GEM Cooperators Meeting
December 7, 2011
Hyatt Regency Hotel – Chicago, IL

Welcome:
Meeting was called to order at 8:35 AM by TSG Chair – Tom Hoegemeyer – There were 60 attendees at the meeting.

Minutes (Natalia de Leon):
Natalia de Leon reviewed the minutes of the December 8, 2010 GEM Cooperator’s meeting. Motion to approve the minutes was made by David Butruille, and seconded by Jim Parks. Minutes accepted.

Election of TSG Members (Tom Hoegemeyer):
Freeman Whitehead completed his second three-year term as members of the TSG. Tom Hoegemeyer thanked Freeman for his outstanding contribution to the group. Tom Koch from AgReliant was nominated by the TSG to replace Freeman. Tom Hoegemeyer proceeded to ask for nominations from the floor. Seeing none, Tom entertained a motion to have Tom Koch replace Freeman. Motion made by Dave Mies and seconded by Jim Parks. Nomination was accepted.

Modifications to the GEM By-Laws (Tom Hoegemeyer):
The GEM by-laws were modified and approved by the TSG. Tom Hoegemeyer shared with the cooperators a quick highlight of the changes that were made to this document which primarily revolved around adaptations to the current format of the group. Briefly, in the past the group had a chair, a vice-chair and a secretary. Currently, the group has an elected chair and the group appoints a note-taker or two for each meeting. Also, each large company (Pioneer, Monsanto, Syngenta) has a permanent representative on the GEM TSG.

GEM Annual Report (Mike Blanco and Matt Krakowski):
There currently are 245 total GEM releases, 10 new this year (6 from Ames, and 4 from Raleigh). From those, six are GEM Ames releases in 2012. A total of 136 new breeding crossed were made in Ames in year 2011.
The AD and DH update: A total of 415 DH lines derived from 133 populations (81 races) are in the pipeline and may be available in the future. Ames ran 501 rows of allelic diversity for advancement form 11 different races.
The list of Public Cooperators Reports include Iowa State Univ, NDSU, Texas A&M U, Truman State U., UIUC, U of WI

Mike also thanked the staff at the Ames station which includes Fred Engstrom (trial manager), Andrew Smelser (nursery manager) and Mack Shen (IT specialist).
Matt Krakowski provided an update for the NC GEM project. He described the personnel currently working at the station which includes Matt, Dale, and Major, Wayne Dillard and William Hill. Two grad students include Oliver Ott and Jill Recker.

This site run approximately 6000 yield trial plots in NC on 5 locations in the state. They had mixed results with low yields and some locations severely affected by drought. In addition to these rows, the site coordinates an additional 5000 plots that are run through cooperators. The trend on number of plots was from 10,000 in 2006, to 12,000 in 2010 and expected to be back to 10,000 in 2012. The contribution from cooperators, both public and private have gone down, although number of plots from the site itself has gone slightly up.

Germplasm in the trials run by this site includes families derived from GEM breeding crosses, GEM released lines, tester combinations, GEM breeding crosses and potential new germplasm for breeding crosses.

The nursery comprised 4000 rows plus 1100 rows in isolation in 2011, those included GEM breeding croses for S2 development, GEM S1 and S2 development, AD, GEM X GEM crosses GEM bulk increases for released lines and potential releases and new breeding cross development.

Major Goodman commented on the relative low performance of Ex-PVPs evaluated through many years of data at Raleigh, the GEM lines evaluated appear substantially superior. No specific experiment comparing them head-to-head has been done, but these observations are the results of trials using same checks and run in side-by-side fields.

Tom asked the group to make sure cooperators feel free to provide suggestions and needs and interests to the TSG at any time.

**Yield Test Results and Recommendations – Midwest and Southeast** (Mack Shen):

It was noted that people from 132 countries have visited the GEM site, most GEM site users are GEM cooperators. A total of 64 images of GEM lines from 2005 to 2011, disease data from 2007 to 2011, data of observation of breeding crosses from 2009 to 2011 are currently available on the GEM site.

