

United States Department of Agriculture

Agricultural Research Service



Germplasm Enhancement of Maize

2018 GEM Cooperator Handout

December 5th 2018

The information in this report is shared cooperatively.
The data are not published, but are presented with the understanding that
they will not be used in publications without specific consent of the public cooperator.

GEM Mission:

The mission of the GEM (Germplasm Enhancement of Maize) Project is to effectively increase the diversity of U.S. maize germplasm utilized by producers, global end-users and consumers. The mission will be achieved through a collaborative effort between USDA-ARS, and both public and private research scientists by utilizing exotic, public, and proprietary maize germplasm. The resulting germplasm and associated knowledge, derived via the identification and incorporation of favorable alleles for prioritized traits from exotic sources, is utilized in private and public breeding programs and ultimately contributes to increased genetic diversity of maize grown by producers and improved product performance. In addition, the GEM Project provides opportunities for training plant scientists in the enhancement and utilization of unadapted germplasm. This contributes to the global sustainability of agricultural production, economic stability, and the nutrition and well-being of society.

GEM Cooperator Meeting Booklet

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GEM WEBSITE

<http://www.public.iastate.edu/~usda-gem/>



**Germplasm
Enhancement of
Maize**

Cooperator Meeting:

DATE: December 5, 2018
HOURL: 8:30 – 12:00 AM
LOCATION: Regency Ballroom D
Hyatt Regency Hotel, Chicago

Meeting called by: W. Trevisan, GEM Technical Steering Group Chair

Agenda Topics

Welcome, and Minutes of Dec 6, 2017; Elections Update	W. Trevisan, Chair & Moderator	8:30-8:35
Project updates: GEM releases, breeding cross evaluations, germplasm input request	D. Peters, M. Krakowsky	8:35-9:10
GEM Top 10 Project	Project Participants	9:10 – 9:30
Updates - GEM Project Participation	GEM Team	9:30 - 9:45
Appreciation for all Past Cooperators	GEM Team	9:45 – 10:00
Break		10:00 – 10:15
CIMMYT Activities and Tar Spot Update	T. Molnar	10:15 – 10:35
Mining Exotic Germplasm with Genomics and Breeding	J. Holland	10:35 – 11:10
A Pathway Based Method to Leverage GWAS Results	M. Warburton	11:10 – 11:45
Discussion	Coop Meeting Participants	11:45 - 12:00
Adjourn	W. Trevisan	12:00

Minutes of GEM Cooperators Meeting

12/6/2017

ASTA Convention, Hyatt Hotel, Chicago

Walter Trivisan gave welcome opening address. He read the mission statement of GEM to the audience. Next year, GEM will celebrate 25 years.

Idris Amusan will serve another 3 year term as TGS member. Another member of GEM's cooperator from Brazil is here with us.

Project Update

GEM Raleigh Project- Annual Report booklet was distributed to all attendees. Summary of presentation are highlight below:

2017 Yield Trial Results:

EXK7: second year GEM entries with 37 entries. GEMN-0272 was the highest performing non-commercial entry.

EXL4: Exotic inbred test. 3 new lines were identified-CML169, CML143, 90313.

EXM6: ex-PVP x ex-PVP trial: the goal is to identify good tester for exotic lines. PHMK0/LH211 was the highest yielding in the test, but PHMK0/LH213 was the best for yield, dry-down, and ear height.

EXM7: Allelic diversity study. Over 700 F1's with PHB47 or PHZ51 background evaluated.

EXM8: Exotic lines from South Africa and NCSU crossed to SSS and NSS pools. Results show no clear separation of exotic lines into the established US heterotic pools.

EXM9: GEMS x Dow (NSS). The goal is to find suitable tester for the GEM –Raleigh SS lines.

Nursery 2017 Results:

2000 nursery and 1000 isolation rows were use.

12 breeding crosses for S1 development generated.

37 GEM S1 advanced to S2.

11 new breeding crosses generated between accessions and GEM-Ames releases.

18 new GEM x GEM crosses

200 plus new breeding crosses.

2018 Work Plan:

GEM-Raleigh would manage 1000 – 3000 nursery rows for S1 to S2 inbreeding/selfing, breeding crosses, allelic diversity, GEM release increase, and breeding crosses observation.

Planning on 18 trials, comprising 15 trials for 1st-year GEM's, two second-year GEM selections, and one trial would be set up to identify potential future testers.

Matt expressed appreciations to all cooperators, and made request to cooperators for continual in-kind support.

2017 GEM Research Result (Ames) by David Peters

Nursery:

Total of 12,441 nursey rows grown at Ames with support from 6 US companies.

Breeding crosses containing 25% to 50% exotic g alleles were made in the shade house.

Allelic Diversity and DH update:

To date, 204 BGEM DH lines jointly released in 2014 with Iowa State University DH facility

22 set of DH line distributed to date.

30 BGEM lines selected based on performance in yield trial were provided to NCRPIS maize curator for the NPGS collection

147 BC1's from Raleigh were induced for haploid lines

2017 Pathology Trials:

9 different disease screening were done with help from cooperators. Genetic variability exists in GEM lines for different diseases.

Aflatoxin (USDA-ARS-CHPRRU, MS State)

ASR, GLS, NCLB (AgReliant Genetics)

Bacterial leaf Streak (Univ. of Nebraska, Lincoln, NE)

Goss's Wilt (Monsanto and Wyffels)

NLB and Fusarium (DuPont/Pioneer Hi-Bred)

NLB, SLB, and Fusarium (USDA-ARS-PSRU, Raleigh, NC)

CRW (USDA-ARS-PGRU, Columbia, MO)

NLB (Professional Seed Research)

2017 Yield Trial:

Ames had a total of 17,856 yield trial plots, with support from 13 cooperators in the US. This is an increase of 8.5% from 2016 plot number.

44 yield trial experiments done. The breakdown for the yield testing are 24 for 1st year trial, 11 for 2nd year trial, 7 for Released line trials (Advanced testing) and 2 for other evaluations.

GEM-Ames program thoughts and goals for the future:

Increase sampling of exotic germplasm through greater collaboration with GEM-Raleigh, increase use of shade house structure crossing at Ames, and in-kind support with cooperators.

Expand isolated crossing capacity

Would explore option to expand Goss's, fall army worm, and Bacterial Leaf Streak screening

Explore option to expand disease screening with international cooperators, especially on diseases not yet endemic to the US

2018 GEM-Ames Releases

6 new Stiff Stalk and 2 new Non Stiff Stalk were release.

Dave thanked all cooperators for their support.

Top GEM Project: Goran Srnic (DowDupont).

Goran gave an overview and results of the Top GEM project. The overview included background, testing network, disease and molecular characterizations of the GEM materials.

Molecular characterization showed there is more diversity within the NSS than SS pool.

He proposed we continue this collaborative effort next year, and every 5 years.

This will enable our understanding of the GCA and SCA affinity of GEM releases. It will also aid assimilation rate of GEM germplasm within by various breeding companies and strengthening cooperation.

Proposal was widely supported. Others suggested we should incorporate marker strategy within GEM, for predicting individual traits for possible gene candidates.

Top 48 GEM disease screening: Idris Amusan (AgReliant Genetics)

Idris gave results of GLS, NCBL and ASR screening for GEM Top 48. Several GEM lines have resistance to multiple diseases. Significant number of GEM releases show better resistance to GLS, NCBL, and ASR compare to industry standard.

Bag Tag Survey: W Tracy (University of Wisc.)

Tracy gave the 5 mission statements/recommendation of the USDA:

Farmer's survey found high usage of relabel seeds. They are discrepancy in relative maturity of re-label seed by multiple brands. Differences of \$97 in relabel seed bag of same varieties. He attributed this to production cost and quality service. Same genetics in different relabel bags jeopardize genetic diversity of seed planted on their farm.

Panel discussion on Maize Genetic Diversity & Commercial Breeding Programs:

G. Graham (DowDupont), JD Rossouw (Monsanto) D. Dyer (Syngenta)-

Dyer - There is no intention to deceive growers on sales of relabeled seed bag. Pedigree information is printed on the seed bag. However, there is a great genetic diversity of hybrid grown in the US. There are many elite breeding pools in the US hybrid. With consolidation, that should not decrease genetic diversity of the US corn-belt germplasm. US SS pool is used heavily around the world. We are using a lot of European germplasm in the US Corn-Belt. So, there is more mixing of germplasm pool. Now with gene

editing, a lot of genetic diversity would be created. Genomics selection is contributing to commercial corn in the US. Syngenta uses GS to increase diversity in the pool. Policy and regulations limit use of genetic diversity from other part of the world.

Graham – Technology is not strategy. Strategy is what you do. Technology helps how you do it better. There is more diversity in the two heterotic groups today, compare to the 70s.

JD Rossouw – Diversity over many decades has helped in adaptations to biotic and abiotic stress to increase yield. Breeding groups would need to find ways to use technology to help identify more genetic diversity. Happy to see that the GEMs efforts is making good progress in contributing to useful genetic diversity.

How do you see GMO and traits contributing to Genetic diversity?

Dyer - We should think of genetic variability as genetic diversity. Native trait is going to be part of the solution. This is the same concept as seed treatment on your allelic diversity to insect tolerance.

How will gene editing technology affect native diversity?

Response: Genome editing is a big class of technology. The challenge is to know what to edit. We know some very well, like herbicides binding site and we can manipulate that very well. Gene editing for abiotic stress is much difficult, and known basis is sparse.

Question: Consolidation in the industry?

Response 1- Consolidation brings the best in our commercial line up. How to use technology to enhance our breeding strategy is what we will need to do better.

Response 2- Echo same comment. Germplasm integration helps product development with consolidation.

Response 3 - same sentiments

Question- How can we set up our breeding efforts to increase diversity over time?

SYN – We have the technical tools to measure diversity which we don't have before. Our job is to identify functional diversity that ensures product performance.

MON – We may need to structure our breeding around strategy that will increase functional diversity for the long time. 16% of deployments contain recycling line of exotic line.

DD – Exotic introgression into US material is good to ensure future genetic diversity.

Question – How do you select for product that withstands diverse environmental effect?

Response – Year effect is a great significant in product development. We have a long fall this year, in Nebraska, ear drops due to long fall reduce yield. Farmers need to plant diverse corn product as insurance against this short fall.

Question- What would you advise public sector to focus on genetic diversity?

Response 1- We are going to be more design driven now, than in the past. With the data and resources that we have, we now understand that we cannot translate haplotype to phenotype. We now know that it is

haplotype x environmental interaction that dictate phenotype performance. We need to maintain and exploit native traits variation. What is the underline genome structure that we have? It is integration of scientists coming together to unravel what the gene is doing to ensure our product performance.

Response 2 - Efforts of phenomics will help a lot in understanding the native variation we have and where they fit in.

Response 3 - GEM is a good example of public-private sector partnership. We need to leverage cooperation, and what we know, to enhance our knowledge of useful gene diversity.

Question: How do we improve the genetic diversity in the SS pool?

Response – Introgression and recycling of germplasm across continent will be a good direction.

Update on Genome to Field: Shawn Kaeppler

The focus of G2F is to leverage the National Plant Genome Initiative investment in genome data with new phenotyping tools, to deliver new products to farmers. This started in 2014. They are a few publications from this project.

G2F dissects stability of hybrids using ex-PVP, finds out how stable is the new recycle products from the ex- PVP, likely impact of exotic introgression on GxE, using the GEM x ex-PVP lines. G2F tries to characterize exotic materials in diverse genetic contexts

Presently, G2F works on North America Germplasm- Based Genetics Modelling and allele characterization. The goal is to identify novel genes and ideotypes through modelling and physiological characterization.

G2F is developing integrating data structure, standardized measurement protocols, and genetic resources.

Question- How do you see G2F interacting with GEM? Walter,

Response- Interacting and cooperation on germplasm is a good leverage. Databases and standardization will be of mutual benefit. This should contribute to how understanding of genetic diversity.

Question- GEM's mission is to diversify the germplasm pool of US Corn-Belt. How do you leverage this mission with G2F mission?

Response – We use GEM materials because we are interested in them since the start of G2F. Conversation will make us more efficient in resource utilization and create synergies.

Question – How can you expand the participation of more private companies?

Response- G2F seeks for private sector cooperation at all times.

Question – Mission statement of G2F is pretty big and ambitious, how will some of the work in G2F impact farmers?

Response – commercialization will happen through the private sector. Training of student, understanding of gene functions and facilitating technology will filter out to farmer's benefits, through private sector utilization of the results from G2F hypotheses testing.

Exploring the Genotype- Phenotype Landscape for Germplasm: Jianming Yu (Iowa State University)

This course being taught at ISU addresses significant questions in plant breeding through quantitative genetics, complex trait dissection, breeding strategy and design, gene and genetics, genomes and chromosomes, research and training.

Meeting adjourns at 11:45 AM.

Allelic Diversity

GEM Allelic Diversity Project

Table 1: Total races by country

Country	Races [%]	% of Total Races [*]	Races with Acc. ^{&}	Accessions	% of Total Acc. ^{\$}
ARGENTINA	33	8.9	27	28	7.2
BOLIVIA	39	10.5	29	32	8.2
BRAZIL	34	9.2	34	34	8.7
CHILE	17	4.6	17	17	4.4
COLOMBIA	23	6.2	23	34	8.7
COSTA RICA	3	0.8	3	3	0.8
ECUADOR	34	9.2	34	38	9.8
EL SALVADOR	1	0.3	1	1	0.3
GUATEMALA	20	5.4	19	22	5.7
MEXICO	55	14.8	53	56	14.4
PANAMA	1	0.3	1	1	0.3
PARAGUAY	7	1.9	7	7	1.8
PERU	52	14.0	51	56	14.4
UNITED STATES [#]	17	4.6	17	17	4.4
URUGUAY	4	1.1	4	4	1.0
VENEZUELA	19	5.1	19	21	5.4
WEST INDIES	12	3.2	12	18	4.6
Grand Total	371	100	351	389	100

[%] Unique races for each country; some races are represented in more than one country

^{*} Includes only races that are listed on spreadsheet, not all races of maize

[&] Races to which accessions have been assigned on spreadsheet; Some accessions may not be readily available from NPGS or other collections...

^{\$} Includes only accessions that are listed on spreadsheet, not all accessions of maize

[#] All of the "races" are Native American varieties that have been studied only lightly

GEM Allelic Diversity Project

Table 2: AD Completed as of October 2017

	F ₁ with PHB47	BC ₁ with PHB47	BC ₁ F ₂ [#]	BC ₁ F ₃	BC ₁ F ₄	BC ₁ F ₅	BC ₁ F ₆	DH	F ₁ with PHZ51	BC ₁ with PHZ51	BC ₁ F ₂	BC ₁ F ₃	BC ₁ F ₄	BC ₁ F ₅	BC ₁ F ₆	DH
ARGENTINA	27 races (28 acc.)	27 races (28 acc.)	5	1					27 races (27 acc.)	27 races (27 acc.)	10					
BOLIVIA	30 races (32 acc.)	30 races (32 acc.)	1	5	5	2			30 races (33 acc.)	30 races (33 acc.)	7	6	6	1		
BRAZIL	34 races (34 acc.)	34 races (34 acc.)	10						34 races (34 acc.)	34 races (34 acc.)	10	2				
CHILE	17 races (18 acc.)	16 races (17 acc.)		1					17 races (17 acc.)	16 races (16 acc.)	1					
COLOMBIA	23 races (34 acc.)	23 races (34 acc.)	3	8	1				22 races (32 acc.)	22 races (32 acc.)	3	9		1		
COSTA RICA	3 races (3 acc.)	2 races (2 acc.)							3 races (3 acc.)	2 races (2 acc.)						
ECUADOR	33 races (37 acc.)	33 races (37 acc.)	9	6	1				33 races (37 acc.)	33 races (37 acc.)	10	7		1		
EL SALVADOR	1 races (1 acc.)	1 races (1 acc.)							1 races (1 acc.)	1 races (1 acc.)						
GUATEMALA	20 races (22 acc.)	20 races (22 acc.)	7	2				2	20 races (21 acc.)	20 races (21 acc.)	8	4				
MEXICO	51 races (55 acc.)	50 races (54 acc.)	9	7				1	50 races (54 acc.)	50 races (54 acc.)	12	8				
PANAMA	1 races (1 acc.)	1 races (1 acc.)							1 races (1 acc.)	1 races (1 acc.)						
PARAGUAY	7 races (7 acc.)	7 races (7 acc.)	3						7 races (7 acc.)	7 races (7 acc.)	4					
PERU	51 races (55 acc.)	51 races (55 acc.)	12	8	4				51 races (54 acc.)	50 races (53 acc.)	12	9	4			
UNITED STATES	17 races (17 acc.)	17 races (17 acc.)							17 races (17 acc.)	16 races (16 acc.)						
URUGUAY	4 races (4 acc.)	4 races (4 acc.)							4 races (4 acc.)	4 races (4 acc.)						
VENEZUELA	19 races (20 acc.)	19 races (20 acc.)	7	1					19 races (21 acc.)	19 races (21 acc.)	12	2				
WEST INDIES	12 races (18 acc.)	12 races (18 acc.)		1					12 races (16 acc.)	12 races (16 acc.)		1				
2017 TOTAL	350 races (386 acc.)	348 races (382 acc.)							348 races (380 acc.)	345 races (373 acc.)						
<i>2016 TOTAL</i>	<i>348 races (382 acc.)</i>	<i>346 races (380 acc.)</i>							<i>343 races (374 acc.)</i>	<i>342 races (357 acc.)</i>						
<i>2015 TOTAL</i>	<i>344 races (377 acc.)</i>	<i>341 races (374 acc.)</i>							<i>321 races (349 acc.)</i>	<i>288 races (311 acc.)</i>						

Table 3. DH1 Lines Advanced to DH2

Entry	Pedigree	Lines
1	(Amargo-ARZM 03 014/PHZ51)/PHZ51	14
2	(Amarillo salvadoreño-CIMMYT Comp./PHZ51)/PHZ51	10
3	(Araguito-VEN 568/PHZ51)/PHZ51	8
4	(Camelia-CHZM 04 011/PHZ51)/PHZ51	21
5	(Canario de formosa-ARZM 06 016/PHZ51)/PHZ51	6
6	(Conejo-GRO_157/PHZ51)/PHZ51	12
7	(Cuban_Flint-CUB_63/PHZ51)/PHZ51	15
8	(Nal-tel BTB-GUA 145/PHZ51)/PHZ51	8
9	(Nal-tel_ATB-GUA_111/PHZ51)/PHZ51	26
10	(Nal-Tel-CAM 48/PHZ51)/PHZ51	31
11	(PHB47/(PHB47/Cuzco Ecuatoriano-ECU 530)	1
12	(PHB47/(PHB47/Paru-BOV)	1
13	(PHB47/Sabanero Ecuatoriano-ECU 433)/PHB47	6
14	(PHZ51/(PHZ51/Cuzco Ecuatoriano-ECU 530)	1
15	(PHZ51/(PHZ51/Nal-tel de ocho-GUA 458)	12
16	(PHZ51/(PHZ51/Pira-CUN 327)	11
17	(PHZ51/(PHZ51/Quicheno late-GUA 863)	2
18	(PHZ51/(PHZ51/Zamorano Amarillo-MIC 66)	8
19	(PHZ51/Aleman-HCO 38)/PHZ51	14
20	(PHZ51/Amarillo de Malleco-CHZM 09 002)/PHZ51	11
21	(PHZ51/Arrocillo_Amarillo-VER_311)/PHZ51	8
22	(PHZ51/Avati moroti-PAG 136)/PHZ51	6
23	(PHZ51/Avati Tupi-PAG 129)/PHZ51	4
24	(PHZ51/Brazil-1694 (USDA))/PHZ51	17
25	(PHZ51/Cateto-BAI I)/PHZ51	13
26	(PHZ51/Coastal Tropical Flint-BVIR 104)/PHZ51	9
27	(PHZ51/Coscomatepec-VER 110)/PHZ51	13
28	(PHZ51/Cristal_de_Chihuahua-CHH_128)/PHZ51	17
29	(PHZ51/Cubano Amarillo-BVIR 102)/PHZ51	9
30	(PHZ51/Dulce-ARZM 20 005)/PHZ51	26
31	(PHZ51/Sabanero-VEN_514)/PHZ51	2
32	(PHZ51/Tuson-BAI III)/PHZ51	18
33	(PHZ51/Tuson-CUB 67)/PHZ51	9
34	(PHZ51/Tuxpeño-BVIR_153)/PHZ51	11
35	(PHZ51/Zapalote Chico-OAX 50)/PHZ51	6
36	(Tuxpeño-ECU 942/PHZ51)/PHZ51	12

