

From: [Bill Rooney](#)
To: ["Carlos Ludlow"](#)
Subject: RE: VISIT
Date: Saturday, September 26, 2009 2:33:00 PM
Attachments: [09.26.09 Trip Report by William L.docx](#)

Carlos:

Please find attached trip report that summarizes some of my observations and recommendations.

I enjoyed the visit. If you have any questions 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: Carlos Ludlow [mailto:cludlow@bioe.com.mx]
Sent: Thursday, September 10, 2009 7:46 AM
To: 'Bill Rooney'
Subject: RE: VISIT

Very good.

Sergio will arrive by the same time. I'll pick up both of you.

We'll arrange for all transportation and lodging.

Is it ok if we reimburse the flight cost in cash directly to you, as well as your fee? It will add up to [REDACTED]

Saludos.

=====

Carlos Ludlow

Coordinador General

BIOENERGIA AGROINDUSTRIAL

044 55 5451 6964

cludlow@bioe.com.mx

De: Bill Rooney [mailto:wlr@tamu.edu]
Enviado el: jueves, 10 de septiembre de 2009 06:36 a.m.
Para: 'Carlos Ludlow'
Asunto: RE: VISIT

Carlos:

I have reservations to fly to Leon on Thursday afternoon and return to Houston on Saturday morning. Please see attached file for the details.

I assume that you will arrange transportation and lodging as appropriate for my stay.

I look forward to meeting and visiting with you.

regards,

bill

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

-----Original Message-----

From: Carlos Ludlow [mailto:cludlow@bioe.com.mx]
Sent: Tuesday, September 08, 2009 7:30 PM
To: 'Bill Rooney'
Cc: 'Jesus Campos'; Sergio Serna Saldivar; 'Roberto Macias'
Subject: RV: VISIT

Dear Bill,

Please advise the flights options, so we can prepare the visit to the sweet sorghum trial areas.

Saludos

=====

Carlos Ludlow

Coordinador General
BIOENERGIA AGROINDUSTRIAL
044 55 5451 6964
cludlow@bioe.com.mx

De: Carlos Ludlow [mailto:cludlow@bioe.com.mx]
Enviado el: viernes, 04 de septiembre de 2009 05:45 p.m.
Para: 'Bill Rooney'
Asunto: RE: VISIT

Perfect.

Advise flights schedules.

Saludos

=====

Carlos Ludlow

Coordinador General
BIOENERGIA AGROINDUSTRIAL
044 55 5451 6964
cludlow@bioe.com.mx

De: Bill Rooney [mailto:wlr@tamu.edu]
Enviado el: viernes, 04 de septiembre de 2009 05:39 p.m.
Para: 'Carlos Ludlow'
Asunto: RE: VISIT

Carlos:

The meeting is confirmed. With your approval, I will make the following reservations on Continental Airlines. Right now, the cost of the ticket is \$583.27

On this schedule, I will be available for discussions Thursday evening and all day on Friday.

I will make the reservations upon your agreement.

regards,

bill

Flight Details:				
Depart: 2:40 p.m. Thu., Sep. 24, 2009 Houston, TX (IAH - Intercontinental)	Arrive: 4:43 p.m. Thu., Sep. 24, 2009 Leon/Guanajuato, Mexico (BJX)	Travel Time: 2 hr 3 mn	OnePass Miles/ Elite Qualification*: 756 /100%	Flight: CO2232 Aircraft: Embraer RJ145 Fare Class: Economy (W)
Continental flight 2232 operated by ExpressJet Airlines, Inc. dba Continental Express.				
Depart: 7:00 a.m. Sat., Sep. 26, 2009 Leon/Guanajuato, Mexico (BJX)	Arrive: 9:00 a.m. Sat., Sep. 26, 2009 Houston, TX (IAH - Intercontinental)	Travel Time: 2 hr 0 mn	OnePass Miles/ Elite Qualification*: 756 /100%	Flight: CO2011 Aircraft: Embraer RJ145 Fare Class: Economy (W) Meal: Snack No Special Meal Offered.

