgression blocks on homologous SBI-01 chromosomes strongly
452 supports the hypothesis that inheritance of this introgression block was not random. It
453 appears that strong selection was operating to transmit portions of this introgression
454 block to apparently all BC_2F_1 progeny in these two families.

455 BC_2F_1 206 ($2n = 20$; 1.72% introgression) contains common introgression with
456 BC_2F_1 209. Seven of its 9 introgression AFLP markers are also detected in BC_2F_1 209.
457 Although not analyzed with GISH, this individual likely contains a recombinant
458 introgression block homologous to a portion of one of the alien substitution
459 chromosomes present in 209.
460
461 SUMMARY
462 Introgression breeding utilizing the tertiary gene pool species *S. macrospermum*
463 has resulted in the recovery of $2n = 20$ chromosome backcrosses that contain wild
464 species introgression. BC_1F_1s were successfully recovered using the female hybrid
465 gamete in combination with embryo rescue. Chromosome numbers were high and
466 sterility a problem; however, viable BC_2F_1 seed was set under backcrossing on 20% of
467 the BC_1 plants. It is unclear what proportion of BC_2F_1 individuals were produced
468 through sexual backcrossing versus parthenogenesis of 20 chromosome egg cells, but
469 both likely occurred.
470 Molecular markers verified that BC_2F_1 individuals contained *S. macrospermum*
471 introgression and measurements were between 0 and 18.6%. Molecular cytogenetic
472 techniques, FISH and GISH, revealed that the introgression in the BC_2F_1 plants was of
473 three types: alien substitution, alien addition, and alien introgression lines. Male-sterility
474 was the only obvious phenotypic trait observed that is likely caused by the introgression
475 DNA.

476 Family differences were apparent in this germplasm. BC_1F_1 101 and its BC_2
477 progeny showed the highest levels of fertility compared with families 102 and 107.
478 BC_2s from this family were the only examples of alien substitution and addition lines
479 observed. It is unknown whether the mixed pedigree of BC_1F_1 101 is the cause of the
480 increased fertility but it is a reasonable hypothesis. The family may have possessed a
481 mix of alleles that facilitated recovery of alien addition and substitution lines as well as
482 buffered the deleterious effects of recovered introgression. Such a hypothesis would
483 suggest that using a complex and highly heterozygous population in introgression
484 breeding may maximize the amount of recovered introgression as well as reduce the
485 associated fertility problems.
486 The germplasm produced by from this investigation confirm that introgression
487 and recovery of recombinants is possible through wide hybridization in sorghum. The
488 introgression described herein documents an approach to introgression in sorghum that
489 may not be limited to the Sorghum species. In the case of *S. macrospermum*, the value
490 will only be known if derivatives are characterized. Using this research as a starting
491 point, the true value of *S. macrospermum* genetic diversity can be determined.
492
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628

Table 1. Chromosome number and phenotypic data of BC_1F_1 individuals ((*S. bicolor* x *S. macrospermum*) x *S. bicolor*) recovered using embryo rescue

BC_1F_1	(2*n*)	HT†	Total Seed	Seed Set (%)
101	37	244	126	2.99[A]
102	36	305	28	1.65[B]
103	70	244	0	0
104	60	198	0	0
105	39	457	1	0.06
106	38	305	0	0
107	38	366	36	1.94[B]
108		61	0	0
109	38	366	0	0
110	39	366	0	0
111		183	0	0
112	36	305	0	0
113	38	274	0	0
114	35	198	0	0
115		183	1	0.36

†HT is height (cm). Seed set is after pollination by *S. bicolor*.
Seed set percentages followed by different letters are significantly different ($p<.05$)

629

630

Table 2. Phenotypic data and *S. macrospermum* introgression estimates of BC_2F_1 individuals ((*S. bicolor* x *S. macrospermum*) x *S. bicolor*) and the recurrent parent. Phenotypic data for BC_2F_2 progeny are given for some individuals.