Breeding Cross Observation

Table 4. 2018 Raleigh Breeding Cross Observations

	Pedigree	Silk	Silk	Anthesis	Anthesis	Ear height	Plant height	Disease rating #1	Disease rating #2	Aspect [#]	Notes
		days	GDU	days	GDU	cm	cm	1-9, 1 = best	1-9, 1 = best	1-5, 1 = best	
1	Celaya-GTO28:S(LH204)	72	1596	69	1493	154	321	2.3	3.3	C	
2	Celaya-GTO28:S(PHP38)	74	1628	70	1516	143	301	1.8	2.8	C	
3	Celaya-GTO29:S(LH204)	68	1471	67	1426	150	324	2.5	3.5	C	
4	Celaya-GTO29:S(PHP38)	69	1486	66	1419	131	304	3.3	4.8	C	Some SL
5	Celaya-GTO36:(DK 2FACC)	67	1441	67	1426	134	290	2.0	4.3	C	Some RL
6	Celaya-GTO36:(DK FBLL)	66	1404	65	1389	136	318	3.8	4.5	C	
7	Celaya-GTO36:S(PHP38)	70	1520	69	1505	133	291	2.3	3.8	4/C	Some RL
8	Celaya-GTO36:S(PHK29)	72	1579	69	1501	136	301	3.5	3.8	C	RL a problem
9	Celaya-GTO36:S(PHW51)	70	1531	67	1426	153	310	2.8	4.5	C	Some lodging
10	Celaya-GTO36:S(PHW52)	68	1471	67	1449	140	291	2.8	4.0	C	Some lodging
11	Celaya-GTO36:S(PHW86)	68	1471	66	1404	153	294	3.0	3.3	C	
12	Celaya-GTO69:S(LH204)	71	1553	69	1486	143	318	2.0	2.8	C	
13	Celaya-GTO69:S(PHP38)	72	1572	69	1493	136	298	1.5	2.3	C	
14	Celaya-GTO84:(DK 2FACC)	71	1566	70	1515	139	329	3.3	4.8	C	Poor husk cover
15	Celaya-GTO84:S(LH204)	73	1610	69	1508	156	326	2.8	3.5	C	Poor husk cover
16	Celaya-GTO84:S(PHK29)	74	1629	71	1546	156	303	2.0	3.0	C	
17	Celaya-GTO84:S(PHP38)	72	1579	69	1493	161	324	1.8	2.3	C	
18	Celaya-GTO84:S(PHW51)	76	1707	69	1508	141	330	3.5	4.0	C	
19	Celaya-GTO84:S(PHW52)	71	1560	69	1508	146	316	3.5	4.5	C	
20	Celaya-GTO84:S(PHW86)	71	1546	68	1456	153	310	3.0	4.3	C	
21	Celaya-JAL167B:S(LH204)	68	1463	66	1419	151	324	2.3	3.8	C (A)	
22	Celaya-JAL167B:S(PHP38)	69	1493	67	1448	156	311	1.8	1.8	4/C	Variable ear height; room for selection?
23	Puya-SAN349:S(LH204)	70	1523	68	1478	149	316	1.3	1.8	C	Stalk rot susceptible
24	Puya-SAN349:S(PHP38)	68	1463	68	1456	148	311	1.0	1.5	C	
25	Tuxpeno-CHS462:S(LH204)	73	1616	71	1551	173	331	2.0	3.0	C (A)	
26	PHP38/Tuxpeno-CHS462:S(PHP38)	75	1671	71	1567	163	316	1.3	1.8	C (A)	
27	Tuxpeno-SLP146:S(PHP38)	73	1624	71	1553	155	319	1.0	1.3	C (A)	Poor husk cover
28	Popn21(IST)C2:S(LH204)	68	1463	67	1449	150	325	1.0	1.8	C (A)	
29	Popn21(IST)C2:S(PHP38)	70	1523	69	1508	153	318	1.0	1.0	4/C	Ear height only issue
30	Popn24(IST)C2:S(LH204)	68	1456	67	1448	143	314	1.0	1.3	C	
31	Popn24(IST)C2:S(PHP38)	68	1463	67	1434	139	295	1.0	1.0	3	
32	HB83(M):S(PHP38)	70	1531	69	1485	140	304	1.3	1.5	4/C	
33	HB83(M):S(LH193)	73	1609	70	1538	144	310	1.0	1.5	C	
34	HB83(M):S(LH204)	71	1545	69	1493	151	306	1.0	1.0	4/C	
35	ICA V-156:S(LH204)	69	1508	68	1463	144	304	1.0	1.3	4/C	
36	ICA V-156:S(PHP38)	70	1538	69	1493	143	303	1.0	1.0	3	Variable ear height; room for selection?
37	INIA 160:S(PHMKO)	65	1381	65	1374	129	304	2.8	4.8	5	
38	INIA 160:S(PHP38)	66	1411	65	1389	123	284	3.3	4.8	4	
39	MonsantoT1:S(GEMS-0226)	76	1692	75	1677	146	310	1.5	3.0	4/C	Monsanto T1 is a tropical hybrid
40	MonsantoT1:S(GEMS-0227)	69	1508	70	1538	138	309	2.0	2.8	2	Monsanto T1 is a tropical hybrid
41	MonsantoT2:S(GEMS-0226)	72	1590	72	1588	138	286	1.0	1.0	4	Monsanto T2 is a tropical hybrid
42	MonsantoT2:S(GEMS-0227)	67	1449	67	1441	128	295	1.3	1.5	2.5	Monsanto T2 is a tropical hybrid
43	55T1:S(LH204)	67	1449	67	1433	126	278	2.0	2.3	3	55T1 is a tropical hybrid from company 55
44	55T1:S(PHK29)	68	1456	67	1441	125	266	1.5	2.3	3	55T1 is a tropical hybrid from company 55
45	55T1:S(PHP38)	69	1486	68	1471	125	284	1.8	2.0	3	55T1 is a tropical hybrid from company 55

Table 4. 2018 Raleigh Breeding Cross Observations

	Pedigree	Silk	Silk	Anthesis	Anthesis	Ear height	Plant height	Disease rating #1	Disease rating #2	Aspect [#]	Notes
		days	GDU	days	GDU	cm	cm	1-9, 1 = best	1-9, 1 = best	1-5, 1 = best	
46	55T1:S(PHW51)	68	1471	67	1441	121	289	2.5	2.3	4	55T1 is a tropical hybrid from company 55
47	55T1:S(PHW52)	66	1404	66	1396	126	279	2.0	1.8	4	55T1 is a tropical hybrid from company 55
48	55T1:S(PHW86)	63	1332	63	1320	123	279	1.5	2.5	4	55T1 is a tropical hybrid from company 55
49	55T2:S(DK 2FACC)	67	1426	66	1419	118	264	3.8	5.8	4	55T2 is a tropical hybrid from company 55
50	55T2:S(DK FBLL)	68	1463	67	1434	128	276	4.3	6.8	4	55T2 is a tropical hybrid from company 55
51	55T2:S(PHK29)	70	1520	69	1508	119	259	1.8	2.0	3	55T2 is a tropical hybrid from company 55
52	55T2:S(PHP38)	68	1471	68	1463	123	268	2.3	2.5	2.5	55T2 is a tropical hybrid from company 55
53	55T2:S(PHW51)	68	1463	67	1426	121	276	1.5	1.8	4	55T2 is a tropical hybrid from company 55
54	55T2:S(PHW52)	66	1418	66	1418	121	276	2.0	2.8	3.5	55T2 is a tropical hybrid from company 55
55	55T2:S(PHW86)	65	1374	64	1354	124	254	1.8	2.3	5	55T2 is a tropical hybrid from company 55
56	55T3:S(DK FBLL)	66	1419	66	1411	118	269	3.3	5.0	4.5	55T3 is a tropical hybrid from company 55
57	55T3:S(PHK29)	68	1456	68	1456	116	268	1.8	2.8	3	55T3 is a tropical hybrid from company 55
58	55T3:S(PHP38)	69	1493	69	1493	125	270	1.0	1.8	2.5	55T3 is a tropical hybrid from company 55
59	T4:S(LH204)	77	1711	75	1672	174	341	1.3	1.3	C	T4 is an old inbred from Tuxpeno
60	T4:S(PHP38)	77	1711	75	1664	148	320	1.8	1.5	C (A)	T4 is an old inbred from Tuxpeno
61	T5:S(PHP38)	74	1650	72	1595	150	316	2.0	2.3	C (A)	T5 is an old inbred from Tuxpeno
62	T6:S(LH204)	72	1596	70	1530	166	329	1.0	1.3	C	T6 is an old inbred from Tuxpeno
63	T6:S(PHP38)	72	1590	70	1538	149	310	1.0	1.3	C (A)	T6 is an old inbred from Tuxpeno
64	BR106:T33aS(LH193)	71	1546	70	1523	124	290	1.8	2.8	4	
65	BR106:T33aS(LH204)	70	1515	68	1463	159	316	1.0	1.3	4/C	
66	BR106:T33aS(PHP38)	69	1493	68	1478	136	300	1.0	1.3	4/C	
67	BR106:T33bS(LH193)	69	1500	70	1515	121	286	2.5	4.3	4	
68	BR106:T33bS(LH204)	70	1515	70	1515	140	296	1.0	1.8	4/C	
69	BR106:T33bS(PHP38)	71	1558	70	1530	145	300	1.0	1.5	4/C	
70	BR106:T33cS(LH204)	71	1553	70	1530	145	294	1.0	1.0	4/C	
71	BR106:T33cS(PHP38)	71	1545	71	1545	135	293	1.3	1.3	4/C	
72	BR106:T33dS(LH193)	68	1478	68	1463	114	284	2.5	3.8	5	
73	BR106:T33dS(LH204)	67	1449	67	1434	139	295	1.5	1.8	4/C	
74	BR106:T33dS(PHP38)	67	1441	67	1441	134	299	1.0	1.3	4/C	
75	(89291/CML373):S(PHEW7)	66	1404	65	1381	126	308	1.8	2.3	3.5	
76	(KO679Y/CML287):S(PHW52)	69	1485	69	1493	121	288	2.5	2.8	3.5	
77	(CML287.CML373):S(LH193)	69	1485	68	1471	133	291	3.0	4.0	5	
78	(CML287.CML373):S(LH200)	71	1544	70	1516	138	296	1.3	1.8	4/C	
79	(CML287.CML373):S(PHHB9)	69	1506	69	1501	136	314	1.0	1.5	4/C	Poor husk cover
80	(CML287.CML373):S(PHP38)	68	1471	68	1463	139	295	1.0	1.5	C	
81	(CML339.CML423):S(LH195)	69	1500	69	1493	131	285	1.8	2.5	4	
82	(CML423.CML340):S(LH195)	72	1581	70	1530	129	295	1.5	2.0	3.5	
83	(CML423/CML343):S(PHEW7)	66	1396	65	1381	123	290	1.3	2.0	3.5	
84	(CML423/CML343):S(PHW52)	67	1434	66	1404	114	286	1.8	2.0	3.5	
85	(KO679Y/La Posta Seq C7 F64-2):S(DK 2FACC)	66	1404	66	1411	116	271	2.8	4.5	4	
86	(KO679Y/La Posta Seq C7 F64-2):S(DK FBLL)	68	1478	67	1449	114	276	4.0	5.0	4	
87	(KO679Y/La Posta Seq C7 F64-2):S(PHP38)	67	1448	67	1441	126	283	1.5	2.0	3	
88	(KO679Y/La Posta Seq C7 F64-2):S(PHW51)	66	1411	65	1389	129	296	1.0	1.3	4	
89	(KO679Y/La Posta Seq C7 F64-2):S(PHW52)	66	1404	66	1404	110	276	2.8	3.5	5	
90	(KO679Y/La Posta Seq C7 F64-2):S(PHW86)	65	1389	65	1381	121	255	2.0	2.5	3	

Table 4. 2018 Raleigh Breeding Cross Observations

	Pedigree	Silk	Silk	Anthesis	Anthesis	Ear height	Plant height	Disease rating #1	Disease rating #2	Aspect [#]	Notes
		days	GDU	days	GDU	cm	cm	1-9, 1 = best	1-9, 1 = best	1-5, 1 = best	
91	St Croix GP3:N14	73	1607	72	1595	130	291	1.5	2.5	4/C	
92	St Croix GP3:N20	72	1586	70	1515	126	308	1.0	2.0	4	
93	St. Croix Group 3:N(LH82)	66	1396	65	1381	130	286	2.8	4.8	5	
94	St. Croix Group 3:N(GEMN-0048)	72	1592	70	1523	159	338	1.5	1.8	C (A)	
95	Cubano Amarillo Duro-ECU 904:N(LH82)	68	1464	67	1426	136	294	3.0	4.5	5	
96	Cubano Amarillo Duro-ECU 904:N(GEMN-0048)	74	1639	72	1583	154	329	1.3	2.5	C (A)	
97	Perla-LIM 13:N(LH82)	67	1433	66	1411	129	290	2.8	3.5	5	
98	Perla-LIM 13:N(GEMN-0048)	72	1595	71	1545	155	334	1.0	1.5	C (A)	
99	Cubano Amarillo Duro-UCA 12:N(LH82)	67	1426	66	1411	143	299	1.5	2.8	5	
100	Cubano Amarillo Duro-UCA 12:N(GEMN-0048)	74	1629	71	1553	159	331	1.0	1.3	4/C	
101	Amarillo precoz-Valle 343:N(LH82)	66	1404	65	1389	124	279	2.3	3.3	5	
102	Amarillo precoz-Valle 343:N(GEMN-0048)	70	1528	69	1493	148	321	1.0	1.3	4/C	
103	Canilla-VEN 981:N(LH82)	70	1515	67	1441	126	264	1.5	2.0	4/C	
104	Canilla-VEN 981:N(GEMN-0048)	75	1677	73	1623	144	298	1.3	1.3	C	
105	Criollo-GUA Group 21-18A:N(LH82)	68	1471	67	1433	116	253	2.5	3.8	5	
106	Criollo-GUA Group 21-18A:N(GEMN-0048)	72	1595	71	1553	153	315	1.0	1.8	C (A)	
107	Cuban Yellow Flint-CHS429:N(LH82)	66	1411	66	1396	136	300	2.0	3.8	C	
108	Cuban Yellow Flint-CHS429:N(GEMN-0048)	74	1630	72	1583	151	314	1.3	2.3	C (A)	
109	Coastal Tropical Flint-Barbados GP2:N(LH82)	71	1553	69	1486	139	291	2.3	3.3	C	
110	Coastal Tropical Flint-Barbados GP2:N(GEMN-0048)	77	1711	74	1637	174	344	1.5	2.3	C	
111	BOZM 1168:N(LH82)	67	1441	67	1433	146	300	2.5	3.3	C	
112	BOZM 1168:N(GEMN-0048)	72	1598	70	1538	159	324	1.5	1.8	C (A)	
113	PM-801:N(LH82)	67	1441	66	1396	145	293	2.0	3.0	5	
114	PM-801:N(GEMN-0048)	74	1627	71	1553	154	324	1.5	2.0	C (A)	
115	ICA V-106:N(LH82)	66	1396	65	1381	138	284	2.8	3.3	5	
116	ICA V-106:N(GEMN-0048)	71	1553	70	1515	143	299	1.5	2.3	4/C	
117	Pioneer X105A:N(LH82)	65	1389	65	1381	120	284	2.3	3.8	5	
118	Pioneer X105A:N(GEMN-0048)	71	1561	70	1523	135	309	1.5	1.8	C (A)	
119	ICA H-154:N(GEMN-0048)	72	1575	70	1530	153	314	1.3	1.3	C (A)	
120	HB 83:N(LH82)	68	1471	67	1426	129	278	2.3	2.5	3.5	
121	HB83:N(GEMN-0048)	74	1637	72	1590	140	319	1.0	1.3	4/C	
122	FL 4BT7:N(GEMN-0048)	70	1523	70	1523	133	309	1.0	1.0	3.5	FL 4BT7 from FS8B(T) Cycle 4
123	FL 4BT7:N(LH216)	69	1485	67	1449	118	269	1.3	1.3	2.5	FL 4BT7 from FS8B(T) Cycle 4
124	FL 4BT7:N(PHK56)	68	1456	66	1419	131	290	1.5	1.5	3	FL 4BT7 from FS8B(T) Cycle 4
125	Population 32 (IST) C2:N(LH185)	67	1441	67	1434	129	293	1.0	1.5	3.5	
126	Population 32 (IST) C2:N(LH213)	68	1463	67	1449	129	295	1.3	2.3	3	
127	((NC258/NC296)/NC300):N(DK HBA1)	68	1471	68	1456	113	266	1.0	1.0	3	
128	((NC258/NC296)/NC300):N(LH213)	68	1478	68	1456	119	246	1.5	2.5	4	
129	((NC258/NC296)/NC300):N(LH216)	69	1493	68	1456	116	256	1.5	2.3	4	
130	((NC258/NC296)/NC300):N(PHK56)	67	1449	66	1419	111	258	2.5	4.5	5	Too early for Raleigh
131	(Pool17HS208+Pool33-128):N(LH213)	67	1426	66	1404	116	288	1.0	1.3	2.5	
132	Population 33 (IST) C2:N(LH213)	66	1404	65	1389	126	289	1.5	3.3	3	
133	Tropical Hybrid 19x03:N40	69	1493	68	1456	121	283	1.3	1.8	4	
134	Tropical Hybrid 19x03:N(LH82)	67	1441	66	1403	121	285	2.0	2.5	4	
135	Tropical Hybrid 19x03:N(LH185)	69	1508	68	1471	133	319	1.0	1.0	4/C	

Table 4. 2018 Raleigh Breeding Cross Observations

	Pedigree	Silk	Silk	Anthesis	Anthesis	Ear height	Plant height	Disease rating #1	Disease rating #2	Aspect [#]	Notes
		days	GDU	days	GDU	cm	cm	1-9, 1 = best	1-9, 1 = best	1-5, 1 = best	
136	Tropical Hybrid 19x03:N(LH212Ht)	69	1493	68	1471	145	318	1.0	1.3	C	
137	Tropical Hybrid 19x03:N(LH213)	70	1523	69	1485	148	310	1.0	1.8	C (A)	
138	Tropical Hybrid 19x03:N(LH216)	72	1583	69	1508	154	318	1.5	1.3	C	
139	Tropical Hybrid 19x03:N(PHK56)	69	1500	68	1456	129	310	2.3	2.3	3.5	
140	55T1:N(DK_3IHH6)	66	1419	66	1404	123	315	2.8	3.3	5	
141	55T1:N(LH185)	67	1449	66	1419	119	288	1.0	1.0	3	
142	55T1:N(LH82)	65	1389	65	1374	118	266	2.0	3.0	5	
143	DK_MBWZ/55T1	67	1449	67	1449	128	276	1.3	1.3	3	MBWZ combines better with NSS?
144	BG070404:D27-018:S(LH193)	66	1419	66	1419	114	270	5.3	7.0	5	
145	BG070404:D27-018:S(PHP38)	67	1426	66	1411	128	296	2.0	3.0	4	
146	BG070404:D27-043:S(LH193)	67	1449	68	1463	123	289	5.3	7.0	5	
147	BG070404:D27-043:S(PHP38)	67	1441	67	1434	135	295	2.3	4.0	5	
148	DK_XL212:S(LH193)	68	1456	66	1419	118	270	3.5	5.0	5	
149	DK_XL212:S(PHP38)	68	1463	66	1411	135	284	1.0	1.8	4	
150	(NC320/CML16)-2-SIB#2-1-1:S(LH193)	68	1478	68	1471	131	294	1.3	3.3	5	
151	(NC320/CML16)-2-SIB#2-1-1:S(PHP38)	68	1478	68	1463	136	284	1.0	1.0	4	
152	(NC320/CML341)-3-SIB#2-1-1:S(LH193)	68	1478	68	1478	128	291	3.3	4.8	5	
153	(NC320/CML341)-3-SIB#2-1-1:S(PHP38)	67	1441	67	1449	130	286	1.0	1.0	4	
154	GEMS-0227/GEMS-0245	65	1389	65	1389	113	293	2.8	4.0	4	
155	GEMS-0243/GEMS-0245	69	1486	69	1486	128	293	2.8	3.8	5	
156	GEMS-0245/GEMS-0253	68	1478	68	1478	120	274	1.5	2.3	3	Smallish ears
157	GEMS-0245/GEMS-0255	69	1485	68	1478	133	299	1.0	1.0	4	
158	GEMS-0245/GEMS-0273	67	1449	66	1419	120	274	3.5	4.8	5	
159	GEMS-0245/GEMS-0274	68	1463	67	1441	111	285	2.5	4.0	4	
160	GEMS-0293/GEMS-0113	67	1441	67	1449	121	281	3.0	4.5	3.5	
161	GEMS-0255/GEMS-0293	69	1485	69	1500	126	288	1.3	1.5	2.5	
162	GEMS-0293/GEMS-0281	67	1426	67	1441	113	260	1.8	3.5	2	
163	GEMS-0281/GEMS-0294	66	1411	67	1426	114	283	2.5	5.5	5	
164	GEMS-0294/GEMS-0255	68	1463	69	1486	128	290	1.0	1.3	4	
165	GEMS-0255/GEMS-0295	69	1493	69	1485	125	294	1.0	1.0	4	
166	GEMS-0295/GEMS-0281	66	1411	66	1419	119	273	3.3	4.5	3.5	
167	BR106:G39-012-002/GEMS-0113	66	1419	67	1434	129	290	2.3	4.0	5	
168	BR106:G39-012-002/GEMS-0220	67	1433	67	1433	121	285	1.5	3.3	4	
169	BR106:G39-012-002/GEMS-0237	68	1471	68	1463	129	290	2.3	3.8	5	Stalk rot susceptible
170	GEMS-0255/BR106:G39-012-002	68	1463	68	1471	124	288	1.0	1.0	4	
171	BR106:G39-012-002/GEMS-0281	66	1411	67	1426	125	279	1.8	3.0	4	Stalk rot susceptible
172	GEMS-0113/CML343:S42-001-010	69	1493	68	1471	119	294	3.0	3.5	4	
173	CML343:S42-001-010/GEMS-0255	71	1553	70	1530	123	276	1.0	1.0	3.5	
174	GEMN-0292/GEMN-0104	68	1463	67	1449	130	284	1.0	1.0	4	
175	GEMN-0292/GEMN-0135	68	1478	66	1411	114	261	1.0	1.5	5	Parents too related?
176	GEMN-0292/GEMN-0272	65	1390	65	1367	105	283	1.3	1.5	3.5	
177	GEMN-0287/GEMN-0292	66	1396	65	1381	116	288	1.0	1.0	3.5	
178	GEMN-0124/GEMN-0270	66	1404	65	1389	121	281	1.0	1.3	3	
179	GEMN-0124/GEMN-0287	68	1463	67	1448	118	285	1.0	1.3	2.5	
180	CML78:S(LH193)	65	1381	65	1381	111	281	5.0	5.3	5	