Dr. William L. Rooney
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Chair, Plant Release Committee
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979 845 2151

-----Original Message-----

From: Carlos Ludlow [mailto:cludlow@bioe.com.mx]

Sent: Friday, September 04, 2009 3:18 PM
To: 'Dr. William L. Rooney'
Cc: 'Jesús Campos Orozco'; 'Roberto Macías Rodríguez'; 'Alvaro Pérez Perez'; Sergio Serna Saldivar; 'Ricardo De la Torre Hernández'; 'Margarito Reynaga Vielma'; 'Humberto Ascencio'
Subject: RE: VISIT

Dear Bill,

Can we confirm your visit to make all the arrangements?

Please advise about flights

Saludos

=====

Carlos Ludlow
Coordinador General
BIOENERGIA AGROINDUSTRIAL
044 55 5451 6964
cludlow@bioe.com.mx

De: Carlos Ludlow S [mailto:cludlow@bioe.com.mx]
Enviado el: miércoles, 02 de septiembre de 2009 07:27 p.m.
Para: Dr. William L. Rooney
CC: Jesús Campos Orozco; Roberto Macías Rodríguez; Alvaro Pérez Perez
Asunto: Re: VISIT

Dear Bill,

Confirmed for those dates.

Please advise your preferred flights. We can buy directly, or reimburse, as you prefer.

I'll send you a program. I'll like to have an extensive presentation from your findings and experience.

Saludos

Carlos Ludlow

Enviado desde mi oficina móvil BlackBerry® de Telcel

From: "Bill Rooney"
Date: Wed, 2 Sep 2009 18:53:52 -0500
To: 'Carlos Ludlow' <cludlow@bioe.com.mx>
Subject: RE: VISIT
Carlos:

Do you have an update on the feasibility of Sept 24-26?

It will work for me, if I can leave early on Saturday, Sept 26.

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: Carlos Ludlow [mailto:cludlow@bioe.com.mx]
Sent: Friday, August 28, 2009 10:33 AM
To: 'Bill Rooney'
Cc: 'Jesus Campos'; Sergio Serna Saldivar
Subject: RE: VISIT

Bill,

So, please consider traveling Thursday 24 and returning sat 26 september.

If you like we can arrange for some tourist visits in Guanajuato city for Saturday morning.

Please advise your desired flights.

I am asking all people involved from our side, including Dr. Serna, to confirm their availability. I'll confirm you next Tuesday at the most late.

Saludos and thanks.

=====

Carlos Ludlow

Coordinador

BIOENERGIA AGROINDUSTRIAL

Dial Mob.from USA: +52 1 55 5451 6964

cludlow@bioe.com.mx

De: Bill Rooney [mailto:wlr@tamu.edu]

Enviado el: viernes, 28 de agosto de 2009 06:55 a.m.

Para: 'Carlos Ludlow'

Asunto: RE: VISIR

Carlos:

The timeline Thurs pm to Sat am is good, but I can not travel Sept 17-19 due to meetings in College Station

The earliest dates for both schedules is the week of Sept 21.

If I leave Thurs pm and return Sat am, then that would be 1.5 consulting days. The fee would be \$2100 + travel expenses.

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: Carlos Ludlow [mailto:cludlow@bioe.com.mx]

Sent: Thursday, August 27, 2009 5:56 PM

To: 'Bill Rooney'

Subject: RE: VISIR

Bill,

If you can flight Thursday noon and arrive to Leon by late afternoon, we can work all Friday and you can flight back Saturday.

Would that be possible? Week of Sept 14 will be better or sept 21. The sooner the best you can see the plantations.

Would that be one day or two days consulting fee?

Please advise

=====

Carlos Ludlow

Coordinador General

BIOENERGIA AGROINDUSTRIAL

044 55 5451 6964

cludlow@bioe.com.mx

De: Bill Rooney [mailto:wlr@tamu.edu]

Enviado el: jueves, 27 de agosto de 2009 05:36 p.m.

Para: 'Carlos Ludlow'

Asunto: RE: VISIR

Carlos:

Thanks for your note.

My experience is primarily focused on sweet sorghum production, biology, genetics, and physiology. Based on my interaction with industry, I know a fair amount regarding harvest and harvest logistics.

My schedule is not so easy; I have to teach on Tuesday and Thursday, and since classes don't start until next week, I'm not sure which day is best for me to miss.

The first available time is the week of September 21, although I will not be able to pick the specific dates until classes begin next Tuesday.