		Individual BC_2F_1 Plant Data										BC_2F_2 Progeny Data			
BC_1 Family	BC_2F_1	2*n*	DY†	PL	SD	AW	HT	MR	% INT‡	% PS	% SS	HT§	AW	SD	Mean % SS¶
101	201	20	62	R	R	Y	102	D	0.38	62.6	95.0	S	-	R	-
	202	20	57	R	R	N	193	J	0.00	-	95.0	SEG	-	R	-
	203	20	55	R	R	N	183	D	0.57	63.0	73.0	SEG	-	SEG	-
	204	-	55	R	R	Y	180	D	0.00	70.4	95.0	SEG	-	SEG	-
	205	-	-	R	R	N	196	D	0.19	72.7	80.0	T	-	R	-
	206	20	-	R	R	N	168	D	1.72	40.4	56.0	T	-	R	-
	207	20	56	R	R	N	175	D	0.00	55.8	95.0	T	-	SEG	-
	208	-	55	R	R	N	157	D	0.00	-	95.0	SEG	-	SEG	-
	209	20	-	R	R	Y	168	D	18.56	-	72.0	T	-	SEG	-
	210	-	56	R	R	N	124	D	0.19	-	95.0	SEG	-	SEG	-
	211	20	58	R	R	Y	180	D	0.19	-	95.0	T	-	SEG	-
	212	20	43	R	R	N	160	J	0.19	56.8	95.0				
	213	20	41	R	R	N	224	D	0.00	-	88.0				
	214	20	41	R	R	Y	206	D	0.00	-	95.0				
	215	20	39	R	R	Y	201	D	0.00	-	75.0				
	216	-	48	R	R	N	211	D	0.39	-	95.0				
	217	-	40	R	W	N	165	D	0.00	-	95.0	SEG	SEG	W	57
	218	-	43	R	R	N	163	D	0.00	57.1	84.0				
	219	-	41	R	W	Y	224	D	0.00	-	95.0	SEG	Y	W	52
	220	20	39	R	W	Y	198	D	0.00	-	82.0	T	Y	W	63
	221	20	39	R	R	Y	193	D	0.19	-	95.0				
	222	21	40	R	R	N	206	D	3.66	-	85.0				
	223	20	40	R	R	N	135	D	0.19	-	95.0				
	224	-	41	R	R	N	241	D	0.19	-	78.0				

	225	-	45	R	R	N	249	D	0.19	49.4	82.0				
	Mean		**47**	**R**			**183**		**1.07**	**58.7**	**87.4**				**>50**
102	226	-	41	R	R	Y	234	D	1.14	-	0.1	T	Y	-	0
	227	-	44	R	-	Y	188	D	1.17	17.9	0.0				
	228	20	41	R	R	Y	201	D	1.14	15.2	2.1	T	Y	-	0
	229	-	43	R	R	N	178	D	0.57	-	0.6	T	Y	-	0
	230	-	45	R	R	Y	224	D	0.38	-	0.1	T	Y	-	0
	231	-	43	R	R	Y	229	D	0.95	51.5	1.5	T	Y	-	0
	232	-	42	R	R	N	226	D	0.76	11.5	4.5	T	Y	-	0
	233	-	42	R	R	N	173	D	0.76	4.0	0.1				
	234	-	44	R	R	Y	211	D	1.14	22.1	3.0	T	Y	-	0
	235	20	45	R	R	Y	224	D	0.97	10.0	1.3	T	Y	-	0
	247	-	43	R	R	N	170	D	0.76	-	1.0	T	Y	-	0
	Mean		**43**	**R**	**R**		**206**	**D**	**0.88**	**18.9**	**1.3**				**0**
107	237	-	44	R	R	Y	221	D	0.38	-	0.1	T	Y	-	0
	238	-	44	R	R	N	203	D	1.16	41.6	5.5	T	SEG	-	0
	239	-	43	R	R	Y	170	D	0.76	13.4	1.3	T	Y	-	0
	240	-	43	R	R	N	203	D	0.58	35.1	3.4	T	SEG	-	0
	241	-	46	R	R	N	218	D	0.95	-	0.3	T	SEG	-	0
	242	20	45	R	-	N	216	D	0.76	-	0.0				
	243	-	44	R	R	Y	196	D	0.77	8.6	0.5	T	Y	-	0
	244	20	43	R	R	N	216	D	0.57	0.0	0.1	T	Y	-	0
	Mean		**44**	**R**	**R**		**191**	**D**	**0.74**	**19.7**	**1.4**				
NR481	**Mean**	**20**	**57**	**R**	**R**	**Y**	**206**	**D**	**0.00**	**88.3**	**94.2**				
	LSD(.05)		6.1				36.6		2.68	15.8	8.4				
	ANOVA#		**				NS		NS	**	**				