Table 4. 2018 Raleigh Breeding Cross Observations

	Pedigree	Silk	Silk	Anthesis	Anthesis	Ear height	Plant height	Disease rating #1	Disease rating #2	Aspect [#]	Notes
		days	GDU	days	GDU	cm	cm	1-9, 1 = best	1-9, 1 = best	1-5, 1 = best	
181	CML78:S(LH200)	66	1404	66	1404	108	295	3.5	5.0	3	
182	CML78:S(LH204)	65	1389	65	1389	123	285	3.5	4.3	4	
183	CML78:S(PHHB9)	66	1404	66	1404	128	293	2.8	3.8	3	
184	CML78:S(PHMK0)	65	1389	65	1383	129	308	3.3	4.0	4/C	
185	CML78:S(PHP38)	64	1360	64	1360	113	271	2.5	3.5	3.5	
186	CML78:S(PHW52)	65	1381	65	1381	116	293	3.3	4.0	5	
187	CML78:S(PHMK0.LH193)	66	1419	66	1404	124	304	3.8	4.8	4	
188	CML105:S(LH204)	65	1376	65	1389	118	246	2.0	5.3	5	
189	CML105:S(PHHB4)	67	1441	67	1449	120	271	3.0	5.0	4	
190	CML215:S(PHEW7)	67	1441	66	1411	141	314	4.0	4.8	4/C	Too robust? Perhaps cross to NSS line?
191	CML274:S(LH193)	69	1500	69	1493	124	284	2.5	3.3	4	
192	CML274:S(LH200)	69	1500	69	1493	128	285	2.0	2.3	4	
193	CML274:S(PHEW7)	67	1426	68	1463	119	291	2.0	2.5	4	
194	CML274:S(PHHB9)	68	1463	68	1463	134	296	1.0	2.0	4/C	
195	CML274:S(PHMK0)	68	1478	68	1478	135	308	1.5	2.3	C (A)	
196	CML274:S(PHP38)	68	1463	68	1463	125	286	1.0	1.3	3.5	
197	CML274:S(PHW52)	69	1493	68	1478	124	288	1.5	2.3	4/C	
198	CML274:S(PHMK0.LH193)	69	1493	68	1478	135	289	2.5	3.0	5	
199	CML340:S(LH193)	68	1471	68	1478	134	296	3.0	4.0	5	
200	CML340:S(LH204)	68	1478	68	1478	143	313	1.3	1.8	5	
201	CML340:S(PHHB9)	69	1501	69	1501	139	310	1.0	1.3	C (A)	
202	CML340:S(PHMK0)	70	1515	69	1508	141	310	1.3	1.5	C (A)	
203	CML340:S(PHP38)	68	1471	68	1471	143	314	1.5	1.5	C (A)	
204	CML340:S(PHW52)	69	1500	69	1508	145	316	1.8	2.3	C	
205	CML340:S(PHMK0.LH193)	69	1500	69	1493	135	296	1.8	2.0	5	
206	CML343:S(PHEW7)	67	1441	68	1471	110	275	1.8	2.0	2.5	
207	CML343:S(PHHB9)	68	1463	69	1485	130	303	1.0	1.0	4/C	
208	CML343:S(PHMK0.LH193)	69	1500	69	1508	141	313	1.0	1.3	5	
209	CML264:S(LH204)	68	1471	68	1456	118	285	1.0	1.3	3	
210	CML373:S(DK 2FACC)	66	1396	66	1396	124	278	1.8	3.0	3	
211	CML373:S(DK FBLL)	68	1471	68	1463	111	276	2.0	2.3	4	
212	CML373:S(LH200)	68	1478	68	1471	126	311	2.0	2.0	4	
213	CML373:S(PHHB9)	67	1434	67	1434	130	298	1.0	1.8	4/C	
214	CML373:S(PHK29)	68	1456	67	1441	128	279	1.3	1.8	4	
215	CML373:S(PHW51)	67	1426	66	1396	129	293	1.0	1.0	4	
216	CML373:S(PHW52)	67	1434	67	1434	125	300	1.0	1.5	4	
217	CML373:S(PHW68)	66	1396	65	1374	119	251	1.0	1.0	3.5	
218	CML375:S(LH200)	68	1471	68	1478	126	291	2.0	2.5	3.5	
219	CML375:S(PHHB9)	66	1411	66	1411	130	286	1.8	1.8	4/C	
220	CML375:S(PHW52)	66	1404	66	1411	128	294	2.0	2.3	3.5	
221	CML380:S(LH193)	68	1456	69	1485	120	285	3.0	4.3	3	
222	CML380:S(LH200)	70	1515	71	1545	120	280	2.5	4.0	3	
223	CML380:S(PHHB9)	68	1463	69	1493	128	305	1.5	2.0	4/C	
224	CML380:S(PHP38)	67	1449	68	1478	136	301	1.5	2.3	4/C	
225	CML380:S(PHW52)	68	1478	68	1478	133	304	2.5	3.0	4/C	

Table 4. 2018 Raleigh Breeding Cross Observations

	Pedigree	Silk	Silk	Anthesis	Anthesis	Ear height	Plant height	Disease rating #1	Disease rating #2	Aspect [#]	Notes
		days	GDU	days	GDU	cm	cm	1-9, 1 = best	1-9, 1 = best	1-5, 1 = best	
226	CML420:S(PHP38)	67	1426	67	1426	133	283	1.0	1.8	5	
227	CML438:S(LH193)	66	1396	66	1404	115	268	4.3	4.5	5	
228	CML438:S(GEMS-0113)	67	1449	67	1449	135	308	3.5	4.3	5	
229	CML438:S(GEMS-0200)	67	1426	67	1434	143	301	2.0	3.5	4/C	
230	CML438:S(GEMS-0220)	66	1396	66	1411	126	290	2.3	3.0	4	
231	CML442:S(LH193)	67	1426	67	1441	111	258	2.8	3.5	3	
232	CML442:S(LH204)	66	1419	66	1419	119	283	1.0	1.3	4/C	
233	CML442:S(PHHB4)	69	1485	68	1471	121	281	2.0	2.0	3	
234	CML442:S(PHP38)	66	1418	66	1404	129	286	1.0	1.8	4	
235	CML442:S(PHW52)	67	1449	68	1463	126	279	1.3	2.3	3	
236	CML453:S(LH193)	68	1463	68	1478	129	278	4.3	4.5	4	
237	CML453:S(LH204)	67	1449	67	1434	146	296	1.8	2.3	C (A)	
238	CML453:S(PHEW7)	66	1411	67	1426	133	283	3.3	3.3	4/C	
239	CML453:S(PHHB9)	68	1471	68	1463	149	313	1.8	1.8	C (A)	
240	CML453:S(PHP38)	67	1441	67	1426	145	295	1.3	1.8	C (A)	
241	CML453:S(PHW52)	69	1500	69	1493	138	296	2.5	3.0	C	
242	CML453:S(PHMK0.LH193)	68	1463	68	1463	150	306	2.5	3.8	5	
243	CML486:S(LH193)	64	1360	66	1396	129	285	3.0	3.8	5	
244	CML486:S(LH200)	65	1381	66	1411	135	296	1.5	3.3	5	
245	CML486:S(LH204)	63	1325	65	1367	133	298	1.0	2.0	C	
246	CML486:S(PHHB9)	65	1389	66	1405	141	304	1.3	1.8	4/C	
247	CML486:S(PHMK0)	66	1404	66	1411	136	305	1.0	1.0	4/C	
248	CML486:S(PHP38)	65	1389	65	1389	131	289	1.0	1.0	4	
249	CML486:S(PHW52)	64	1360	65	1381	124	290	2.3	3.0	4	
250	CML486:S(PHMK0.LH193)	65	1389	66	1396	144	309	1.5	2.0	5	
251	CML494:S(LH193)	68	1456	68	1471	138	303	3.0	3.3	5	
252	CML494:S(PHHB9)	69	1485	69	1485	149	308	1.5	1.5	C (A)	
253	CML494:S(PHW52)	68	1478	69	1486	140	310	2.5	2.8	C (A)	
254	CL-02450:S(LH193)	69	1493	68	1478	130	298	1.8	2.0	4	CL-02450 = unreleased line from CIMMYT Popn 24
255	CL-02450:S(LH200)	68	1471	68	1478	141	298	1.3	1.3	3/C	CL-02450 = unreleased line from CIMMYT Popn 24
256	CL-02450:S(PHHB9)	69	1485	68	1478	143	299	1.0	1.0	4/C	CL-02450 = unreleased line from CIMMYT Popn 24
257	CL-02450:S(PHMK0)	72	1596	71	1553	134	279	1.0	1.0	4/C	CL-02450 = unreleased line from CIMMYT Popn 24
258	CL-02450:S(PHP38)	69	1493	68	1463	129	270	1.0	1.0	3/C	CL-02450 = unreleased line from CIMMYT Popn 24
259	CL-02450:S(PHW52)	69	1508	69	1485	123	273	1.3	1.5	4	CL-02450 = unreleased line from CIMMYT Popn 24
260	CL-02450:S(PHMK0.LH193)	69	1485	69	1485	135	309	1.5	1.3	5	CL-02450 = unreleased line from CIMMYT Popn 24
261	La Posta Sequia C7 F64-1-1-1-1-B*3:S(DK 2FACC)	65	1374	65	1381	125	281	2.3	4.0	4	
262	La Posta Sequia C7 F64-1-1-1-1-B*3:S(DK FBLL)	67	1426	66	1396	131	285	2.8	3.8	5	
263	La Posta Sequia C7 F64-1-1-1-1-B*3:S(LH225)	66	1396	64	1360	133	301	3.3	4.8	5	
264	La Posta Sequia C7 F64-1-1-1-1-B*3:S(PHHB9)	67	1426	66	1404	138	314	1.5	2.3	C	
265	La Posta Sequia C7 F64-1-1-1-1-B*3:S(PHK29)	66	1419	66	1396	138	300	1.5	3.3	C (A)	
266	La Posta Sequia C7 F64-1-1-1-1-B*3:S(PHW51)	67	1426	65	1389	139	311	1.3	2.3	C	
267	La Posta Sequia C7 F64-1-1-1-1-B*3:S(PHW86)	66	1404	65	1381	124	266	2.5	3.8	4	
268	La Posta Sequia C7 F64-1-1-1-2-B*3:S(DK 2FACC)	65	1367	65	1389	123	278	2.3	4.8	4	
269	La Posta Sequia C7 F64-1-1-1-2-B*3:S(DK FBLL)	67	1441	67	1426	141	315	3.3	4.3	4/C	
270	La Posta Sequia C7 F64-1-1-1-2-B*3:S(LH225)	66	1396	66	1396	140	304	3.5	6.0	C	

Table 4. 2018 Raleigh Breeding Cross Observations

	Pedigree	Silk	Silk	Anthesis	Anthesis	Ear height	Plant height	Disease rating #1	Disease rating #2	Aspect [#]	Notes
		days	GDU	days	GDU	cm	cm	1-9, 1 = best	1-9, 1 = best	1-5, 1 = best	
271	La Posta Sequia C7 F64-1-1-1-2-B*3:S(PHHB9)	68	1463	68	1463	134	311	1.0	2.3	C	
272	La Posta Sequia C7 F64-1-1-1-2-B*3:S(PHW51)	66	1419	66	1411	136	299	1.5	2.5	C (A)	
273	La Posta Sequia C7 F64-1-1-1-2-B*3:S(PHW86)	65	1381	65	1374	128	269	3.3	4.3	4/C	
274	La Posta Sequia C7 F71-1-1-1-2-B*3:S(LH200)	68	1471	68	1478	134	294	1.8	2.5	C	
275	La Posta Sequia C7 F71-1-1-1-2-B*3:S(PHHB9)	67	1426	67	1426	143	310	1.0	1.0	C (A)	
276	La Posta Sequia C7 F71-1-1-1-2-B*3:S(PHW52)	68	1463	67	1449	130	280	1.8	1.0	4/C	
277	La Posta Sequia C7 F180-1-2-2-1-B*3:S(DK 2FACC)	65	1390	65	1389	128	281	1.0	1.5	4/C	
278	La Posta Sequia C7 F180-1-2-2-1-B*3:S(DK FBLL)	64	1339	65	1374	139	303	2.5	3.3	5	
279	La Posta Sequia C7 F180-1-2-2-1-B*3:S(LH225)	63	1327	64	1339	129	303	2.5	3.8	C	
280	La Posta Sequia C7 F180-1-2-2-1-B*3:S(PHHB9)	65	1368	65	1381	130	308	1.0	1.0	4/C	
281	La Posta Sequia C7 F180-1-2-2-1-B*3:S(PHK29)	66	1396	65	1389	129	299	1.3	1.3	4/C	
282	La Posta Sequia C7 F180-1-2-2-1-B*3:S(PHP38)	66	1404	66	1404	133	289	1.0	1.0	3.5	
283	La Posta Sequia C7 F180-1-2-2-1-B*3:S(PHW51)	66	1404	66	1396	136	301	1.0	1.3	C	
284	La Posta Sequia C7 F180-1-2-2-1-B*3:S(PHW86)	64	1361	64	1354	129	275	1.5	2.0	5	
285	D940Y:S(LH193)	70	1515	68	1471	119	281	3.5	4.3	3	
286	D940Y:S(LH200)	70	1523	69	1508	133	283	2.0	2.3	3.5	
287	D940Y:S(PHHB9)	69	1485	68	1471	134	294	1.0	1.0	3.5	
288	D940Y:S(PHP38)	68	1471	68	1471	134	301	1.0	1.3	4/C	
289	I137TN:S(LH193)	67	1434	67	1441	125	301	4.8	5.3	5	
290	I137TN:S(LH200)	69	1485	68	1471	130	300	3.3	3.5	5	
291	I137TN:S(PHHB9)	67	1441	67	1441	141	326	2.3	2.3	C	
292	I137TN:S(PHMK0)	67	1433	67	1434	125	308	2.5	3.0	5	
293	I137TN:S(PHP38)	67	1426	67	1426	136	300	2.0	2.3	4	
294	I137TN:S(PHW52)	68	1478	67	1449	126	293	3.3	3.3	3.5	
295	KO679Y:S(LH193)	66	1419	66	1419	116	269	4.0	4.5	4	
296	KO679Y:S(LH200)	68	1478	68	1471	109	255	3.0	3.8	3	
297	KO679Y:S(PHHB9)	66	1419	66	1411	124	284	3.0	3.0	3.5	
298	KO679Y:S(PHP38)	67	1441	67	1441	129	289	1.8	2.0	3.5	
299	KO679Y:S(PHW52)	67	1449	67	1441	113	268	3.0	3.3	3.5	
300	KS23-3:S(DK 2FACC)	66	1404	66	1404	123	305	1.0	1.0	4	
301	KS23-3:S(DK FBLL)	66	1419	66	1411	133	320	2.0	3.3	5	
302	KS23-3:S(PHHB9)	68	1463	68	1463	138	315	1.0	1.0	4/C	
303	KS23-3:S(PHK29)	68	1471	67	1434	144	314	1.0	1.5	C (A)	
304	KS23-3:S(PHP38)	67	1426	66	1419	133	310	1.0	1.3	C	
305	KS23-3:S(PHW51)	67	1426	66	1404	129	318	1.0	1.3	C	
306	KS23-3:S(PHW52)	66	1419	66	1411	125	304	1.0	1.0	4	
307	KS23-3:S(PHW86)	65	1374	64	1360	128	290	1.5	2.5	5	
308	KS23-5:S(DK 2FACC)	66	1411	66	1411	115	268	1.5	3.0	5	
309	KS23-5:S(DK FBLL)	67	1426	66	1419	123	290	2.8	4.0	5	
310	KS23-5:S(PHHB9)	67	1426	67	1434	133	306	1.0	1.5	5	
311	KS23-5:S(PHK29)	67	1426	66	1419	123	288	1.0	1.5	4	
312	KS23-5:S(PHP38)	67	1448	66	1419	111	288	1.0	1.0	3.5	
313	KS23-5:S(PHW51)	67	1434	66	1404	116	285	1.3	1.3	4	
314	KS23-5:S(PHW52)	65	1389	66	1396	104	280	1.5	1.8	4	
315	KS23-5:S(PHW86)	65	1381	64	1360	110	263	1.5	1.5	5	

Table 4. 2018 Raleigh Breeding Cross Observations

	Pedigree	Silk	Silk	Anthesis	Anthesis	Ear height	Plant height	Disease rating #1	Disease rating #2	Aspect [#]	Notes
		days	GDU	days	GDU	cm	cm	1-9, 1 = best	1-9, 1 = best	1-5, 1 = best	
316	KS23-6:S(DK 2FACC)	64	1353	65	1389	120	291	1.5	2.5	4/C	
317	KS23-6:S(DK FBLL)	66	1411	66	1419	134	304	2.8	3.0	4/C	
318	KS23-6:S(PHHB9)	66	1396	67	1426	140	293	1.0	1.8	4/C	
319	KS23-6:S(PHK29)	68	1471	68	1471	131	291	2.0	2.0	4/C	
320	KS23-6:S(PHW86)	64	1340	64	1360	133	279	2.0	2.8	C	
321	M37W:S(LH204)	68	1471	67	1434	130	281	1.5	2.5	C	
322	M37W:S(PHHB4)	70	1523	69	1508	131	285	1.8	2.5	C	
323	M37W:S(PHW52)	68	1478	68	1471	123	270	1.8	2.5	4/C	
324	KS1:S(PHEW7)	66	1404	66	1404	125	295	2.3	2.5	C	
325	KS3:S(PHEW7)	68	1456	67	1441	136	313	3.0	4.3	C (A)	
326	NEI402020:S(LH204)	71	1561	69	1500	131	286	2.3	4.8	4/C	
327	NEI402020:S(PHEW7)	66	1404	66	1411	121	288	2.5	4.3	5	
328	NEI402020:S(PHHB4)	70	1523	68	1478	128	308	2.0	4.0	5	
329	CML494:S(LH200)	68	1478	69	1485	134	309	1.5	2.5	C	
330	AC454:N(PHK56)	66	1411	65	1381	116	283	3.8	4.5	5	
331	AC454:N(LH82.DK HBA1)	67	1426	66	1396	124	279	3.5	4.5	5	
332	CML36:N(GEMN-0048)	71	1553	70	1515	148	310	1.0	1.5	C	
333	CML311:N(DK 3IIH6)	66	1419	65	1389	146	314	1.0	1.0	C	
334	CML311:N(DK HBA1)	70	1530	70	1515	143	314	1.0	1.0	C (A)	
335	CML311:N(DK MBWZ)	67	1441	67	1449	141	324	1.0	1.0	C	
336	CML311:N(LH82)	66	1396	65	1389	109	266	2.0	3.3	3	
337	CML311:N(LH168)	67	1441	65	1389	115	283	1.8	2.0	4	
338	CML311:N(LH185)	67	1441	66	1419	121	304	1.0	1.3	4/C	
339	CML311:N(LH213)	68	1478	68	1471	133	313	1.0	1.0	4/C	
340	CML311:N(LH216)	69	1500	69	1485	144	323	1.0	1.0	C (A)	
341	CML311:N(PHK56)	67	1426	66	1396	126	293	2.3	2.8	3.5	
342	CML311:N(PHR55)	67	1449	67	1441	131	288	1.8	2.5	5	
343	CML312:N(LH216)	69	1508	69	1486	138	310	1.8	2.0	C (A)	
344	CML312:N(PHK56)	67	1441	66	1404	124	298	2.3	3.3	3.5	
345	CML312:N(LH82.LH213)	68	1456	67	1441	130	293	2.0	2.5	5	
346	CML318:N(GEMN-0048)	68	1471	67	1441	113	290	2.5	4.0	5	
347	CML318:N(GEMN-0097)	66	1419	65	1389	118	285	3.5	4.8	5	
348	CML321:N(DK 3IIH6)	66	1411	67	1441	123	309	3.5	4.3	4	
349	CML321:N(DK MBWZ)	69	1485	69	1485	131	300	2.0	2.0	C	
350	CML321:N(LH82)	65	1389	66	1404	110	255	4.0	5.8	4	
351	CML321:N(LH168)	66	1411	66	1419	121	276	3.8	5.5	4/C	
352	CML321:N(LH185)	67	1449	68	1456	104	299	1.0	1.8	3.5	
353	CML323:N(DK 3IIH6)	63	1319	63	1313	116	276	2.5	3.5	5	
354	CML323:N(DK HBA1)	66	1411	66	1411	111	274	1.3	2.0	2	
355	CML323:N(DK MBWZ)	65	1375	65	1381	123	281	1.0	2.0	5	
356	CML323:N(LH168)	61	1259	61	1277	110	258	3.0	3.8	5	
357	CML323:N(LH213)	65	1376	65	1369	121	283	2.5	3.3	3	
358	CML323:N(LH216)	66	1411	65	1381	124	281	2.5	2.5	3.5	
359	CML323:N(PHK56)	63	1334	63	1326	110	269	3.8	5.5	5	
360	CML323:N(PHR55)	65	1374	65	1367	103	245	3.8	4.3	5	