There were 51 experiments conducted from the Ames location with between 5 to 8 replications each for a total of 17,000 plots. One experiment was lost and eight experiments with more than one rep were also lost. Total number of reps lost equal 41.

Very high CVs were observed in 2011 (average was 13.5%) due to weather.

Mike described yield results from IA. Decisions were made on two years of data. A set of 5 checks were used in every trial ranging from 109 to 119 RM. He described releases GEMS-0224 (first Venezuelan release from GEM), GEMN-0225 (which was from BR105, from Suwan exotic germplasm. This was the – second NSS BR105 released by GEM), GEMS-0226 (which was from BR106, from tuxpeno germplasm, GEMS-0227 and, GEMS-0228 (which were both from NEI9004 from a Thailand tropical inbred ),and GEMN-0229 (from SAMN126 (San Martin), from Peru. GLS description – above average GEMN-0194 and GEMN-0195, ~26 lines all years SLB description (J. Dodd and P. Balint-Kurti) – 9 different releases were highlighted.

NLB – above average included GEMN-0195 and GEMN-0197. –
The Diploidia Ear Rot screening trials managed by B. Dolezal of Pioneer was briefly discussed. Some of the NEI9004 material looked very good for Diplodia in 2011. GEMS

Matt summarized results for 2011 Raleigh:

He pointed out the performance of GEMN-0097 that has the highest Yield to moisture ratio (Y/M) and was higher than the checks. GEMS-0113 (from IA) was quite resistant to GLS and also has yield.

Third year trial GEM family (EXL7) – The new releases from Raleigh appeared in this trial and included GEMN-0230, GEMN-0231, and GEMN-0233, which had good Y/M for all of them.

Presentation by Wenwei Xu – Breeding for Abiotic Stress. Using exotic germplasm to improve abiotic stress tolerance.

He talked about the importance of water and discussion about improving crops for resistance to drought. In the Lubbock area, farmers use 54% of their income to pay for irrigation. Drought is a very complex trait. He indicated the importance of selected for resistance to heat. Wenwei described the utility of the GEM and CIMMYT materials. He provided a list of favorites – 15 different breeding crossed. He pointed out to problem of heat susceptibility in GEM lines, and suggested to select for heat tolerance first, and then focus in drought. When materials are evaluated under well watered conditions, the GEM materials and checks are similar, under drought conditions, GEM materials tend to yield better than the commercial check.

Materials generated using GEM materials have good potential for silage due to the big size plant port.

Wenwei described the importance of selecting against aspergillum. His approach is to improve materials for drought and heat tolerance, improve corn earworm resistance and that will help with aflatoxin.

Wenwei also described the Serat project and its work related to aflatoxin. He also described the potential of teosinte as a source of rust resistance. He described that Southern rust has reached College Station, TX and some of the teo-lines (crosses by teosinte) appear quite resistant to Southern rust. And some of them provide good yield characteristics.

Presentation by Jim Dodd – Trends in Corn Diseases –

He provided a very interesting overview of the development of important diseases in the UW since the early 1970’s. He indicated that the trends are:

- Pathogens have genetic variability too and they have large population sizes
- Popular hybrids have selective vulnerability
- Need to alert to unexpected disease
- Corn diversity is plentiful and can meet any disease

He indicated that most corn diseases resistance is affected by 3-4 genes. Resistance in hybrids usually the intermediate between the two parents and the majority of corn genotype are moderately resistance, intermediate or moderately susceptible. He recommended to take the
worst rating of two reps and not the average, and to apply inoculum pressure that allows
distinctions and prefers to use a 1-5 rating scale (rather than 1-9).
He also provided an interesting distribution of resistance for 2011 GEM entries as susceptible,
intermediate and resistant for four diseases-Goss’s Wilt, NLB, SLB, and GLS. Among the GEM
material evaluated, 75% of the entries were resistant to Goss’s, 50% were resistant to NLB, 48%
to SLB, and 32% to GLS.

Meeting adjourned at 11:55AM. Motion to adjourn by Natalia de Leon and seconded Jim Parks