† DY, PL, SD, AW, HT, MR, PS, SS are days to flowering, plant color, seed color, awns, height (cm), midrib, pollen stainability and seed set

respectively

‡ % INT is introgression, the percent of the *S. macrospermum* genome detected via AFLP markers in the respective plant

§ HT in the BC_2F_2 generation potentially segregated for dwarfing genes, S is short, T is tall, and SEG is segregating

¶ Seed set was not measured for BC_2F_2 progeny from plants 201-211 as these were field evaluated in Weslaco, TX, however seed was harvested from each plant and no sterile plants were found. All other BC_2F_2 evaluation was carried out in the greenhouse.

Analysis of variance between mean values for families and check, not individuals

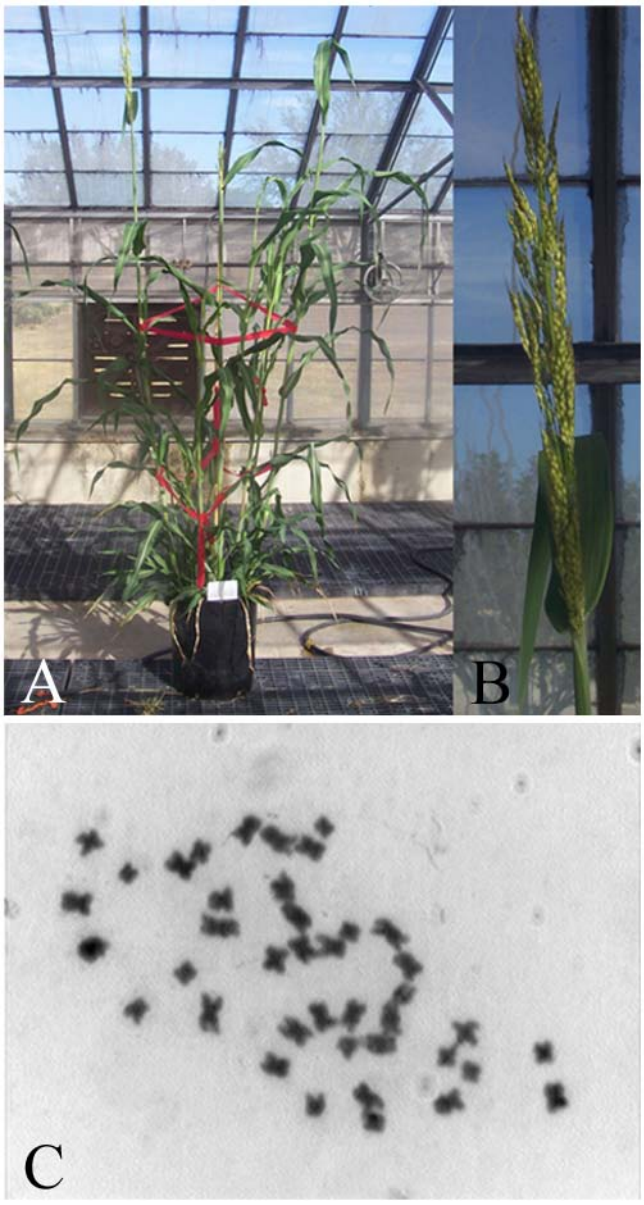

Figure 1. Interspecific BC_1F_1 generation with pedigree: (*S. bicolor* x *S. macrospermum*) x *S. bicolor*. (A) Vigorous growth of adult BC_1F_1 101 with (B) large panicle at maturity. (C) Somatic chromosome spread of BC_1F_1 106 with $2n = 38$ chromosomes.