Table 4. 2018 Raleigh Breeding Cross Observations

	Pedigree	Silk	Silk	Anthesis	Anthesis	Ear height	Plant height	Disease rating #1	Disease rating #2	Aspect [#]	Notes
		days	GDU	days	GDU	cm	cm	1-9, 1 = best	1-9, 1 = best	1-5, 1 = best	
361	CML349:N(LH168)	62	1307	61	1266	105	269	3.3	5.3	5	
362	CML384:N(DK HBA1)	69	1485	69	1500	135	290	1.0	1.0	C	
363	CML384:N(LH82)	68	1471	67	1449	110	245	1.8	2.3	2	
364	CML384:N(LH168)	68	1478	66	1419	124	274	1.0	1.3	4/C	
365	CML384:N(LH185)	69	1500	69	1485	121	301	1.0	1.0	3.5	
366	CML384:N(LH216)	72	1583	70	1538	135	303	1.0	1.3	C	
367	CML384:N(PHK56)	69	1508	68	1471	131	294	1.0	1.0	4/C	
368	CML384:N(PHR55)	70	1538	70	1515	123	285	1.3	1.0	4	
369	CML384:N(GEMN-0048)	72	1596	71	1568	126	260	1.0	1.0	3.5	
370	CML395:N(LH185)	68	1456	67	1441	125	300	1.3	2.0	4/C	
371	CML395:N(PHK56)	68	1471	68	1456	126	301	3.0	5.5	4/C	
372	CML422:N(LH213)	66	1419	66	1404	103	278	1.3	2.5	2	
373	CML422:N(LH216)	66	1396	64	1347	118	273	2.5	2.5	3.5	
374	CML422:N(PHK56)	65	1368	63	1326	90	266	2.0	3.5	5	
375	CML449:N(LH216)	68	1471	67	1441	131	279	1.5	1.8	C	
376	CML449:N(PHK56)	66	1419	65	1389	121	278	2.0	2.0	3	
377	CML449:N(DK HBA1.LH82)	68	1456	67	1433	128	258	1.3	1.8	4	
378	CML449:N(LH82.LH213)	68	1456	67	1449	126	271	1.5	2.0	3.5	
379	CML451:N(DK HBA1)	68	1478	69	1493	120	285	1.0	1.0	3	
380	CML451:N(LH82)	68	1456	67	1434	94	244	2.0	3.0	3	
381	CML451:N(LH185)	68	1456	68	1456	108	293	1.0	1.0	2	
382	CML451:N(LH213)	70	1515	70	1515	116	296	1.0	1.0	3	
383	CML451:N(LH216)	73	1622	70	1538	116	278	1.0	1.0	3	
384	CML451:N(PHK56)	69	1501	68	1478	106	279	1.0	1.3	3	
385	CML451:N(GEMN-0048)	75	1669	72	1583	121	275	1.0	1.0	3.5	
386	F47:N(PHK56)	67	1434	66	1411	95	264	1.3	1.8	5	
387	Ki21:N(PHK56)	67	1433	67	1426	116	273	1.0	2.3	2.5	
388	M162W:N(DK HBA1)	66	1419	66	1419	124	293	1.0	1.3	4	
389	M162W:N(LH213)	67	1426	67	1434	113	276	1.3	2.3	4	
390	M162W:N(LH216)	67	1426	66	1411	114	250	1.0	1.0	4	
391	M162W:N(PHK56)	66	1404	65	1374	100	254	2.3	4.0	5	
392	NEI 9004:N(DK HBA1)	69	1508	68	1478	116	285	1.0	1.0	4	
393	NEI 9004:N(LH82)	66	1396	65	1389	109	238	2.0	2.5	3	
394	NEI 9004:N(LH185)	70	1515	68	1478	100	263	1.0	1.0	2.5	
395	NEI 9004:N(LH216)	69	1508	68	1478	115	268	1.0	1.0	4	
396	NEI 9004:N(PHK56)	68	1456	67	1434	103	275	1.0	1.0	3	
397	NEI 9008:N(LH82)	69	1486	67	1449	103	235	1.5	1.8	3	
398	NEI 9008:N(LH185)	69	1493	68	1463	106	271	1.0	1.0	3	
399	NEI 9008:N(LH216)	71	1545	70	1515	133	288	1.0	1.0	C (A)	
400	NEI 9008:N(PHK56)	69	1485	67	1449	114	273	1.0	1.3	3.5	
401	CML215:S(LH193)	69	1493	68	1471	131	300	4.0	5.0	4	
402	CML318:N(LH212Ht)	67	1441	67	1434	114	269	1.8	3.0	5	
403	CML318:N(PHR03)	65	1389	65	1381	106	259	3.8	5.8	5	
404	CML319:N(LH212Ht)	69	1493	68	1456	134	286	2.0	4.0	3	
405	CML319:N(PHR03)	69	1485	68	1471	104	270	1.0	1.0	4/C	

Table 4. 2018 Raleigh Breeding Cross Observations

	Pedigree	Silk	Silk	Anthesis	Anthesis	Ear height	Plant height	Disease rating #1	Disease rating #2	Aspect [#]	Notes
		days	GDU	days	GDU	cm	cm	1-9, 1 = best	1-9, 1 = best	1-5, 1 = best	
406	CML451:N(LH212Ht)	69	1508	69	1493	109	278	1.0	1.0	3.5	
407	CML451:N(PHR03)	74	1637	71	1568	113	264	1.0	1.0	4	
408	NEI9004:N(PHR03)	69	1493	68	1463	111	263	1.0	1.0	4/C	
409	NEI9008:N(DK_HBA1)	74	1651	71	1568	105	246	1.0	1.0	3	

C indicates that another cross to a temperate line is needed; (A) indicates that this is a priority for crossing

Table 5. 2018 Breeding Cross Observations - GEM-Ames, Longping - Capron, IL, AgReliant - Ft. Branch, IN

Entry	Pedigree	Pollen GDU Ames	Silk GDU Ames	Pollen GDU Longping	Silk GDU Longping	Pollen GDU AgReliant	Silk GDU AgReliant	Plant Height Ames	Ear Height Ames	Plant Height Longping	Ear Height Longping	Ear Height Rating AgReliant	Plant Health AgReliant	Root Lodging AgReliant	Green Snap AgReliant	Overall Rating Longping	Breeder Rating AgReliant	Ear Position at Harvest Ames	Husk Tight Ames	Husk Long Ames	Ear Size Ames	Ear Qual Ames	Kernel Cap Rating AgReliant	K Color Ames	Grain & Ear Comments Ames
1	Pioneer P0987	1351	1303	1342	1301	1442	1382	240	120	260	100	5	8	9	9	3	8	3	7	6	5	8	'6-7	Y	
2	Pioneer P1151	1261	1248	1261	1280	1296	1324	230	100	270	100	4	7	9	8	1	9	6	5	6	8	7	5	Y	
3	Pioneer 31D58	1392	1392	1515	1437	1471	1471	255	130	300	140	4	7	9	9	6	7	9	4	8	7	7	'6-7	Y	
4	MBS2655/MBS9508	1293	1269	1321	1342	1382	1382	248	115	280	110	5	4	9	8	3	4	5	4	6	7	8	5	Y	
5	MBS3520/MBS8814	1337	1326	1321	1342	1382	1382	255	125	290	110	5	6	9	9	2	7	8	4	5	8	7	2	Y	
6	2FACC//La Posta Seq C7 F64-1-1-1-1-B/LH197//PHW52	1319	1353	1366	1388	1353	1382	245	120	270	100	5	6	9	8	6	7	4	4	7	7	7	'6-9	Y	Short , girthy ear
7	2FACC//Celaya-GTO36/PHP38	1420	1420	1437	1515	1353	1442	250	130	300	140	4	5	8	9	6	5	3	3	7	4	6	'5-8	Y/W	
8	2FACC//Celaya-GTO84/PHP38	1365	1434	1437	1515	1412	1412	285	150	320	160	4	4	7	9	5	4	2	3	2	5	7	'5-7	Y/W	
9	2FACC//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1392	1406	1406	1422	1353	1382	255	145	280	125	5	6	8	9	4	7	3	3	6	5	6	'6-9	Y/W	
10	2FACC//KS23-6/LH204	1337	1337	1366	1406	1412	1412	250	130	280	110	6	6	9	9	4	7	4	3	6	6	7	'6-9	Y/W	
11	2FACC//KS23-6/PHP38	1315	1314	1366	1388	1353	1412	245	130	290	129	4	7	9	9	3	6	5	3	5	6	8	'8-9	Y/W	
12	2FACC//KS23-6/PHW52	1329	1326	1388	1406	1412	1412	240	125	290	130	4	5	8	9	5	5	5	4	6	7	8	'5-7	Y/W	Short girthy
13	2FACC//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/LH197	1351	1365	1437	1437	1382	1382	250	125	290	135	5	3	9	8	4	4	4	3	7	7	7	6	Y/W	
14	2FACC//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/LH204	1365	1365	1388	1406	1353	1353	258	135	280	120	5	3	9	7	5	4	5	2	7	6	6	6	Y/W	
15	2FACC//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/PHP38	1337	1365	1388	1422	1353	1382	250	130	290	130	5	6	9	9	3	6	5	4	6	6	8	'6-7	Y/W	
16	(CML105/LH193)/2FACC	1365	1365	1388	1388	1412	1382	250	115	270	115	5	5	9	8	4	7	6	6	6	6	7	'5-6	Y/W	
17	(PHP38/CML343)/2FACC	1392	1392	1437	1422	1412	1412	240	115	295	135	5	5	9	9	3	6	7	3	7	5	5	'5-8	Y/W	
18	(PHP38/Ki43)/2FACC	1351	1337	1406	1422	1382	1412	250	130	300	125	6	4	9	9	6	6	6	4	8	7	9	'6-8	Y/W	Semi flint
19	3IH6//La Posta Seq C7 F64-1-1-1-1-B/LH197//PHW52	1326	1326	1280	1280	1353	1353	265	140	305	130	4	4	9	9	5	4	9	6	5	7	7	5	Y/W	
20	3IH6//Celaya-GTO36/PHP38	1351	1378	1422	1456	1442	1471	290	155	320	160	4	4	6	9	5	3	2	5	3	5	6	5	Y/W	
21	3IH6//Celaya-GTO84/PHP38	1392	1433	1388	1406	1412	1501	285	160	325	155	4	4	7	8	6	4	5	6	7	5	6	'6-8	Y/W	Long, skinny ear
22	3IH6//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1419	1419	1422	1422	1471	1501	273	150	325	175	5	6	8	8	4	6	5	3	4	5	5	'6-8	Y/W	Some shrunken K
23	3IH6//KS23-6/LH204	1337	1326	1366	1366	1412	1412	275	145	305	150	4	5	7	9	5	5	9	5	7	7	8	'5-8	Y/W	
24	3IH6//KS23-6/PHP38	1447	1550	1437	1535	1442	1501	303	180	340	180	2	4	6	9	7	1	2	4	6	4	5	'7-9	Y/W	Long, skinny ear; flinty
25	3IH6//KS23-6/PHW52	1351	1337	1388	1422	1412	1382	265	125	315	150	4	4	6	8	4	4	9	6	5	7	7	6	Y	Nice
26	3IH6//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/LH195	1351	1351	1406	1406	1412	1412	270	145	320	160	3	4	7	8	5	3	9	7	6	7	7	'4-5	Y/W	Soft dent
27	3IH6//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/LH197	1365	1365	1406	1406	1382	1382	280	150	320	160	3	3	9	7	4	3	9	4	5	4	6	'6-7	Y/W	V small K
28	3IH6//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/LH204	1365	1379	1342	1342	1382	1382	280	155	325	160	3	3	8	9	6	3	7	6	4	7	5	'4-5	Y/W	Soft dent
29	3IH6//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/PHP38	1351	1351	1366	1388	1412	1412	278	150	310	155	5	5	9	7	4	5	9	6	5	8	6	'5-6	Y/W	Soft dent
30	LH195//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1503	1527	1558	1558	1527	1571	270	140	290	145	5	6	9	8	4	7	2	3	4	7	5	'5-7	Y/W	
31	(PHP38/CML287)/LH195	1462	1490	1535	1535	1527	1501	255	130	300	155	5	6	9	9	4	7	3	3	7	7	8	'5	Y	Girthy; Nice
32	LH204//La Posta Seq C7 F64-1-1-1-1-B/LH197//PHW52	1379	1434	1366	1422	1412	1412	265	145	290	130	4	3	9	5	3	5	9	6	5	4	5	5	Y	Small ear
33	LH204//Celaya-GTO36/PHP38	1392	1419	1456	1495	1471	1471	285	165	305	145	4	4	9	8	4	4	6	5	5	7	6	'4-5	Y/W	Soft dent
34	LH204//Celaya-GTO84/PHP38	1406	1462	1406	1495	1471	1547	290	170	305	145	5	4	7	9	6	3	6	5	7	5	4	5	Y	Some K mold
35	LH204//KS23-6/PHP38	1379	1392	1406	1422	1382	1382	268	135	300	130	5	5	9	7	3	5	8	5	7	6	7	'6-7	Y	Nice
36	LH204//KS23-6/PHW52	1379	1379	1321	1388	1382	1412	255	130	260	115	4	4	9	6	5	4	7	6	6	6	5	'5-6	Y	Soft dent
37	LH204//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/LH195	1379	1419	1456	1456	1412	1442	250	140	290	130	5	3	9	6	4	5	5	4	7	7	6	'5-7	Y/W	Soft dent
38	LH204//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/LH204	1379	1434	1422	1456	1442	1412	255	145	280	129	5	3	7	4	3	2	7	4	6	5	4	'4-5	Y/W	Soft dent, some shrunken K
39	LH204//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/PHP38	1351	1392	1342	1406	1353	1382	250	130	290	120	4	4	9	3	5	2	8	5	5	7	7	'5-6	Y/W	Nice
40	LH225//La Posta Seq C7 F64-1-1-1-1-B/LH197//PHW52	1292	1337	1301	1342	1296	1353	240	115	280	115			9	2	2	1	9	8	6	6	6	6	Y/W	
41	LH225//Celaya-GTO36/PHP38	1379	1502	1422	1535	1471	1501	278	145	305	150	5	5	5	7	5	5	2	4	3	4	5	6	Y/W	Small ear
42	LH225//KS23-6/LH204	1337	1365	1342	1388	1382	1382	270	145	305	130	3	4	6	5	6	3	6	7	6	6	8	'5-6	Y/W	Nice
43	LH225//KS23-6/PHP38	1337	1379	1342	1422	1412	1382	265	145	300	150	5	6	8	8	3	7	9	6	6	5	6	'7-8	Y	Nice
44	LH225//KS23-6/PHW52	1326	1365	1366	1388	1353	1382	260	135	300	115	4	5	8	8	4	5	8	8	8	7	6	'6-8	Y	Skinny ears, some mold
45	LH225//La Posta Seq C7 F64-1-1-1-1-B-B-B-1/LH197	1329	1378	1342	1406	1296	1382	275	150	305	145	5	5	9	6	3	4	8	9	5	7	5	'5-7	Y/W	Dent

Table 5. 2018 Breeding Cross Observations - GEM-Ames, Longping - Capron, IL, AgReliant - Ft. Branch, IN