I can fly to either Leon or Mexico City - Continental flies direct to both on a daily basis, so I will travel to the location most beneficial to you.

I'm available for a call tomorrow afternoon. Next week, I can join a conference call in the evening hours (after 6pm CDT) anyday except Friday.

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: Carlos Ludlow [mailto:cludlow@bioe.com.mx]
Sent: Wednesday, August 26, 2009 4:26 PM
To: 'Bill Rooney'
Cc: 'Dr. Sergio Román Othón Saldivar'; 'Jesús Campos'; 'MACIAS RODRIGUEZ Roberto Enrique'
Subject: VISIR

Dear Bill,

Thanks for your prompt response.

Our group is in the process of setting up the complete (My God!) value chain having its center in the bioethanol, that Mexico is heading to use by end of 2010. You very imagine the magnitude of the project, starting with plantations (and seeds and fertilizers, etc) and extending to biomass bagasse, hot water, etc. utilization, We will talk a lot on this issue

Our best option is the sweet sorghum, which we have bring studying for two years. After a whole day session, with Sergio Serna we see this option more and more as the way to go.

This same week we are harvesting the first samples of the 20 varieties under study, so a visit from you as early as possible will be very important.

When and how would to suggest we establish this relation? On dates, we are open, excluding Sept 9 to Sept 16.

You can flight either to Mexico City, where we can meet with other investors, or to Querétaro Airport or Bajío Airport (City of Leon in Guanajuato State.)

Please acknowledge and give a proper time for a conference call and for a two day visit.

Muchos saludos

=====

Carlos Ludlow
Coordinador General
BIOENERGIA AGROINDUSTRIAL
044 55 5451 6964
cludlow@bioe.com.mx

De: Dr. Sergio Román Othón Saldivar [mailto:sserna@itesm.mx]
Enviado el: miércoles, 26 de agosto de 2009 03:55 p.m.
Para: cludlow@bioe.com.mx
CC: 'Bill Rooney'
Asunto: FW:

Dear Bill: I am forwarding your email to Ing. Carlos Ludlow (cludlow@bioe.com.mx) who is the leader of the sweet sorghum ethanol project. Thanks for your prompt response and willing to accept their invitation to visit Queretaro. Sergio

From: Bill Rooney [mailto:wlr@tamu.edu]
Sent: Miércoles, 26 de Agosto de 2009 01:30 p.m.

To: 'Dr. Sergio Román Othón Saldivar'
Subject: RE:

Sergio

Thanks for the note - Megan and the boys are fine. Will is starting at TAMU as a freshman, co majoring in Ag Engineering and Poultry Science. Time moves on.

Yes I would be interested in seeing what they are doing. If you can put me in contact with them, that would be great.

My best to you and your family.

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: Dr. Sergio Román Othón Saldivar [mailto:sserna@itesm.mx]
Sent: Wednesday, August 26, 2009 11:16 AM
To: 'Bill Rooney'
Subject:

Dear Bill: hope you, Megan and the family are doing OK. I am contacting you because the JADE Bioethanol group wants to invite you to Queretaro to talk about weat sorghum and biomass sorghum. FYI they are running the second cycle of 16 entries of sweet sorghums from ICRISAT. They are willing to pay your expenses and the consulting fee. Are you interested? Please let me know. Sergio

Trip Report by William L. Rooney

Destination: Leon Mexico to survey sweet sorghum/grain sorghum research for a planned ethanol plant being developed by Bioenergia Agroindustrial.

Summary: On September 24/25, a group from Bioenergy hosted me to survey their activities in research on sweet sorghum to determine if sweet sorghum production is feasible in the Bajio and to review current collaborative research activities with INIFAP.

Activities:

September 24. I arrived in the late afternoon and met the Bioenergy group at the Leon airport. The first trials were observed at the INIFAP research station near Celaya GTO. At this location, I observed sweet sorghum production trials which had been harvested for biomass and composition data as well as seed production of the most promising cultivars. The milling process was also demonstrated.