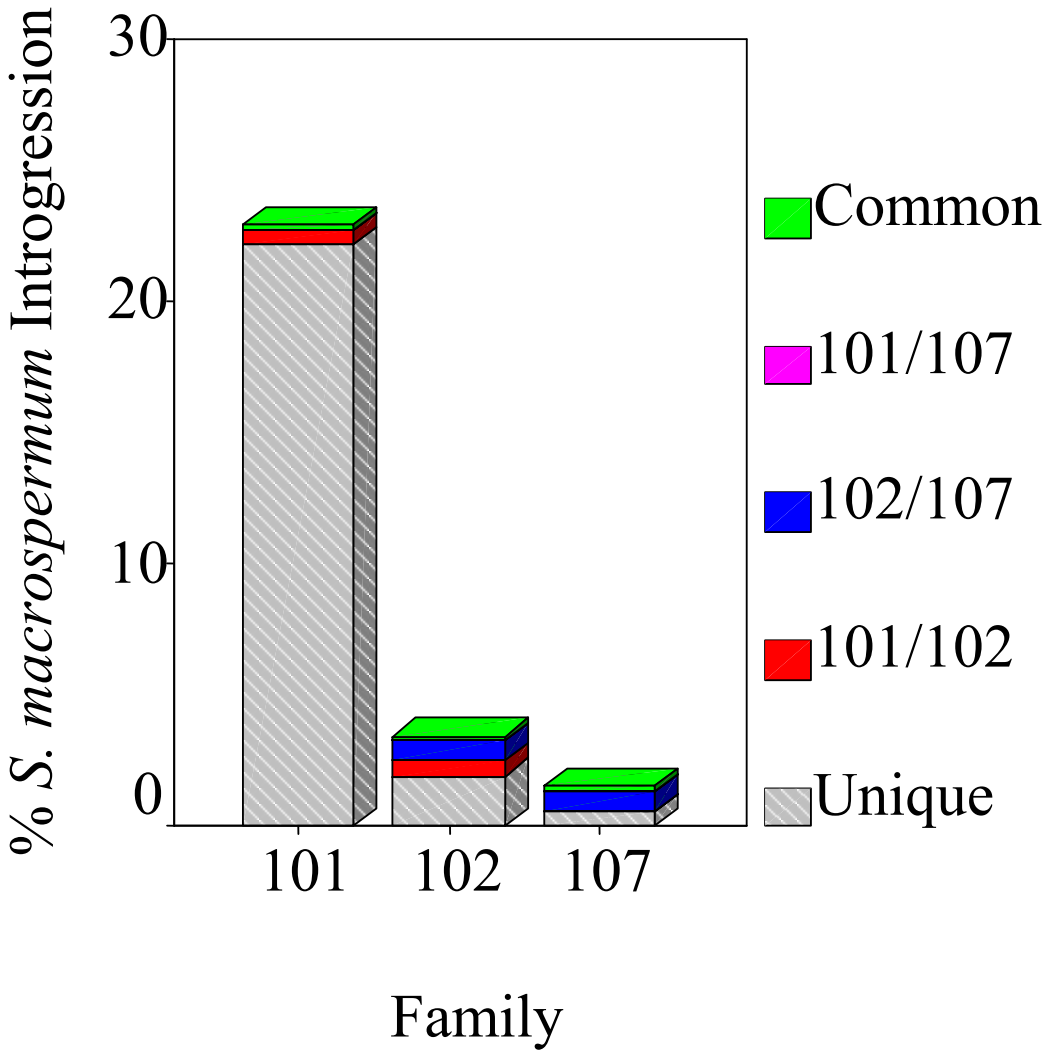

Figure 2. Graph depicting *S. macrospermum* introgression, as detected using AFLP markers, of BC_2F_1 individuals summed by family. Stacked bars represent introgression that is unique to a family, shared by two families, or common to all three families.