Entry	Pedigree	Pollen GDU Ames	Silk GDU Ames	Pollen GDU Longping	Silk GDU Longping	Pollen GDU AgReliant	Silk GDU AgReliant	Plant Height Ames	Ear Height Ames	Plant Height Longping	Ear Height Longping	Ear Height Rating AgReliant	Plant Health AgReliant	Root Lodging AgReliant	Green Snap AgReliant	Overall Rating Longping	Breeder Rating AgReliant	Ear Position at Harvest Ames	Husk Tight Ames	Husk Long Ames	Ear Size Ames	Ear Qual Ames	Kernel Cap Rating AgReliant	K Color Ames	Grain & Ear Comments Ames
46	LH225//La Posta Seq C7 F64-1-1-1-B-B-B-1/LH204	1282	1351	1342	1388	1324	1382	263	140	305	145	4	4	9	5	3	4	8	8	4	5	6	'3-5	Y/W	Slender ear, dent
47	LH225//La Posta Seq C7 F64-1-1-1-B-B-B-1/PHP38	1337	1406	1388	1437	1353	1382	265	145	300	145	5	6	8	6	4	6	9	7	7	6	7	6	Y/W	Slender ear, dent
48	PHG39//KS23-6/LH204	1419	1420	1456	1456	1471	1471	260	140	300	130	3	8	8	9	4	5	4	6	6	6	8	6	Y	Semi flint, tapered ear
49	PHHB9//KS23-6/LH204	1392	1420	1422	1422	1382	1382	255	130	300	120	5	6	9	8	6	7	6	5	5	7	6	'7-8	Y	Some mold
50	PHHB9//KS23-6/PHW52	1406	1433	1456	1456	1471	1471	250	110	290	110	6	6	9	6	4	7	4	6	5	4	6	8	Y	Flinty, clean
51	PHHB9//La Posta Seq C7 F64-1-1-1-B-B-B-1/PHP38	1419	1419	1406	1456	1412	1442	250	130	290	115	5	5	9	7	3	6	3	2	7	6	6	'7-8	Y/W	Mold
52	PHK29//Celaya-GTO36/PHP38			1456	1515	1471	1501			300	147	2	4	6	9	5	2						6		
53	PHK29//KS23-6/LH204	1406	1406	1422	1437	1442	1471	270	140	302	145	3	5	9	8	3	2	7	6	5	7	7	6	Y/W	
54	PHK29//La Posta Seq C7 F64-1-1-1-B-B-B-1/LH195	1448	1487	1476	1495	1442	1471	260	140	310	165	4	6	7	7	6	5	8	7	7	6	5	'5-7	Y/W	Soft dent, some mold
55	PHP38//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1448	1502	1422	1456	1442	1442	265	145	290	140	4	8	7	8	3	7	5	5	7	7	6	'6-7	Y/W	Good texture
56	PHP38//La Posta Seq C7 F64-1-1-1-B-B-B-1/LH195	1392	1490	1456	1476	1382	1382	255	135	300	140	4	7	9	8	3	6	4	5	5	5	6	'5-7	Y/W	
57	PHW51//Celaya-GTO36/PHP38	1392	1447	1456	1584	1382	1471	280	155	305	150	4	4	8	9	6	3	2	4	3	5	5	6	Y/W	Soft dent
58	PHW51//Celaya-GTO84/PHP38			1422	1584	1442	1471			305	135	3	4	8	9	7	2						6		
59	PHW51//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1419	1475	1406	1456	1412	1471	283	160	305	137	3	5	8	9	4	4	6	7	6	7	7	'6-7	Y/W	Dent
60	PHW51//KS23-6/PHP38	1351	1379	1437	1422	1412	1412	275	145	300	140	2	4	8	9	5	3	9	8	7	5	7	6	Y	Small ear
61	PHW51//KS23-6/PHW52	1365	1392	1406	1422	1382	1382	270	145	300	140	4	5	9	9	4	4	8	8	6	6	7	'6-8	Y	Nice
62	PHW51//La Posta Seq C7 F64-1-1-1-B-B-B-1/LH195	1392	1419	1422	1437	1382	1412	280	150	305	155	3	5	9	9	6	3	3	4	5	7	7	5	Y/W	Slender ear, dent
63	PHW51//La Posta Seq C7 F64-1-1-1-B-B-B-1/LH204	1337	1379	1406	1437	1353	1382	280	145	310	160	3	4	7	8	4	3	9	7	5	6	4	5	Y/W	Dent
64	PHW51//La Posta Seq C7 F64-1-1-1-B-B-B-1/PHP38	1353	1365	1406	1437	1353	1382	280	145	310	150	3	5	9	9	6	4	6	6	6	7	8	'5-6	Y/W	
65	PHW52//La Posta Seq C7 F64-1-1-1-B/LH197//PHW52	1379	1392	1406	1422	1353	1382	260	135	305	130	4	4	9	7	7	5	1	2	3	6	8	'6-8	Dk Y	Nice
66	PHW52//Celaya-GTO36/PHP38	1448	1490	1406	1437	1382	1382	270	150	300	130	3	4	8	9	7	3	4	5	3	4	5	'7-8	Y	
67	PHW52//Celaya-GTO84/PHP38	1379	1406	1456	1515	1412	1412	285	160	305	150	4	7	9	8	7	5	7	6	6	5	7	'7-9	Y/W	
68	PHW52//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1406	1420	1406	1422	1412	1412	270	145	310	150	4	7	8	9	7	7	4	3	5	6	5	7	Y/W	Diplodia ears
69	PHW52//KS23-6/LH204	1379	1379	1388	1342	1353	1382	270	140	305	128	4	4	9	9	6	4	2	3	3	5	7	7	Y/O	
70	PHW52//KS23-6/PHP38	1379	1365	1388	1366	1382	1382	270	140	300	130	4	6	8	8	6	6	9	5	6	6	7	'7-8	Y/O	Good texture, semi flint
71	PHW52//KS23-6/PHW52	1379	1365	1388	1388	1412	1382	265	130	300	130	5	6	7	9	6	6	9	6	6	6	7	'7-9	Y	Semi flint
72	PHW52//La Posta Seq C7 F64-1-1-1-B-B-B-1/LH195	1351	1365	1406	1456	1353	1382	265	135	305	150	3	6	7	8	6	5	9	6	5	6	6	'5-8	Y/W	Soft dent
73	PHW52//La Posta Seq C7 F64-1-1-1-B-B-B-1/LH197	1379	1378	1388	1388	1353	1382	263	140	305	150	5	3	9	8	6	4	9	3	5	6	8	'5-7	Y/W	
74	PHW52//La Posta Seq C7 F64-1-1-1-B-B-B-1/LH204	1379	1379	1342	1342	1353	1353	265	140	300	138	5	4	9	7	6	4	5	6	4	6	6	'5-6	Y/W	Consistent ear size
75	PHW52//La Posta Seq C7 F64-1-1-1-B-B-B-1/PHP38	1367	1407	1342	1422	1382	1382	265	150	290	135	4	6	9	8	5	5	5	6	4	5	7	'6-7	Y/W	Short ears
76	PHW86//La Posta Seq C7 F64-1-1-1-B/LH197//PHW52	1261	1337	1261	1321	1267	1267	255	125	280	110	6	5	9	9	4	7	3	3	3	6	7	'5-7	Y	
77	PHW86//Celaya-GTO36/PHP38	1337	1365	1342	1366	1382	1382	270	155	300	140	2	4	8	9	4	2	6	6	6	5	6	'5-7	Y/W	Soft dent
78	PHW86//Celaya-GTO84/PHP38	1351	1379	1342	1437	1324	1412	268	155	290	140	3	5	9	7	5	3	4	6	7	6	5	'4-5	Y	Too soft
79	PHW86//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1365	1379	1388	1437	1353	1382	258	140	305	150	4	6	9	9	6	6	3	4	6	6	6	5	Y	Dent
80	PHW86//KS23-6/LH204	1305	1337	1342	1366	1353	1353	263	140	290	130	6	5	9	9	3	6	9	5	6	5	7	5	Y	Dent
81	PHW86//KS23-6/PHP38	1314	1337	1301	1321	1324	1324	260	140	290	120	4	4	9	9	3	4	7	6	7	4	7	'5-6	Y	Small ear
82	PHW86//KS23-6/PHW52	1314	1337	1301	1342	1353	1353	260	140	290	125	4	6	9	8	3	5	8	4	7	6	5	'6-7	Y	Soft dent
83	PHW86//La Posta Seq C7 F64-1-1-1-B-B-B-1/LH195	1340	1365	1301	1342	1296	1353	250	140	280	120	4	5	9	9	3	5	4	5	6	6	5	'4-6	Y/W	Soft dent, long slender ear
84	PHW86//La Posta Seq C7 F64-1-1-1-B-B-B-1/LH197	1326	1351	1321	1422	1353	1382	260	140	270	115	5	4	9	8	4	5	3	4	5	7	7	'4-5	Y/W	Dent
85	PHW86//La Posta Seq C7 F64-1-1-1-B-B-B-1/PHP38	1314	1337	1301	1366	1353	1382	260	140	290	125	5	5	9	9	3	6	3	6	6	7	8	5	Y/W	Dent
86	(GEMS-0113/GEMS-0011)/F9214Z	1379	1420	1406	1437	1412	1412	258	135	305	125	5	6	9	7	2	6	2	2	6	7	8	7	Y	Nice
87	(GEMS-0227/CML373)/R3212Z	1365	1365	1388	1388	1353	1382	248	120	280	110	7	6	9	9	1	8	5	4	7	6	9	'7-8	Y/O/W	Semi flint, R/W cob
88	(La Posta Seq C7 F71-1-1-1-2-S40a)/R3212Z	1379	1379	1406	1456	1412	1412	245	120	280	120	7	5	9	7	3	7	6	3	8	7	7	'7-8	Y/W	Semi flint
89	(PHP38/89291)/R3212Z	1351	1365	1406	1437	1412	1412	255	130	300	115	6	5	9	7	2	6	7	6	7	8	6	'6-9	Y/W	Lustrous, semi flint
90	(PHP38/CML287)/R3212Z	1406	1420	1476	1495	1442	1471	260	135	305	135	6	5	9	9	3	7	8	6	6	6	6	9	Y	

Table 5. 2018 Breeding Cross Observations - GEM-Ames, Longping - Capron, IL, AgReliant - Ft. Branch, IN

Entry	Pedigree	Pollen GDU Ames	Silk GDU Ames	Pollen GDU Longping	Silk GDU Longping	Pollen GDU AgReliant	Silk GDU AgReliant	Plant Height Ames	Ear Height Ames	Plant Height Longping	Ear Height Longping	Ear Height Rating AgReliant	Plant Health AgReliant	Root Lodging AgReliant	Green Snap AgReliant	Overall Rating Longping	Breeder Rating AgReliant	Ear Position at Harvest Ames	Husk Tight Ames	Husk Long Ames	Ear Size Ames	Ear Qual Ames	Kernel Cap Rating AgReliant	K Color Ames	Grain & Ear Comments Ames
91	HBA1//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1515	1515	1584	1584	1501	1527	290	175	310	158	5	8	9	9	4	6	3	4	7	7	6	7	Y/W	
92	LH168//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1379	1392	1456	1456	1382	1471	260	145	290	160	4	6	9	9	4	6	3	2	7	6	6	6	Y/W	Mold
93	MBWZ//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1406	1448	1558	1584	1501	1527	275	150	310	167	4	7	9	9	6	7	2	5	4	7	5	6	Y/W	
94	(GEMN-0137/GEMN-0048)/PHG35	1365	1326	1342	1366	1382	1471	213	140	300	135	5	5	9	9	4	6	8	7	5	7	6	'6-7	Y	Dent, some tip damage
95	(PHN37/CA00370)/PHG35	1337	1340	1301	1342	1382	1382	275	135	300	128	6	5	8	9	3	6	9	4	5	7	7	'7-9	Y	Girthly, some tip damage
96	PHJ33//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1462	1475	1456	1495	1501	1547	275	150	300	160	5	6	9	7	4	6	3	3	6	5	6	'6-7	Y/W	Long tapering ear
97	(GEMN-0043/GEMN-0254)/PHG47	1365	1379	1388	1406	1471	1471	263	140	305	120	5	3	9	5	5	7	8	7	5	6	3	'7-8	Y	Soft dent, moldy
98	PHR55//KO679Y/La Posta Seq C7 F64-1-1-1-2-B-B-BJ01	1462	1475	1515	1515	1527	1571	265	140	290	150	5	6	8	8	5	5	3	4	5	7	7	'5-6	Y/W	Girthly, dent
99	(PHN37/CA00370)/LH82	1293	1326	1280	1301	1324	1382	258	130	270	115	6	5	9	8	2	5	9	5	6	6	7	'5-7	Y	

GEM Ames legend:

Data is based on average of 2 reps. 1-9 Scale, 9 is best
 Ear Position at Harvest: 1 - upright, 9 - drooping
 Husk Length: 1 - very short, tip exposed, 5 - just covering the tip
 Planting Date: May 8, 2018

Longping legend:

1-9 score, 1 is always best
 Planting Date: May 17, 2018

AgReliant legend:

1-9 score, 9 is always best
 Planting Date: May 9, 2018

Table 6. 2018 Breeding Cross Observations - GEM-Ames

Set 2

Entry	Heterotic Group	Pedigree	Pollen GDU	Silk GDU	Plant Height	Ear Height	% Barren	Intactness	Ear Position at Harvest	Husk Length	Stay Green	Ear Size	Ear Quality	Kernel Color	Ear & Grain Comments
1	Check	Mo17/B73	1379	1438	325	160	0.0	5	6	5	3	6	5	Y	
2	Check	Pioneer P1151	1268	1268	305	130	0.0	4	6	5	3	7	5	Y	
3	Check	Pioneer 31D58	1402	1414	320	150	5.3	7	5	6	6	8	5	Y	
4	Check	MBS2655/MBS9508	1294	1306	305	115	9.2	4	9	6	4	7	7	Y	
5	Check	MBS3520/MBS8814	1379	1367	325	150	6.3	3	7	5	6	4	3	Y	Soft texture
6	SS	ALTIPLANO BOV903/PHB47//F9214Z	1426	1459	350	175	8.9	5	3	4	3	7	6	Y/O	Excel ears
7	SS	ALTIPLANO BOV903/PHB47//LH195	1483	1547	340	175	13.5	7	2	2	3	4	2	Y	Small ear
8	SS	ALTIPLANO BOV903/PHB47//LH204	1367	1426	350	165	2.8	7	5	4	2	4	4	Y	Soft dent, mold
9	SS	CML375/LH195//PHG39	1483	1473	330	150	2.8	9	4	6	7	6	5	Y	Rough cap
10	SS	CML375/LH195//PHHB4	1426	1460	320	140	0.0	7	4	6	6	7	7	Y/W	Clean
11	SS	CML375/LH195//PHHB9	1450	1438	310	125	0.0	7	7	7	6	4	6	Y/W	Short girthy ears
12	SS	CML375/LH195//PHK29	1460	1438	315	150	6.5	7	3	6	6	7	5	Y	Very girthy, soft cap
13	SS	CML375/LH195//PHW51	1449	1473	330	153	0.0	8	3	6	6	7	6	Y	Rough cap
14	SS	CML375/LH195//PHW52	1414	1427	315	133	2.9	7	5	5	7	7	6	Y	
15	SS	CML375/LH195//R3212Z	1483	1438	315	135	13.4	7	4	6	6	6	6	Y/O	Soft
16	SS	CML375/LH204//PHG39	1470	1462	335	150	3.8	6	3	4	7	6	3	Y/W	Soft, mold
17	SS	CML375/LH204//PHHB4	1491	1511	330	150	0.0	7	5	5	7	9	5	Y	Soft, K cap damage
18	SS	CML375/LH204//PHHB9	1427	1449	310	135	2.8	7		5	7	7	4	Y/W	Rough cap; Short, girthy ears
19	SS	CML375/LH204//PHK29	1483	1483	320	145	5.8	6	3	7	7	7	6	Y/W	Soft cap
20	SS	CML375/LH204//PHW51	1438	1467	325	140	2.9	8	3	5	6	6	5	Y/W	Soft texture, mold
21	SS	CML375/LH204//PHW52	1391	1367	320	138	0.0	6	5	4	5	7	5	Y/W	
22	SS	CML375/LH204//R3212Z	1414	1414	315	140	8.3	6	5	6	6	6	8	Y	Clean, good ears
23	SS	CML375/PHMK0//2FACC	1437	1426	335	155	2.5	8	6	6	7	8	6	Y/W	Soft cap, clean
24	SS	CML375/PHMK0//F9214Z	1491	1529	355	170	0.0	8	2	6	7	3	6	Y	OK, Some kernels red streak
25	SS	CML375/PHMK0//HC33	1427	1438	325	160	12.7	7	4	6	3	6	7	Y/W	Clean, soft cap
26	SS	CML375/PHMK0//LH204	1414	1414	340	155	0.0	6	4	6	4	7	6	Y	Soft cap
27	SS	CML375/PHMK0//LH227	1403	1403	330	150	2.9	6	5	5	2	6	5	Y	Rough cap, heavy ear
28	SS	CML375/PHMK0//R3212Z	1449	1449	320	140	5.4	7	5	6	7	8	5	Y/W	Soft cap, tip damage
29	SS	KS23-6/LH195//HC33	1414	1470	280	113	14.7	4	7	7	1	4	6	Y	Clean
30	SS	KS23-6/LH195//PHG39	1470	1473	335	155	0.0	8	3	5	8	8	8	Y	Clean, nice ears
31	SS	KS23-6/LH195//PHHB4	1491	1483	335	150	2.6	8	5	7	7	7	7	Y	Nice
32	SS	KS23-6/LH195//PHHB9	1437	1438	320	138	5.3	4	3	6	6	7	6	Y	
33	SS	KS23-6/LH195//PHMK0	1555	1549	340	150	0.0	4	4	7	8	4	4	Y	Good, clean
34	SS	KS23-6/LH195//PHW51	1483	1501	330	165	2.9	4	5	6	6	6	6	Y	Slender ear
35	SS	KS23-6/LH195//R3212Z	1410	1400	315	145	2.5	6	6	6	7	6	9	Y	Semi flint, lusterous, long ear

Table 6. 2018 Breeding Cross Observations - GEM-Ames

Set 2

Entry	Heterotic Group	Pedigree	Pollen GDU	Silk GDU	Plant Height	Ear Height	% Barren	Intactness	Ear Position at Harvest	Husk Length	Stay Green	Ear Size	Ear Quality	Kernel Color	Ear & Grain Comments
36	SS	KS23-6/LH204//PHG39	1427	1449	335	155	0.0	8	4	5	7	7	8	Y	
37	SS	KS23-6/LH204//PHHB4	1478	1478	335	155	0.0	6	5	6	5	7	6	Y	Long ear, nice
38	SS	KS23-6/LH204//PHMK0	1511	1511	355	160	0.0	7	5	9	7	7	7	Y	Soft cap
39	SS	KS23-6/PHW52//2FACC	1379	1355	330	150	0.0	5	7	7	5	7	8	Y	Girthy, short ear; lustrous
40	SS	KS23-6/PHW52//F9214Z	1473	1473	340	145	0.0	7	3	5	6	8	9	Y	Long tapered ear, nice
41	SS	KS23-6/PHW52//LH204	1379	1379	325	155	2.9	5	7	6	2	7	7	Y	Nice
42	SS	PHHB4/KS23-6//2FACC	1379	1403	325	160	5.9	7	6	6	5	8	7	Y	Clean, nice ears
43	SS	PHHB4/KS23-6//LH204	1450	1450	345	163	2.8	6	4	5	3	6	8	Y	Slender ear, nice
44	SS	PHHB4/KS23-6//LH227	1414	1414	340	145	0.0	6	4	6	2	5	8	Y	Good cap, clean, small ear
45	SS	PHMK0/KS23-6//2FACC	1317	1354	335	155	0.0	6	7	6	5	7	6	Y	Poor tips
46	SS	PHMK0/KS23-6//F9214Z	1527	1527	365	170	2.9	4	4	5	8	6	5	Y	Some diplodia at base, scattered K mold
47	SS	PHMK0/KS23-6//HC33	1391	1450	340	155	0.0	8	6	7	3	6	7	Y	Clean
48	SS	PHMK0/KS23-6//LH204	1426	1414	350	170	4.8	6	4	6	3	6	6	Y	Scattered K abortion
49	SS	PHMK0/KS23-6//LH227	1414	1450	350	160	11.2	6	4	5	3	6	4	Y	Tip mold
50	SS	PHMK0/KS23-6//R3212Z	1503	1473	335	155	11.6	7	4	7	8	8	7	Y/W	Girthy, nice ear
51	SS	YUCATAN TOL389 ICA/PHB47//F9214Z	1527	1555	365	205	0.0	8	3	4	7	5	7	Y/W	Long slender ear
52	SS	YUCATAN TOL389 ICA/PHB47//LH195	1519	1565	345	178	0.0	8	6	4	3	6	7	Y/W	Variable texture
53	SS	YUCATAN TOL389 ICA/PHB47//LH204	1438	1427	360	180	8.3	8	5	4	4	5	6	Y	Slender ear
54	nSS	ALTIPLANO BOV903/PHZ51//3IIH6	1403	1427	365	170	8.3	5	5	2	2	5	3	Y	K red streak, tip mold
55	nSS	ALTIPLANO BOV903/PHZ51//LH168	1307	1354	350	160	8.5	4	3	3	2	6	6	Y/W	Soft cap
56	nSS	ALTIPLANO BOV903/PHZ51//PHW86	1294	1390	330	165	6.3	6	4	3	3	5	4	Y	Large K, some mold
57	nSS	CML425/LH185]01//PHG35	1478	1491	350	175	0.0	6	3	4	5	7	7	Y/O	Nice
58	nSS	CML425/LH185]01//PHR03	1501	1496	365	165	0.0	4	4	3	6	7	8	O	Slender ear
59	nSS	CML425/LH185]01//PHW86	1233	1377	330	150	6.5	5	3	5	4	6	6	Y/W	Good texture
60	nSS	CML430/LH185//PHG35	1379	1391	340	175	8.8	4	7	5	5	7	8	Y	Nice, long ears
61	nSS	CML430/LH185//PHR03	1391	1391	340	165	0.0	4	6	5	3	9	8	Y/O	Girthy, good ear
62	nSS	CML430/LH185//PHW86	1319	1366	325	150	2.8	6	6	5	4	6	6	Y	Nice
63	nSS	CML449/LH82//LH168	1355	1391	310	140	2.9	4	4	7	3	5	8	Y/W	Clean, small ear
64	nSS	CML449/LH82//MBWZ	1391	1391	340	170	5.3	6	4	5	3	8	7	Y/W	Girthy, clean
65	nSS	CML449/LH82//MM402A	1379	1367	340	155	0.0	6	4	6	4	9	8	Y/W	Girthy, heavy
66	nSS	CML449/LH82//PHG35	1403	1427	330	155	0.0	7	3	7	6	7	8	Y/W	Good texture, clean, girthy
67	nSS	CML449/LH82//PHR03	1403	1403	325	160	2.9	5	5	6	5	9	7	Y/W	Nice
68	nSS	CML449/LH82//PHV53	1437	1450	355	175	6.3	7	4	5	7	7	4	Y/W	Slim ear, nice
69	nSS	F45/DK_HBA1//PHG35	1391	1437	330	145	2.8	4	8	6	3	5	7	Y	Filled to tip, heavy
70	nSS	F45/DK_HBA1//PHW86	1319	1355	325	150	8.5	4	6	6	2	5	5	Y	Mold on butt