September 25. We visited two field trials near Puroandiro, MIC. One trial had been harvested (except for one late cultivar). This trial was located on the hillside. A second location was planted in the Valley. All trials in all locations contained the same approximately 20 cultivars (most derived from ICRISAT). We returned to Puroandiro for a seminar session to the group by both Dr. Miguel Hernandez and myself on our experiences with sweet sorghum production in Mexico and US, respectively. Afterwards, we drove to a proposed plant location near Morelia, MCH. Upon completion, I returned to Silao for an early Saturday morning return to Texas.

Observations/Suggestions:

1. The six field trials of primarily ICRISAT sweet sorghum germplasm represent an excellent initial starting point for testing both the applicability of sweet sorghum to the Bajio of Mexico as well as identification of the most promising cultivars for production. Statistical analysis of the data is needed before you can make any real conclusions.
2. Of the two trials that I observed directly, both appeared to be of excellent quality and they should provide good information. I will assume that the others will be of similar quality; statistical analysis of each trial will provide some indication of that and I also assume that Bioenergy has visited these sites and personally observed them for their usefulness and value. Based on the methodology being used:

- a. I think that biomass yields are likely to be slightly higher (10-15%) than what would be observed in commercial production. It is common in small plot research work to overestimate commercial production because the trial is managed with much more detail.
- b. I think that juice yields may actually be underestimated as the small mill being used is simply not as efficient as commercial mills are at extracting both sugar and water from plant biomass.
- c. I think that sugar yields may be slightly lower than typical. Miguel was harvesting 15 days post anthesis. This solves the grain issue (see below) because it has not had

enough time to fully develop any meaningful grain BUT sugar concentrations usually don't peak until approximately 21-18 days post flowering.

3. The issue of grain management is critical. Since you will be using grain sorghum as a feedstock and these cultivars (and future hybrids) do have significant grain yield potential. The best option is dependent on processing options, harvesting options and relative importance of grain vs. biomass.
 - a. Harvest early (<15 days post-anthesis or earlier); grain development will be minimal and should not influence any of the sugar harvest and extraction processes.
 - b. Harvest at optimum 21-35 days post-anthesis. At this maturity the grain is too immature for storage. In this option, the process methodology must be developed to convert any starch into sugar for ethanol conversion.
 - c. Harvest at grain maturity (> 40 days post-anthesis). At this point the grain is mature and if the moisture content is < 14% it can be stored for processing exactly like grain sorghum.

Recommendations/Future Work

1. Immediate Recommendation (using the trials that you now have). The issue of grain versus sugar is critical – given that the trial in Puruandiro is still actively growing, I would recommend weekly (or every other week) that samples be collected to establish the relationship of grain maturity, sugar concentrations (AND YIELDS) and sugar stability into the fall season. This should be continued until the first frost kills the plant. This information will allow you to understand the stability of sugar within the crop over time (important for harvest timing) and the relationship between grain production and sugar yields (remember that sugar yields are more important than concentration). I would not change methodology at this time; allow Miguel to measure as he has.
2. Future Recommendations (Next Year)
 - a. Plant population study – The populations this year were likely too high, I would recommend the development of a small population density study to optimize population using two of the best cultivars from this year's test. This can be developed over the winter for planting next year.
 - b. Obtain additional germplasm for testing – Cultivars are fine for testing but eventually it will be necessary to utilize sweet sorghum hybrids as they will have greater yields and it will be easier to purchase seed. Two companies in the U.S. are developing sweet sorghum hybrids: Ceres and Advanta. I recommend that you contact these groups and request cooperative testing of their sweet sorghum hybrids.
 - c. Stagger planting studies – These trials are absolutely necessary to understand the timing and logistics of planting so that supply is available to the plant on a continual basis. This should involve material of different maturity
3. I did not notice much sorghum growing in the immediate vicinity of the plant site that we visited in Michoacan. While that is not a problem for grain sorghum (easily transported), this could be a significant problem for sweet sorghum. It is critical to assess the feasibility and economics of

producing sweet sorghum within 20-30 km of the proposed site. Distances further than that maybe possible but only if a majority of the biomass is nearer the plant.

4. With regard to my further interaction with Bioenergia Agroindustrial, I am willing to provide assistance for agronomic research and cultivar selection on a consulting basis. I expect that most of this work would be on an hourly basis, helping to interpret data/results and to develop agronomic tests that can then be implemented by the INIFAP or in house agronomists.