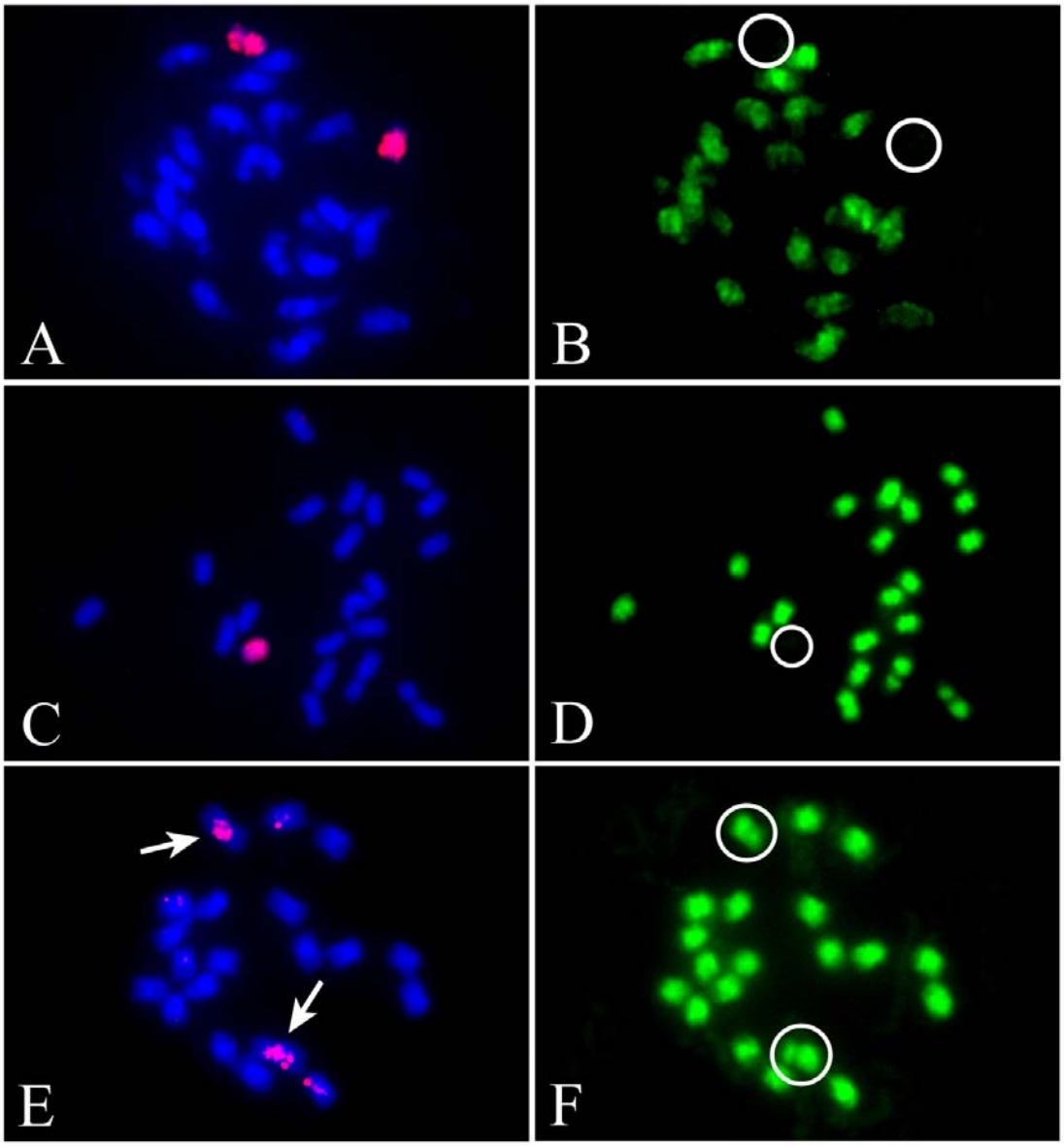
A
B
C
D
E
F

Figure 3. Genomic *in situ* hybridization of somatic chromosome spreads from introgression BC_2F_1 generation. (A, C, E) Chromosomes hybridized with *S. macrospermum* GISH probe (red) and stained with DAPI (blue). (B, D, F) Chromosomes hybridized with *S. bicolor* GISH probe (green). (A) BC_2F_1 209 ($2n = 20$) showing two chromosomes with significant *S. macrospermum* hybridization (red), (B) lack of *S. bicolor* hybridization (circles) indicates they are non recombinant whole *S. macrospermum* chromosomes. (C) BC_2F_1 222 ($2n = 21$) showing one chromosome with significant *S. macrospermum* hybridization (red), (D) lack of *S. bicolor* hybridization (circle) indicates it is a non recombinant whole *S. macrospermum* chromosome. (E) BC_2F_1 244 ($2n = 20$) showing two chromosomes with *S. macrospermum* hybridization sites (arrows) which also show (F) *S. bicolor* hybridization (circles) indicating these are recombinant chromosomes with *S. macrospermum* introgression.