Table 6. 2018 Breeding Cross Observations - GEM-Ames

Set 2

Entry	Heterotic Group	Pedigree	Pollen GDU	Silk GDU	Plant Height	Ear Height	% Barren	Intactness	Ear Position at Harvest	Husk Length	Stay Green	Ear Size	Ear Quality	Kernel Color	Ear & Grain Comments
71	nSS	FL_4BT7/LH185//LH168	1379	1391	310	150	0.0	5	6	6	2	7	7	Y	Clean
72	nSS	FL_4BT7/LH185//PHG35	1414	1403	325	155	3.1	6	5	6	5	6	6	Y	Short girthy ear, clean
73	nSS	FL_4BT7/LH185//PHR03	1379	1379	335	150	0.0	6	9	5	4	7	7	Y	Long, slender ear
74	nSS	FL_4BT7/LH185//PHR03	1450	1450	325	165	0.0	5	7	6	3	7	7	Y	Nice
75	nSS	FL_4BT7/LH185//PHV53	1449	1460	345	170	3.3	5	3	7	4	7	8	Y/O	Nice
76	nSS	FL_4BT7/LH82//LH168	1403	1438	300	158	2.8	5	5	6	2	4	7	Y	Clean, small ear
77	nSS	FL_4BT7/LH82//MBWZ	1391	1379	310	150	0.0	4	4	5	3	6	6	Y	Short girthy ear, soft cap
78	nSS	FL_4BT7/LH82//PHG35	1403	1437	325	165	0.0	4	6	6	5	6	6	Y	Clean
79	nSS	FL_4BT7/LH82//PHR03	1403	1449	310	160	0.0	4	6	7	5	7	7	Y	Girthy
80	nSS	FL_4BT7/LH82//PHV53	1473	1493	350	160	0.0	6	4	5	5	7	5	Y	Mold
81	nSS	Jora - ANC 1/PHZ51//3IIH6	1426	1425	385	200	3.1	5	7	3	1	6	4	Y	Small ear
82	nSS	Jora - ANC 1/PHZ51//LH168	1503	1527	360	180	8.7	6	3	5	1	6	4	Y	Soft cap
83	nSS	Jora - ANC 1/PHZ51//PHW86	1379	1402	335	160	13.2	8	5	2	4	4	5	Y	Soft capm small ears
84	nSS	LH185/89343//3IIH6	1379	1379	350	175	7.1	6	4	6	3	7	6	Y/W	Clean
85	nSS	LH185/89343//MM402A	1379	1438	355	165	0.0	6	6	7	3	8	7	Y/W	Clean, soft cap
86	nSS	LH185/89343//PHG35	1367	1391	345	160	0.0	5	7	6	2	8	7	Y/W	Long ears, some K shrink
87	nSS	LH185/89343//PHN18	1379	1414	351	155	0.0	8	4	6	6	7	8	Y/W	Short, girthy ear; variable texture
88	nSS	LH185/89343//PHR03	1379	1425	360	170	2.8	4	9	6	2	7	7	Y/W	Clean
89	nSS	LH185/89343//PHV53	1427	1473	350	170	8.3	6	4	5	6	8	7	Y/W	Long ear, nice
90	nSS	LH185/89343//PHW86	1331	1390	305	165	6.5	5	7	5	4	5	6	Y/W	Soft cap, nice
91	nSS	LH185/CML449//3IIH6	1367	1403	355	170	0.0	5	4	6	4	6	8	Y/W	Clean
92	nSS	LH185/CML449//PHG35	1403	1426	350	165	0.0	6	4	7	6	8	8	Y/W	Girthy, nice ear
93	nSS	LH185/CML449//PHN18	1343	1330	340	150	5.6	7	4	5	6	7	7	Y/O/W	Short, girthy ear; Bright white K
94	nSS	LH185/CML449//PHR03	1403	1414	335	160	2.8	5	7	6	4	8	8	Y/O/W	Long, girthy ear
95	nSS	LH185/CML449//PHV53	1450	1460	365	180	0.0	7	5	7	6	7	8	Y/O/W	Clean, nice ears
96	nSS	LH185/CML449//PHW86	1317	1354	300	150	2.8	6	5	5	4	5	4	Y/W	
97	nSS	LH213/AC454//3IIH6	1367	1367	350	150	10.0	5	6	4	3	5	5	Y	Texture varied
98	nSS	LH213/AC454//MM402A	1414	1438	350	155	0.0	6	8	6	2	8	5	Y	Long ear, heavy dent
99	nSS	LH213/AC454//PHG35	1391	1426	345	150	0.0	5	7	5	6	7	6	Y	Dense kernels
100	nSS	LH213/AC454//PHN18	1367	1366	345	150	0.0	8	6	5	5	8	7	Y/W	Girthy
101	nSS	LH213/AC454//PHR03	1438	1491	350	160	7.7	6	6	6	5	8	6	Y/W	
102	nSS	LH213/AC454//PHV53	1449	1473	340	185	5.6	7	4	4	4	7	6	Y	
103	nSS	LH213/AC454//PHW86	1343	1402	320	160	0.0	7	5	5	5	6	4	Y	Some K shrink
104	nSS	LH82/89343//PHG35	1379	1391	340	140	2.6	5	6	6	2	8	5	Y/W	Girthy, soft texture
105	nSS	LH82/89343//PHR03	1427	1427	360	160	2.6	6	8	6	4	9	7	Y/W	Girthy, variable K texture, nice

Table 6. 2018 Breeding Cross Observations - GEM-Ames
Set 2

Entry	Heterotic Group	Pedigree	Pollen GDU	Silk GDU	Plant Height	Ear Height	% Barren	Intactness	Ear Position at Harvest	Husk Length	Stay Green	Ear Size	Ear Quality	Kernel Color	Ear & Grain Comments
106	nSS	LH82/89343//PHW86	1330	1342	310	140	2.8	5	6	6	4	5	4	Y	Very soft, some mold
107	nSS	PHN37/CML449//3IIH6	1294	1317	325	165	3.1	5	6	6	3	6	4	Y/W	
108	nSS	PHN37/CML449//LH168	1307	1342	315	160	13.2	5	4	5	3	6	7	Y/W	Nice
109	nSS	PHN37/CML449//MBWZ	1355	1343	340	160	7.5	6	4	6	4	7	5	Y	Soft texture, clean
110	nSS	PHN37/CML449//MM402A	1317	1330	345	155	2.9	7	7	5	3	7	7	Y/W	Girthy, clean
111	nSS	PHN37/CML449//MM501D	1343	1367	315	140	0.0	5	6	5	2	6	7	Y/W	Clean
112	nSS	PHN37/CML449//PHW86	1246	1282	310	135	5.3	6	4	6	5	6	5	Y/W	Girthy
113	nSS	PHZ51/KCELO BOV948//3IIH6	1355	1367	380	175	13.0	4	7	4	1	6	3	Y	Some mold
114	nSS	PHZ51/KCELO BOV948//LH168	1354	1426	330	155	28.3	5	6	3	2	5	2	Y	Mold
115	nSS	PHZ51/KCELO BOV948//PHW86	1282	1366	315	155	19.0	5	6	7	3	4	4	Y/W	K red streak, red halo
116	nSS	YUCATAN TOL389 ICA/PHZ51//3IIH6	1450	1483	385	185	5.9	5	7	5	4	5	5	Y/W	Clean, small ear
117	nSS	YUCATAN TOL389 ICA/PHZ51//LH168	1427	1491	340	165	11.6	7	4	6	2	7	6	Y/W	K red streak, girthy
118	nSS	YUCATAN TOL389 ICA/PHZ51//PHW86	1330	1355	325	160	8.8	5	4	6	4	6	4	Y/W	Variable texture, K mold

GEM Ames legend:

Data is based on average of 2 reps. 1-9 Scale, 9 is best

Ear Position at Harvest: 1 - upright, 9 - drooping

Husk Length: 1 - very short, tip exposed, 5 - just covering the tip

Planting Date: May 24, 2018

Annual Reports

2018 Annual Report of the GEM Project, Ames, IA and Raleigh, NC

PERSONNEL:

Ames: *USDA-ARS Plant Introduction Research*

Dr. David Peters, Ames GEM Coordinator
 Michael Peters, GEM Technician
 GEM Support Scientist (vice-Engstrom, Vacant)
 Dr. Mack Shen, IT Specialist

Dr. Candice Gardner, Research Leader

Raleigh: *USDA-ARS Plant Science Res.*

Dr. Matt Krakowsky, Southeast GEM Coordinator
 Dr. Peter Balint-Kurti, Research Geneticist
 Dr. Jim Holland, Maize Research Geneticist
 Dr. David Marshall, Research Leader

Raleigh: *North Carolina State University*

Dr. Major Goodman, William Neal
 Reynolds Distinguished Professor
 Dale Dowden, Technician

GEM - Ames Highlights

Midwest Germplasm releases and development:

- Three hundred and twelve (312) GEM releases will now be available to GEM Cooperators. A total of 329 (312+17) have been released, including those from our university collaborators.
- Seven S3 GEM lines from the Ames program are proposed for release to GEM Cooperators for the 2019 planting year. Yield data can be found online and in the handout for 2019 released lines. Ear and grain characteristics are presented in Table 8, and topcross maturity and ear height in Table 9. NIR results for protein, oil, and starch can be found online.
- Three of the seven releases are second cycle GEM lines from GEMS-0162, derived from CUBA117, an Argentino line from Cuba; GEMS-0227, derived from NEI9004, a tropical inbred from Thailand; CHIS775, a Tuxpeño line from Mexico; and GEMN-0097, derived from Florida synthetic FS8B.
- Summary tables of test cross data are presented in the section of this book tabbed 'Released Lines.'

Table 7. 2019 Ames-GEM Germplasm Releases (7)

GEM Code	Pedigree	Race	Country	Type	Het. Group
GEMS-0303	(GEMS-0162/GEMS-0227)-040-002-001	Argentino / Tropical Inbred	Cuba/Thailand	25% Exotic	SS
GEMS-0304	(GEMS-0162/GEMS-0227)-046-001-001	Argentino / Tropical Inbred	Cuba/Thailand	25% Exotic	SS
GEMS-0305	(GEMS-0227/PHP38)-018-001-001	Tropical Inbred	Thailand	12.5% Exotic	SS
GEMS-0306	((LH195/KO679Y)/GEMS-0227)-010-001-002	Tropical Inbred /Tropical Inbred	South Africa /Thailand	37.5% Exotic	SS
GEMS-0307	((PHB47/CML373)/GEMS-0162)-SIB-053-002	Tropical Inbred /Argentino	Mexico / Cuba	37.5% Exotic	SS
GEMS-0308	((PHB47/CML373)/GEMS-0162)-SIB-086-001	Tropical Inbred /Argentino	Mexico / Cuba	37.5% Exotic	SS
GEMN-0309	ATL100:N(LH82)(GEMN-0097)-090-001	Tropical Hybrid	Brazil	25% Exotic	NS

Table 8. 2019 GEM-Ames Released Lines – Ear and Grain Traits

GEM Code	Poll GDU	Cob Color	Grain color	Grain Texture
GEMS-0303	1407	White	Yellow	Semi-Dent
GEMS-0304	1355	Seg R/W	Yellow	Semi-Dent
GEMS-0305	1355	White	Yellow	Semi-Dent
GEMS-0306	1391	Pink	Yellow	Dent
GEMS-0307	1427	White	Yellow	Semi-Dent
GEMS-0308	1375	Red	Yellow	Semi-Dent
GEMN-0309	1334	Red	Yellow	Semi-Flint

Table 9. 2019 GEM-Ames Released Lines – Topcross RM and Ear Height

GEM Code	Pedigree	Average	
		Estimated RM	Ear Height (cm)
GEMS-0303	(GEMS-0162/GEMS-0227)-040-002-001	110	114
GEMS-0304	(GEMS-0162/GEMS-0227)-046-001-001	110	110
GEMS-0305	(GEMS-0227/PHP38)-018-001-001	109	115
GEMS-0306	((LH195/KO679Y)/GEMS-0227)-010-001-002	110	125
GEMS-0307	((PHB47/CML373)/GEMS-0162)-SIB-053-002	115	123
GEMS-0308	((PHB47/CML373)/GEMS-0162)-SIB-086-001	115	120
GEMN-0309	ATL100:N(LH82)(GEMN-0097)-090-001	110	120
	Hybrid Checks		
	MBS2655/MBS9508	~109-110	121
	MBS3520/MBS8814	~111	121
	Pioneer P0987	~109	122
	Pioneer P1151	~111	108
	31D58	~114	130

New Germplasm:

- Twelve tropical lines donated to GEM by Kasetsart University were planted for seed increase in greenhouse quarantine by the maize curatorial staff last winter. Seven inbred lines and one tropical population became available to GEM for breeding population starts. The remaining three inbred lines and one tropical populations will be available for breeding population starts in 2019.

2018 Research & Breeding Activities:

- Fourteen new breeding cross populations were sent to seven Cooperators for in-kind support.
- Thirty families of S1 ears were advanced to S2 in Ames, and two families were advanced by Cooperators and S2 ears returned. These S2s will be topcrossed in isolated blocks in 2019.
- An automated shade structure donated to Iowa State University by Monsanto was utilized to generate new 50% breeding crosses. One hundred twenty-five 50% exotic crosses generated. Special focus was placed in initiating populations with tropical lines donated to the germplasm collection by Kasetsart University. Table 10 provides a summary of the lines included in the shade structure.

Table 10. Generation of Breeding Crosses in 2018 Ames Photoperiod Control Shade House

Pollen Donors			Temperate Females	
Generation	Pedigree	Cross To	Heterotic Group	Pedigree
Inbred	55T4	SS/NS	SS	HC33
Inbred	55T5	SS/NS	SS	LH195
Inbred	55T6	SS/NS	SS	LH204
Inbred	Ki30	SS	SS	LH227
Inbred	Ki48	NS	SS	PHHB4
Inbred	Ki20	SS	SS	PHHB9
Inbred	Ki55	SS	SS	PHMK0
Inbred	Ki59	SS/NS	SS	PHW52
Inbred	Kei1421	SS/NS	NS	LH185
Inbred	Ki45	NS	NS	LH213
Population	KS23(S)C5	SS	NS	LH216
Accession	Tuxpeño-BVIR 153	SS	NS	MBWZ
Accession	Tuxpeño-VER 147	SS	NS	PHJ33
Accession	Tuson/Criollo-BVIR 155	SS/NS	NS	PHK56
Accession	Cubano Amarillo-BVIR 102	NS	NS	PHR55
Accession	Coastal Tropical Flint-BVIR 104	NS	NS	PHV53
Accession	Haitian Yellow-BVIR 127	NS		
Accession	Early Carribean-BVIR 139	NS		
Accession	Canilla-BVIR 106	SS/NS		
Accession	Chandelle-BVIR 116	SS/NS		

- Winter nursery returns from Puerto Vallarta, Mexico were excellent. Breeding cross development to make new 25% tropical populations was highly successful with excellent quantities and quality. A hand pollination nursery supporting line advancement and breeding cross development, and one isolated crossing block to generate topcross material for yield trials have been sent to Puerto Vallarta for the current winter cycle.
- The yield test site at Atlantic, Iowa added to the GEM Program in 2017 provided excellent data for green snap. Storms in early July caused significant snapping of plants. Much of the border hybrid used at this location sustained 80-90% snapped plants. The damage was highly uniform across the field. Ten of the forty-five trials involved germplasm that had very low green snap counts. Yield data for the remaining thirty-five trials was not included in the yield summaries.

Host Plant Resistance

- 2018 disease data will be posted online at our website (<http://www.public.iastate.edu/~usda-gem/>) in January. Mack Shen has added all historical disease evaluation information to the PRISM database.
- Pathology and entomology research collaborators from the U.S. private and public sectors screened GEM releases for Northern Leaf Blight (NLB), Southern Leaf Blight (SLB), Goss's Bacterial Wilt (GW), Gray Leafspot (GLS), Fusarium ear rot (FUSERS), Anthracnose Stalk Rot (ASR), Aspergillus (aflatoxin and other mycotoxins), and Bacterial Leaf Streak (BLS).
- International collaborators evaluated GEM releases for Late Wilt, Tar Spot, agronomic traits, and ear mold.

Appreciation is extended for all in-kind support and extensive efforts by private and public GEM Cooperators:

- Corteva (DuPont/Pioneer Hi-Bred International) provided Fusarium ear mold data and head smut data (Marc Mancl) from their Woodland, California site. Northern leaf blight disease data (Scott Heuchlin and Rick Blum) was provided from their central Iowa site.

- Professional Seed Research (Jim Dodd) provided data for NLB.
- USDA-ARS-PSRU in Raleigh, NC provided data for GLS, SLB (Peter Balint-Kurti) and Fusarium ear rot (Jim Holland).
- USDA-ARS-CHPRRU, Mississippi State, MS (Paul Williams and Gary Windham) evaluated aflatoxin in grain.
- University of Nebraska, Lincoln (Tamra Jackson-Ziems and Brad Tharnish) provided data for BLS.
- Wyffels Hybrids (Chris Eichhorn) planted a trial of GEM lines for GW screening. Disease development was too poor this year for meaningful data collection.
- Trimble Genetics conducted a Tar Spot trial at their site in southern Mexico. The level of infection was too low this year for meaningful data collection.

Ames 2017 Allelic Diversity (AD) and Double Haploids (DH):

- The Iowa State University Doubled Haploid Facility continues to partner with the GEM Project on development of DH lines. Approximately 204 lines (representing ~52 races) were jointly released by ISU and USDA-ARS in 2014 as part of the Allelic Diversity Project. Approximately 24 sets of these lines have been distributed to requestors, and numerous small subsets have been requested. They provide unique genetic resources for a wide variety of research applications. A new set will be released in 2019, pending processing and quality assurance.
- DH₂ lines were increased (154 rows), 22 lines assigned BGEM codes were increased for distribution and 42 candidates for coding were increased and evaluated.
- DH₂ lines generated by Monsanto from AD BC₁'s supplied by the Raleigh program were planted in the nursery for increase and observation. Three hundred rows involving 35 landraces in 36 populations were included.
- DH₁ lines of from AgReliant that were grown and selected in 2017 were topcrossed in 2018 for 2019 testing.
- Dr. Uschi Frei provided rows in her induction iso to induce 19 new BC₁'s received from Raleigh.
- We did not advance any BC₁F₇ allelic diversity project germplasm in 2018. This effort has been tabled for now.
- Please see Raleigh-GEM's report on their AD efforts, as Raleigh generates the BC₁ lines that are transferred to Ames for induction.

Ames 2018 Yield Test, Nursery and Other Highlights:

- Cooperator in-kind trial support contributions are detailed in Table 12.
- Approximately 17,900 plots (2815 entries) were managed or coordinated through Ames in 2018.
- Of the core development program, 5,088 plots (32.5%) were devoted to 2nd year trials and 10,584 (67.5%) were in 1st year trials. We lost seven test replications due to weather or site variability. Thirty-five additional tests from the Atlantic location were used only for green snap data.

Table 11. Ames and Cooperator Yield Trial Resource Summary

Trial Type	# Entries	# Plots - GEM-Ames	# Plots - Private Coops	# Plots - GEM-Raleigh	Total Plots
1st Year Trials	1764	8820	1764	0	10584
2nd Year Trials	636	3180	1908	0	5088
Released Line Trials	0	0	0	0	0
Collaborator Trials	415	2230			2230
Totals	2815	14230	3672	0	17902

- One hundred ninety (190) top crosses out of 2,400 GEM entries exceeded the mean yield of the check hybrids in Midwest trials in 2018. Of the 190 hybrids that exceeded the mean, 105 were from first year trials, and 85 from second year trials.

- The five standard checks used in this year's trials included:
MBS2655/MBS9508 MBS3520/MBS8814
Pioneer P0987 Pioneer P1151 Pioneer 31D58.
- As you review the yield trial information, keep in mind the nomenclature of the GEM trial naming system:
 - First two digits are the year, i.e. "15" for year 2015
 - Third digit is for homologous area (1=tropical, 5=temperate, 6=both, 7=other)
 - Fourth digit indicates percentage of exotic; 0 = mix of 25% or 50% exotic derived; 2=50% exotic; 3 = 25% exotic; 4 = other (i.e. GEM x GEM or Cooperator derived germplasm);
 - Fifth digit is the testing stage (1=1st year test, 2=2nd year test, 3=other)
 - Sixth and seventh digits are sequential numbers.
 - For example: "1652102" would be a 1st year TPX trial grown in 2016, comprised of temperate 50% exotic crosses.

Nursery and isolation rows:

- Approximately 6,482 nursery rows were pollinated
 - 4,265 selection rows
 - 1,482 various types of increase rows
 - 308 crossing block rows
 - 322 shade house crossing rows
 - 1,196 observation rows
 - 2,568 Ames isolation rows
 - 200 isolation rows were contributed by CRD
 - 2,000 isolation rows were contributed by MBS Genetics
 - Not included in the count are the numerous nursery rows grown by Cooperators for in kind support to generate breeding crosses, S1 families, etc.
- Ninety-four new breeding crosses were observed and evaluated for breeding potential in Ames, Iowa, Capron, Illinois, (Cooperator) and Ft. Branch, Indiana (Cooperator). Results for this multi-site observation set are presented in the section labeled 'Breeding Crosses'. One hundred thirteen additional new 25% breeding crosses were evaluated for breeding potential in Ames, IA. Results for this set can also be found in the 'Breeding Crosses' section. One hundred eighty-eight new 50% tropical breeding crosses were evaluated for breeding potential in Ames, Iowa and Union City, Tennessee. This set was evaluated to select candidates for making new 25% breeding crosses in winter nursery. In total, 395 breeding crosses were observed.

Quality Traits (including grain mold/mycotoxin)

- NIR data was collected on newly released lines and the BC observation open-pollinated ears. Data will be published on the GEM website. The newly released GEM lines were not noteworthy for protein, oil, or starch traits.
- Mycotoxin screening focused on the lines included in the top 48. Data have been received and will be posted to the website. One GEM Ames line (GEMS-0096) showed low aflatoxin levels in 2018 trials with 39 ng/g as compared to B73 with 3545 ng/g and Mo17 with 3421 ng/g. Three Raleigh lines also showed low aflatoxin levels in the same trial with GEMS-0027 at 48 ng/g, GEMN-0257 at 65 ng/g, and GEMS-0258 at 47 ng/g.

New GEM Cooperators in 2018:

One new private U.S. Cooperator joined the GEM Project in 2018; Renk Seed Company of Sun Prairie, Wisconsin was accepted in March. One NGO U.S. based Cooperator joined the GEM Project in 2018; Mandaamin Institute of Elkhorn, Wisconsin was accepted in September. Two new international private Cooperators joined the GEM Project in 2018. Helix Semintes E Mudaz, Ltda from Brazil was accepted at the end of 2017 and K2 Seed (Klein Karoo) from South Africa and Zimbabwe was accepted in September 2018.

Ames, Iowa GEM Project 2018 Field Day: Approximately 80 visitors participated in the 2018 Ames GEM Field Day on Wednesday, September 26th. Several groups of students, breeders, and the general public continued to visit through mid-October, including numerous international visitors.

Top 10 Project:

- The purpose of the ‘Top 10’ project was to test the 48 released lines considered to be among the best of the SS and NSS GEM releases on an array of testers, sufficient to calculate GCA and SCA estimates. The information would be useful for assessing potential value of the top 10 SS and top 10 NSS lines for recycling in different breeding programs and other purposes and inform on best heterotic combinations. This project was started in 2016 with the first yield trials conducted in 2017 by AgReliant Genetics, Dow AgroSciences, DuPont-Pioneer, Monsanto, and Syngenta. The project was extended for a second year of testing to enhance the resulting summary.
- The top 48 GEM release lines programs (Table 13) were again distributed to four private sector TSG members for inclusion in 2017 winter nurseries. The lines were crossed to current elite testers from each program and included in 2018 yield trial experiments within each company.
- Yield trials were planted at locations including sites inside and outside of the Corn Belt.
- Yield trial data and observations have been received and are currently being evaluated. General combining ability (GCA) and specific combining ability (SCA) are being determined for this set of top GEM releases. Preliminary analysis of the data has provided some insights on the performance of GEM lines included in the study. Analyses will continue, and results will be published.
- Initial review of the data has provided some insights of the GCA and SCA of the top GEM releases. These insights will help guide and accelerate recycling within GEM and provide valuable guidance to GEM Cooperators for breeding and line development.

Ames GEM Program Goals

The Ames GEM Program has identified several areas for changes planned for 2019 and beyond.

Nursery:

- Efforts to generate new breeding cross populations of 50% and 25% exotic content will be included as an annual focus of the program. The breeding cross observation system will be organized to evaluate 100-120 25% exotic populations each year at a minimum of three sites (to be determined). Additional breeding cross observation sets will be grown for those not included in the multiple site trial.
- Utilize the recently acquired color sorters to enhance and expand specialty breeding efforts. One color sorter will allow program to separate color segregates within breeding populations to better meet the needs of GEM Cooperators and to remove damaged kernels. The second color sorter combines NIR and vision and will be used as a research instrument.

Isolated Crossing: Isolated crossing capacity will be expanded and enhanced through internal, external contract, and available in-kind support capacity.

Yield Trials: Focus on yield trial seed quality using recently acquired shelling and seed processing equipment. The new AEC bulk sheller and VMek color sorter will be utilized to improve plot uniformity and stand establishment. The sheller will reduce seed damage incurred during the shelling operation. The color sorter will remove damaged and diseased kernels resulting in higher, more consistent seed quality and germination. The color sorter will also be used to maintain more consistent seed size and plantability.

Disease Evaluation:

- Domestic evaluation capacity for key diseases such as Goss’s Wilt, Tar Spot, and Bacterial Leaf Streak will be explored to provide enhance documentation of released GEM lines and candidate lines.

- Options to expand international disease evaluation capacity for diseases not yet in the US (and for endemic diseases with unique pathogen races) will be explored within our Cooperator network, and Cooperators sought who can contribute.
- The system for disease reaction evaluation of new and previously released GEM lines will be expanded to provide more complete characterization and documentation of germplasm potential. Data summary system to allow clear identification of disease documentation will be included on the website.

Table 12. Private Collaborator In-Kind Support – Summer 2018

Collaborator	Breeding & Nursery Support	Breeding Cross Obs	Made Top Crosses	Yield Trials	Disease Screening	Top 10 Project' Trials
Ag Reliant Genetics, LLC		X	X	X		X
Becks Superior Hybrids			X	X		
CRD		X	X	X		
DKD Genetics	X			X		
Dow AgroSciences				X		X
DuPont-Pioneer			X	X		X
GEM-Raleigh		X				
Illinois Foundation Seed, Inc				X		
KMR (Summit Genetics)				X		
Longping NA	X	X		X		
Masters Choice	X					
MBS Genetics			X	X		
MDS				X		
Misr Hy Tech					X	
Monsanto Company	X		X	X		X
Professional Seed Research					X	
Renk Seed Company	X					
Syngenta	X					
Terrell Seed Research	X	X				
USDA-ARS (Balint-Kurti)					X	
USDA-ARS (Holland)					X	
USDA-ARS (Williams)					X	
Wyffels Hybrids				X	X	

Sincere thanks for the dedication and efforts of the maize community to ensure the availability of useful maize genetic diversity, and especially for their support of the GEM projects in Ames and Raleigh.

Table 13. 48 Lines Included in the ‘Top 10’ Project

Origin	GEM NS lines	Background	Origin	GEM SS lines	Background
Ames	GEMN-0048	DKXL370 (Brazil)	Ohio State	GEMS-0002	FS8A(s)
Ames	GEMN-0096	DKXL370	Raleigh	GEMS-0027	DKXL370 (Brazil)
Ames	GEMN-0097	FS8B(T)	Raleigh	GEMS-0032	DKXL380 (Brazil)
Ames	GEMN-0098	FS8B(T)	Ames	GEMS-0049	DKB844 (Mexico)
Raleigh	GEMN-0104	DK888 (Thailand)	Ames	GEMS-0050	DKB844 (Mexico)
Raleigh	GEMN-0124	DK212T (Brazil)	Ames	GEMS-0061	Cristalino Colorado (Argentina)
Raleigh	GEMN-0135	DKXL380 (Brazil)	Ames	GEMS-0066	Argentino (Cuba)
Ames	GEMN-0144	Cuban Yellow (Peru)	Ames	GEMS-0072	Tuxpeno (Mexico)
Ames	GEMN-0157	Dente Amarello (Brazil)	Ames	GEMS-0093	Cuba 164 (Mixed Creole)
Ames	GEMN-0177	DK888 (Thailand)	Ames	GEMS-0113	Tuxpeno (Mexico)
Ames	GEMN-0178	DK888 (Thailand)	Ames	GEMS-0115	DKB844 (Mexico)
Ames	GEMN-0187	Antigua	Ames	GEMS-0142	Dente Amarelo (Brazil)
Ames	GEMN-0192	Tuson (St. Croix)	Ames	GEMS-0147	Thailand inbred
Ames	GEMN-0207	Cateto (Brazil)	Ames	GEMS-0200	Suwan Composite (Brazil)
Ames	GEMN-0225	Suwan Composite (Brazil)	Raleigh	GEMS-0215	Thailand inbred
Raleigh	GEMN-0232	Tuson (St. Croix)	Ames	GEMS-0219	GEM x GEMS-0002; Cuba 164 x FSA8(s)
Ames	GEMN-0238	Thailand inbred	Ames	GEMS-0220	GEM x GEM; Tuxpeno / Olotillo
Raleigh	GEMN-0257	Tuxpeno (Mexico)	Ames	GEMS-0226	Tuxpeno Composite (Brazil)
Raleigh	GEMN-0270	Croiollo (Antigua)	Ames	GEMS-0227	Thailand inbred
Raleigh	GEMN-0271	Suwan Composite (Brazil)	Ames	GEMS-0235	Criollo/Tuso (Cuba)
Raleigh	GEMN-0272	GEMN-0043 x GEMN-0097 Cateto / FS8B(T)	Ames	GEMS-0237	DKXL370 (Brazil)
Raleigh	GEMN-0287	GEMN-0108 x GEMN-0178 DK888 / DK888	Raleigh	GEMS-0243	CML 287 (CIMMYT)
			Raleigh	GEMS-0245	DK888 (Thailand)
			Raleigh	GEMS-0255	FS8B(S)
			Raleigh	GEMS-0258	DKB830 (Mexico)
					GEMS-0032 x GEMS-0113
			Raleigh	GEMS-0274	DKXL380 / Tuxpeno

2018 Annual Report of the GEM Project

GEM-Raleigh Highlights

Germplasm releases:

- Three new GEM lines are being recommended from the Raleigh program in 2019; one entry is a recycled line from a GEM Raleigh release (GEMN-0104) and an Ames release (GEMN-0097), another entry is from BR106, and the third is from PASCO14. Yield data for experiments M1 (2nd year NSSS entries) and M3 (2nd year SSS entries) can be found in this book or on the GEM website (after January 1). There was one other line from experiment M3 that was considered for release, BR51675:D27S21-011-01, but it had poor seed quality in the nursery this summer. We will try to increase it again in 2019 and will possibly release it in 2020, depending on the resulting seed production and upon further yield trialing.

GEM code	Pedigree	Race	Country	Type	Heterotic group
GEMN-0310	(GEMN-0104/GEMN-0097)-070-003	Mixed	Thailand/USA	37% exotic	nSSS
GEMS-0311	BR106:S42-063-002	Tuxpeño	Brazil	50% exotic	SSS
GEMS-0312	PASCO14:S11a-128-003	Cuban yellow	Peru	50% exotic	SSS

Germplasm development:

- Approximately 1200 GEM nursery plots and 1000 GEM isolation plots were grown in Clayton, NC, while 660 nursery plots were planted in Homestead, Florida in September 2018 and 150 plots were sent to winter nursery in McAllen, Texas. Unfortunately an early frost appears to have severely damaged the plots in Texas.
- Development of S₁ families was attempted from ten breeding crosses:

ATL100:N(GEMN-0048)	GEMN-0270/GEMN-0048
POPN 32 IST C2:N(GEMN-0048)	ATL100:S(GEMS-0220)
POPN 35 IST C2:N(GEMN-0048)	GEMS-0243/GEMS-0256
ATL100:N(DK_MM402A)	GEMN-0272/GEMN-0104
(CML313/CML422):N(DK_HBA1/LH185)	GEMN-0272/GEMN-0287
- Families from seven GEM breeding crosses were advanced from S₁ to S₂:

GEMN-0048/GEMN-0232	GEMN-0097/GEMN-0135
GEMN-0048/GEMN-0257	GEMN-0124/GEMN-0104
CA00370:N(GEMN-0097)40x	GEMN-0124/GEMN-0158
GEMN-0135/GEMN-0137	
- Twenty-eight new recycling combinations were produced based on performance in yield trials.
- Twenty-four new breeding crosses were developed between 50% exotic breeding crosses and GEM-Ames releases (GEMN-0097, GEMS-0220, and GEMS-0227).
- Development of over 200 new breeding crosses is being attempted in winter nurseries, mostly combinations of exotic accessions and inbreds crossed to temperate inbreds.

Germplasm Evaluations:

- Overall, about 9500 yield plots were coordinated from Raleigh, with about half planted at five locations in NC and the rest planted by seven cooperators at fifteen locations throughout the Southeast and Midwest.
- Thirty-three experimental entries were evaluated at eighteen locations in second-year trials (experiments M1 and M3; see Yield Trials section and above releases).
- Five hundred and seventy-four entries were evaluated in first-year trials, a small number of which will be evaluated in second-year trials in 2019, along with a few of the top performing entries from experiments M1 and M3.
- Evaluations of GEM releases from Raleigh and Ames were included in experiments M1 and M3 to identify lines with the best potential for use in GEM x GEM crosses; entries included GEM releases that have performed well in previous trials as well as newer entries that had not yet been evaluated in head-to-head experiments. Summary tables are presented in the Yield Trials section of this booklet, and complete results will be available on the GEM website after January 1. Recycling efforts will continue in 2019 with the best lines from experiments M1 and M3 (some of which did not quite warrant release) and earlier GEM releases.
- Approximately 500 breeding crosses were observed in Raleigh in the summer of 2018, and some of the results are presented in the breeding cross section.

The following breeding crosses are currently being selfed in winter nursery:

CML323:N(LH213)	Ki21:N(PHK56)	CML380:S(LH200)
CML323:N(LH216)	NEI9008:N(DK_HBA1)	CML380:S(PHHB9)
CML384:N(PHK56)	NEI9008:N(PHK56)	CML442:S(PHHB4)
CML395:N(PHK56)	F45:N(LH213)	CML442:S(PHP38)
CML422:N(LH213)	CML78:S(LH200)	CML486:S(PHP38)
CML422:N(LH216)	CML78:S(PHMK0)	CL-02450:S(LH200)
CML449:N(PHK56)	CML274:S(PHEW7)	CL-02450:S(PHP38)
CML451:N(LH212Ht)	CML274:S(PHP38)	D940Y:S(PHHB9)
CML451:N(LH213)	CML343:S(PHEW7)	KO679Y:S(LH200)

Several other promising breeding crosses will be selfed in the 2019 summer nursery, including:

MonsantoT1:S(GEMS-0227)*	Population 24 (IST)C2:S(PHP38)
MonsantoT2:S(GEMS-0227)*	ICA V-156:S(PHP38)
GEMS-0293/GEMS-0281	Population 32 (IST) C2:N(LH213)
FL 4BT7:N(LH216)	GEMN-0124/GEMN-0287
(Pool17HS208+Pool33-128):N(LH213)	Population 33 (IST) C2:N(LH213)
((NC258/NC296)/NC300):N(DK_HBA1)	JAL167B:S(PHP38)

*S1 families produced by GEM-Ames in 2016 and observed in Raleigh in 2018

The Raleigh-GEM program has traditionally focused on 50% exotic breeding crosses and left the 25% exotic breeding crosses to the Ames program, but there are many exotic sources that cannot be effectively used at the 50% level even in Raleigh and so we are expanding our focus to look at 25% exotic breeding crosses for these accessions.

Allelic Diversity:

- There were 50 summer nursery rows dedicated to the development of BC₁S for the Allelic Diversity project.

- Five BC₁ families were completed this summer in Raleigh, and five BC₁ families and two F₁s were also completed in the 2017 winter nursery.

Breeding crosses produced in summer 2018:

Pedigree	Notes
GTO69:S(PHP38)GEMS-0227	GTO69 = Celaya
GTO84:S(PHP38)GEMS-0227	GTO84 = Celaya
JAL167B:S(PHP38)GEMS-0227	JAL167B = Celaya
ICA V-156:S(PHP38)GEMS-0227	ICA V-156 = Tuxpeno synthetic
(KO679Y/CML287):S(GEMS-0227)	KO679Y = South African inbred
BR31381:S(PHP38)GEMS-0227	BR31381 = Tuxpeno-1
CML343:S(GEMS-0032)GEMS-0227	
(GEMS-0243/GEMS-0032)/GEMS-0227	
(CML277/CML341-1-Sib/01-2-#):S(GEMS-0227)	
GTO69:S(PHP38)GEMS-0220	GTO69 = Celaya
GTO84:S(PHP38)GEMS-0220	GTO84 = Celaya
JAL167B:S(PHP38)GEMS-0220	JAL167B = Celaya
ICA V-156:S(PHP38)GEMS-0220	ICA V-156 = Tuxpeno synthetic
BR31381:S(PHP38)GEMS-0220	BR31381 = Tuxpeno-1
(KO679Y/CML287):S(GEMS-0220)	KO679Y = South African inbred
CML343:S(GEMS-0032)GEMS-0220	
(GEMS-0243/GEMS-0032)/GEMS-0220	
(CML373/NC320-01-03-#):S(GEMS-0220)	
(CML277/CML341-1-Sib/01-2-#):S(GEMS-0220)	
GTO84:S(PHP38)PHHB9	GTO84 = Celaya
VEN 981:N40x(GEMN-0097)	VEN 981 = Canilla
Cubano Amarillo-UCA 12:N40x(GEMN-0097)	Ucayali 12 = Cubano amarillo duro
VAL 343:N40x(GEMN-0097)	Valle 343 = Comun/Amarillo precoz
CML313:N(GEMN-0048)GEMN-0097	
CML395:N(GEMN-0048)GEMN-0097	
CML341:S42-B-004/GEMS-0220	GEM unreleased x GEM
CML341:S42-B-004/GEMS-0115	GEM unreleased x GEM
CML341:S42-B-010/GEMS-0115	GEM unreleased x GEM
CML341:S42-B-010/GEMS-0227	GEM unreleased x GEM
CML343:S(NS701)-B-014/GEMS-0220	GEM unreleased x GEM
CML343:S(NS701)-B-014/GEMS-0115	GEM unreleased x GEM
CML343:S(NS701)-B-019/GEMS-0115	GEM unreleased x GEM
CML343:S(NS701)-B-019/GEMS-0220	GEM unreleased x GEM
CML343:S42-001-009/GEMS-0227	GEM unreleased x GEM
CML343:S42-001-009/GEMS-0115	GEM unreleased x GEM
CML343:S42-003-002/GEMS-0227	GEM unreleased x GEM
CML343:S42-003-002/GEMS-0115	GEM unreleased x GEM
DKB844:S51-036-002/GEMS-0147	GEM unreleased x GEM

DKB844:S51-036-002/GEMS-0227	GEM unreleased x GEM
BR106:G39-012-002/GEMS-0147	GEM unreleased x GEM
BR106:G39-012-002/GEMS-0115	GEM unreleased x GEM
BR106:G39-012-002/GEMS-0072	GEM unreleased x GEM
GEMS-0293/GEMS-0072	GEM x GEM
GEMS-0293/GEMS-0115	GEM x GEM
GEMS-0293/GEMS-0147	GEM x GEM
GEMS-0255/GEMS-0220	GEM x GEM
GEMS-0255/GEMS-0147	GEM x GEM
GEMS-0255/GEMS-0115	GEM x GEM
GEMS-0255/GEMS-0072	GEM x GEM

Germplasm to be crossed in winter 2018:

Pedigree	Pattern to be crossed	Notes
D940Y	SSS	South African inbred
KO679Y	SSS	South African inbred
CL-02450	SSS	CIMMYT inbred
CML373	SSS	CIMMYT inbred
CML380	SSS	CIMMYT inbred
CML494	SSS	CIMMYT inbred
La Posta Seq C7 F71-1-1-1-2-B-B-B	SSS	CIMMYT inbred
AC454	NSSS	Inbred of unknown origin
CML323	NSSS	CIMMYT inbred
CML384	NSSS	CIMMYT inbred
CML449	NSSS	CIMMYT inbred
CML451	NSSS	CIMMYT inbred
NEI9008	NSSS	Inbred from Nakon Suwan (Thailand)
GTO69:S(PHP38)	SSS	Cross to PHHB4, PHHB9, and PHMK0
GTO84:S(PHP38)	SSS	Cross to PHHB4 and PHMK0
CHS462:S(PHP38)	SSS	Cross to PHHB4, PHHB9, and PHMK0; CHS462 = Tuxpeno
SLP146:S(PHP38)	SSS	Cross to PHHB4, PHHB9, and PHMK0; SLP146 = Tuxpeno
CML343:S(GEMS-0032)	SSS	Cross to PHHB4, PHHB9, and PHMK0
GEMS-0243/GEMS-0032	SSS	Cross to PHHB4, PHHB9, and PHMK0
ECU 904:N(GEMN-0048)	NSSS	Cross to LH213, PHBE2; ECU904 = Cubano Amarillo Duro
BarbGP2:N(GEMN-0048)	NSSS	Cross to LH213, PHBE2; BarbGP2 = Coastal Tropical Flint

SSS ex-PVPs to be used in crosses include DK_84QAB1, DK_WQCD10, HC33, LH235, LH236, LH242, PHAG6, PHEW7, PHHB4, and PHMK0. nSSS ex-PVPs to be used in crosses include DK_MM402A, LH213, LH283, LH284, and PHBE2.

Summaries of the GEM-Raleigh Recommended Lines for 2019

GEM code	Pedigree	Days to ANT	GDU to ANT	Days to Silk	GDU to Silk	Plant Height	Ear Height	Grain color	Grain type	Cob color
GEMN-0310	(GEMN-0104/GEMN-0097)-070-003	56		57		230	80	Y	SD/SF	White
GEMS-0311	BR106:S42-063-002	59		62		220	95	Y	D	Red
Maturity check	LH195	60		60		155	60			
Maturity check	PHHB9	56		55		170	55			
Maturity check	PHMK0	59		59		170	65			
Maturity check	LH212Ht	56		56		185	70			
Maturity check	PHN46	56		56		175	80			

GEM code	Pedigree	Days to ANT	GDU to ANT	Days to Silk	GDU to Silk	Plant Height	Ear Height	Grain color	Grain type
GEMS-0312	PASCO14:S11a-128-003	63	1585	64	1616	235	95	Y	D
Maturity check	B73	60	1495	62	1534	190	75		
Maturity check	PHMK0	63	1585	66	1675	180	60		
Maturity check	LH212Ht	64	1616	64	1616				
Maturity check	PHR03	66	1675	64	1616				



GEM Releases

Table 14. 2019 Ames-GEM Germplasm Releases (7)

GEM Code	Pedigree	Race	Country	Type	Het. Group
GEMS-0303	(GEMS-0162/GEMS-0227)-040-002-001	Argentino / Tropical Inbred	Cuba/Thailand	25% Exotic	SS
GEMS-0304	(GEMS-0162/GEMS-0227)-046-001-001	Argentino / Tropical Inbred	Cuba/Thailand	25% Exotic	SS
GEMS-0305	(GEMS-0227/PHP38)-018-001-001	Tropical Inbred	Thailand	12.5% Exotic	SS
GEMS-0306	((LH195/KO679Y)/GEMS-0227)-010-001-002	Tropical Inbred /Tropical Inbred	South Africa /Thailand	37.5% Exotic	SS
GEMS-0307	((PHB47/CML373)/GEMS-0162)-SIB-053-002	Tropical Inbred /Argentino	Mexico / Cuba	37.5% Exotic	SS
GEMS-0308	((PHB47/CML373)/GEMS-0162)-SIB-086-001	Tropical Inbred /Argentino	Mexico / Cuba	37.5% Exotic	SS
GEMN-0309	ATL100:N(LH82)(GEMN-0097)-090-001	Tropical Hybrid	Brazil	25% Exotic	NS

Table 15. 2019 GEM-Ames Released Lines – Ear & Grain Traits

GEM Code	Poll GDU	Cob Color	Grain color	Grain Texture
GEMS-0303	1407	White	Yellow	Semi-Dent
GEMS-0304	1355	Seg R/W	Yellow	Semi-Dent
GEMS-0305	1355	White	Yellow	Semi-Dent
GEMS-0306	1391	Pink	Yellow	Dent
GEMS-0307	1427	White	Yellow	Semi-Dent
GEMS-0308	1375	Red	Yellow	Semi-Dent
GEMN-0309	1334	Red	Yellow	Semi-Flint

Table 16. 2019 GEM-Ames Released Lines – Topcross RM and Ear Height

GEM Code	Pedigree	Average	
		Estimated RM	Ear Height (cm)
GEMS-0303	(GEMS-0162/GEMS-0227)-040-002-001	110	114
GEMS-0304	(GEMS-0162/GEMS-0227)-046-001-001	110	110
GEMS-0305	(GEMS-0227/PHP38)-018-001-001	109	115
GEMS-0306	((LH195/KO679Y)/GEMS-0227)-010-001-002	110	125
GEMS-0307	((PHB47/CML373)/GEMS-0162)-SIB-053-002	115	123
GEMS-0308	((PHB47/CML373)/GEMS-0162)-SIB-086-001	115	120
GEMN-0309	ATL100:N(LH82)(GEMN-0097)-090-001	110	120
	Hybrid Checks		
	MBS2655/MBS9508	~109-110	121
	MBS3520/MBS8814	~111	121
	Pioneer P0987	~109	122
	Pioneer P1151	~111	108
	31D58	~114	130

Table 17. 2019 GEM Ames Released Lines - Disease and Nursery Observations

GEM Code	Pedigree	Shed GDU	Silk GDU	Ames		Nurs Obs		Disease			Ear Notes		
				PHT	EHT	Early Rtg	Field Score	GLS	NLB	SLB	Cob Color	K Color	K Rows
GEMS-0303	(GEMS-0162/GEMS-0227)-040-002-001	1407	1407	208	115	6	7	NT	6	NT	W	Y	16
GEMS-0304	(GEMS-0162/GEMS-0227)-046-001-001	1355	1355	165	107	7	7	NT	NT	NT	R/W	Y	16
GEMS-0305	(GEMS-0227/PHP38)-018-001-001	1355	1355	210	105	7	6	5	NT	NT	W	Y	16
GEMS-0306	((LH195/KO679Y)/GEMS-0227)-010-001-002	1391	1391	195	97	6	7	7	7	6	R/W	Y	16
GEMS-0307	((PHB47/CML373)/GEMS-0162)-SIB-053-002	1427	1427	196	108	6	6	8	7	7	W	Y	16
GEMS-0308	((PHB47/CML373)/GEMS-0162)-SIB-086-001	1375	1391	200	107	6	7	8	7	4	R	Y	14
GEMN-0309	ATL100:N(LH82)(GEMN-0097)-090-001	1334	1334	198	113	6	5	7	5	NT	R	Y	16
B73	Check	1355	1334	195	106	8	4	6	2	4			
LH195	Check	1451	1446	175	80	8	5	NT	NT	NT			
Mo17	Check	1380	1433	198	110	8	7	7	4	8			
Oh43	Check	1207	1303	183	68	7	3	NT	NT	NT			

Nursery Rating Scale: 9 = Best, 1 = Worst

Disease Rating Scale: GLS 9 = Resistant, 1 = Susceptable
NLB 9 = Resistant, 1 = Susceptable
SLB 9 = Resistant, 1 = Susceptable

Summary of Performance Data: GEMS-0303

Year	# Reps	Exp	Ent	Pedigree	Yield (bu/a)	Y/M	% MST	% Stalk Lodging	% Root Lodging	Test Weight	% Green Snap	Plant Height	Ear Height
2018	8	1864204	35	(GEMS-0162/GEMS-0227)-040-002/MBS5562	197.6	11.6	17.0	1.3	0.0	57.8	1.4	255	114
				% Check Mean	92.1%	98.3%	93.4%	14.4%	0.0%	99.8%	5.3%	94.8%	95.8%
2018	8	1864209	36	(GEMS-0162/GEMS-0227)-040-002/MBS8731	199.1	11.0	18.4	3.7	0.5	56.1	4.3	258	115
				% Check Mean	99.9%	96.5%	104.0%	75.5%	23.8%	98.4%	20.4%	96.6%	95.8%
2016	6	1664108	125	(GEMS-0162/GEMS-0227)-040-002/DAS-nSS	189.8	9.9	19.4			59.2			
				% Check Mean	90.0%	95.5%	93.2%			104.8%			

Nursery Notes: Good stalks and excellent roots; Good grain quality and test weight
 Flower 1 to 2 days later than B73 and 2 days earlier than LH195

GEMS-0162 is derived from CUBA117, an Argentino line from Cuba
 GEMS-0227 is derived from NEI9004, a tropical inbred from Thailand



Summary of Performance Data: GEMS-0304

Year	# Reps	Exp	Ent	Pedigree	Yield (bu/a)	Y/M	% MST	% Stalk Lodging	% Root Lodging	Test Weight	% Green Snap	Plant Height	Ear Height
2018	8	1864204	42	(GEMS-0162/GEMS-0227)-046-001/MBS5562	204.2	12.1	16.9	6.6	0.0	57.9	0	269	113
				% Check Mean	95.2%	102.5%	92.9%	73.3%	0.0%	100.0%	0.0%	100.0%	95.0%
2018	8	1864209	42	(GEMS-0162/GEMS-0227)-046-001/MBS8731	197.3	11.0	18.0	5.3	0.5	56.8	12.9	260	108
				% Check Mean	99.0%	96.5%	101.7%	108.2%	23.8%	99.6%	61.1%	97.4%	90.0%
2016	6	1664108	135	(GEMS-0162/GEMS-0227)-046-001/DAS-nSS	201.8	10.4	19.6			59.4			
				% Check Mean	95.7%	100.2%	94.4%			105.2%			

Nursery Notes: Good stalks and roots; Low green snap potential
Very good grain quality and test weight; Good late intactness
Flowers the same day as B73

GEMS-0162 is derived from CUBA117, an Argentino line from Cuba
GEMS-0227 is derived from NEI9004, a tropical inbred from Thailand



Summary of Performance Data: GEMS-0305

Year	# Reps	Exp	Ent	Pedigree	Yield (bu/a)	Y/M	% MST	% Stalk Lodging	% Root Lodging	Test Weight	% Green Snap	Plant Height	Ear Height
2018	8	1864204	7	(GEMS-0227/PHP38)-018-001/MBS5562	209.2	12.4	16.9	6.7	0.0	57.4	0.0	265	109
				% Check Mean	97.5%	105.1%	92.9%	74.4%	0.0%	99.1%	0.0%	98.5%	91.6%
2018	8	1864208	27	(GEMS-0227/PHP38)-018-001/MBS8731	209.9	11.9	17.7	7.7	0.0	56.1	2.9	268	122
				% Check Mean	103.1%	104.4%	99.4%	97.5%	0.0%	97.9%	9.6%	100.4%	100.8%
2017	6	1714110	30	(GEMS-0227/PHP38)-018-001/MBS8731	232.9	12.6	18.9	7.0	2.5	55.8		288	112
				% Check Mean	105.6%	105.9%	100.5%	145.8%	36.8%	98.8%		99.3%	100.0%

Nursery Notes: Average stalks and good roots
Good grain quality and test weight
Flowers the same day as B73

GEMS-0227 is derived from NEI9004, a tropical inbred from Thailand

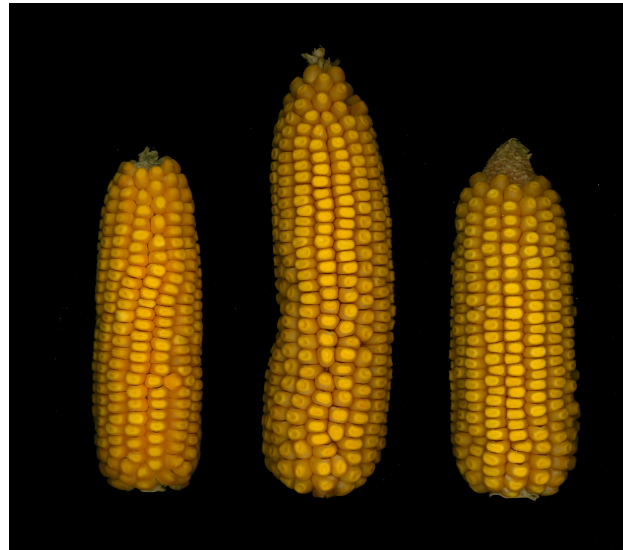


Summary of Performance Data: GEMS-0306

Year	# Reps	Exp	Ent	Pedigree	Yield (bu/a)	Y/M	% MST	% Stalk Lodging	% Root Lodging	Test Weight	% Green Snap	Plant Height	Ear Height
2018	8	1864206	3	((LH195/KO679Y)/GEMS-0227)-010-001/MBS5562	201.6	11.5	17.6	7.1	5.9	57.1	0	278	131
				% Check Mean	95.6%	99.1%	95.7%	165.1%	134.1%	99.7%	0.0%	104.1%	107.4%
2018	8	1864213	23	((LH195/KO679Y)/GEMS-0227)-010-001/MBS9451	194.0	10.6	18.6	3.7	3.5	54.5	0	280	130
				% Check Mean	95.3%	95.5%	98.9%	80.4%	64.8%	96.5%	0.0%	103.7%	107.4%
2017	6	1754101	13	((LH195/KO679Y)/GEMS-0227)-010-001/MBS9451	187.7	10.1	18.8	2.9	0.0	57.0		295	117
				% Check Mean	91.2%	89.4%	101.6%	96.7%	0.0%	98.3%		102.8%	110.4%

Nursery Notes: Average stalks and roots; Very low green snap potential
 Good foliar disease resistance; Good grain quality and test weight
 Flowers 2 days later than B73 and 2 days earlier than LH195

KO679Y is a tropical inbred, a Teko Yellow line from South Africa
 GEMS-0227 is derived from NEI9004, a tropical inbred from Thailand



Summary of Performance Data: GEMS-0307

Year	# Reps	Exp	Ent	Pedigree	Yield (bu/a)	Y/M	% MST	% Stalk Lodging	% Root Lodging	Test Weight	% Green Snap	Plant Height	Ear Height
2018	7	1864207	7	((PHB47/CML373)/GEMS-0162)-SIB-053-002/MBS8731	193.0	10.1	19.3	0.6	0.0	57.0	71.4	267	120
				% Check Mean	96.5%	88.6%	109.0%	6.1%	0.0%	99.8%	373.8%	99.3%	96.0%
2018	7	1864211	24	((PHB47/CML373)/GEMS-0162)-SIB-053-002/MBS9451	186.6	9.3	20.3	3.9	9.3	55.7	0.0	280	127
				% Check Mean	94.9%	90.3%	105.7%	70.9%	372.0%	97.2%	0.0%	104.5%	103.3%
2017	6	1714104	42	((PHB47/CML373)/GEMS-0162)-SIB-053-002/MBS8731	206.2	10.1	21.0	0.7	2.0	57.3		283	113
				% Check Mean	95.1%	88.6%	108.2%	13.0%	90.9%	99.5%		98.3%	99.1%

Nursery Notes: Good stalks and roots; Good grain quality and test weight
Low green snap potential; Very good foliar leaf disease resistance
Flowers 3 days later than B73

CML373 is a CIMMYT tropical inbred from Mexico
GEMS-0162 is derived from CUBA117, an Argentino line from Cuba



Summary of Performance Data: GEMS-0308

Year	# Reps	Exp	Ent	Pedigree	Yield (bu/a)	Y/M	% MST	% Stalk Lodging	% Root Lodging	Test Weight	% Green Snap	Plant Height	Ear Height
2018	7	1864207	10	((PHB47/CML373)/GEMS-0162)-SIB-086-001/MBS8731	187.0	9.7	19.5	1.3	2.6	56.3	45.7	273	118
				% Check Mean	93.5%	85.1%	110.2%	13.1%	68.4%	98.6%	239.3%	101.5%	94.4%
2018	7	1864211	27	((PHB47/CML373)/GEMS-0162)-SIB-086-001/MBS9451	190.2	9.6	20.2	0.9	5.3	56.8	4.2	267	123
				% Check Mean	96.7%	93.2%	105.2%	16.4%	212.0%	99.1%	23.2%	99.6%	100.0%
2017	6	1714104	64	((PHB47/CML373)/GEMS-0162)-SIB-086-001/MBS8731	198.6	9.9	20.4	2.9	0.0	57.6		302	123
				% Check Mean	91.6%	86.8%	105.2%	53.7%	0.0%	100.0%		104.9%	107.9%

Nursery Notes: Excellent stalks and good roots; Good grain quality and test weight
 Good foliar leaf disease resistance
 Flowers 1 day later than B73

CML373 is a CIMMYT tropical inbred from Mexico
 GEMS-0162 is derived from CUBA117, an Argentino line from Cuba



Summary of Performance Data: GEMN-0309

Year	# Reps	Exp	Ent	Pedigree	Yield (bu/a)	Y/M	% MST	% Stalk Lodging	% Root Lodging	Test Weight	% Green Snap	Plant Height	Ear Height
2018	8	1864201	22	ATL100:N(LH82)(GEMN-0097)-090-001/MBS2655	193.5	10.8	17.9	13.0	0.4	56.6	5.6	255	117
				% Check Mean	95.4%	99.1%	95.7%	139.8%	9.5%	98.1%	41.2%	98.1%	100.0%
2018	8	1864203	15	ATL100:N(LH82)(GEMN-0097)-090-001/MBS3520	211.2	12.0	17.9	5.8	7.9	55.7	0.0	268	124
				% Check Mean	104.9%	109.1%	96.2%	58.6%	97.5%	97.5%	0.0%	96.8%	99.2%
2017	6	1713102	7	ATL100:N(LH82)(GEMN-0097)-090-001/MBS3520	212.0	11.6	18.4	3.5	0.5	55.4		287	113
				% Check Mean	96.5%	99.1%	95.8%	106.1%	125.0%	97.5%		102.9%	103.7%

Nursery Notes: Average stalks and good roots; Low green snap potential
 Good GLS resistance
 Flowers 1 day earlier than B73

ATL100 is a tropical Brazilian hybrid
 GEMN-0097 is derived from Florida synthetic FS8B



Summary of Performance Data: (GEMS-0227/(Mp494/GEMS-0002)-001-002-001-001)-SIB-138-001

Year	# Reps	Exp	Ent	Pedigree	Yield (bu/a)	Y/M	% MST	% Stalk Lodging	% Root Lodging	Test Weight	% Green Snap	Plant Height	Ear Height
2018	7	1864207	55	(GEMS-0227/(Mp494/GEMS-0002)-001-002-001-001)-SIB-138-001/MBS8731	196.4	10.9	18.4	6.9	2.9	54.8	6	273	122
				% Check Mean	98.2%	95.6%	104.0%	69.7%	76.3%	96.0%	29.8%	101.5%	97.6%
2018	8	1864213	9	(GEMS-0227/(Mp494/GEMS-0002)-001-002-001-001)-SIB-138-001/MBS9451	210.4	12.2	17.4	6.8	5.4	53.2	4.3	270	115
				% Check Mean	103.4%	109.9%	92.6%	147.8%	100.0%	94.2%	15.4%	100.0%	95.0%
2017	6	1714111	51	(GEMS-0227/(Mp494/GEMS-0002)-001-002-001-001)-SIB-138-001/MBS9451	183.2	10.2	18.2	9.9	1.0	53.2		277	103
				% Check Mean	90.6%	97.1%	91.9%	215.2%	125.0%	94.0%		98.6%	97.2%

Nursery Notes: Mp494 selected for low aflatoxin, line will be reviewed in aflatoxin screening trials in 2019
 Good grain quality, moderate test weight in hybrids; Taller line with moderate ear height
 Flowers 1 day later than B73



Summary of Performance Data: (GEMS-0227/(Mp717/GEMS-0002)-001-001-001-001)-SIB-025-001

Year	# Reps	Exp	Ent	Pedigree	Yield (bu/a)	Y/M	% MST	% Stalk Lodging	% Root Lodging	Test Weight	% Green Snap	Plant Height	Ear Height
2018	7	1864207	24	(GEMS-0227/(Mp717/GEMS-0002)-001-001-001-001)-SIB-025-001/MBS8731	196.0	11.1	17.9	3.2	1.4	58.3	51	272	118
				% Check Mean	98.0%	97.4%	101.1%	32.3%	36.8%	102.1%	269.1%	101.1%	94.4%
2018	8	1864213	10	(GEMS-0227/(Mp717/GEMS-0002)-001-001-001-001)-SIB-025-001/MBS9451	194.6	11.4	17.5	4.9	5.5	56.7	17.0	280	127
				% Check Mean	95.6%	102.7%	93.1%	106.5%	101.9%	100.4%	60.7%	103.7%	105.0%
2017	6	1714111	74	(GEMS-0227/(Mp717/GEMS-0002)-001-001-001-001)-SIB-025-001/MBS9451	178.7	10.1	17.9	1.8	2.5	57.0		285	113
				% Check Mean	88.3%	96.2%	90.4%	39.1%	312.5%	100.7%		101.4%	106.6%

Nursery Notes:

Mp717 selected for low aflatoxin, line will be reviewed in aflatoxin screening trials in 2019

Good grain quality with excellent test weight in hybrids; Taller line with moderate ear height

Flowers 1 day later than B73



Summary of Performance Data: ((PHB47/CML373)/GEMS-0162)-SIB-053-001

Year	# Reps	Exp	Ent	Pedigree	Yield (bu/a)	Y/M	% MST	% Stalk Lodging	% Root Lodging	Test Weight	% Green Snap	Plant Height	Ear Height
2018	7	1864207	6	((PHB47/CML373)/GEMS-0162)-SIB-053-001/MBS8731	181.9	9.3	19.8	3.0	0.5	55.8	16.7	268	123
				% Check Mean	91.0%	81.6%	111.9%	30.3%	13.2%	97.7%	89.8%	99.6%	98.4%
2018	7	1864211	23	((PHB47/CML373)/GEMS-0162)-SIB-053-001/MBS9451	183.1	9.5	19.4	12.3	11.0	56.6	0.0	260	120
				% Check Mean	93.1%	92.2%	101.0%	223.6%	440.0%	98.8%	0.0%	97.0%	97.6%
2017	6	1714104	41	((PHB47/CML373)/GEMS-0162)-SIB-053-001/MBS8731	197.5	10.2	19.9	3.3	6.1	56.1		283	120
				% Check Mean	91.1%	89.5%	102.6%	61.1%	277.3%	97.4%		98.3%	105.3%

Nursery Notes: White grain of good quality and test weight; Segregating cob color
Flowers 1-2 days later than B73



Racial Background of GEM Releases

Race	Ames Releases	NC Releases	Other Releases	Total Releases
Alazan	1	0	0	1
Argentino	6	0	0	6
Argentino/Tropical Inbred	2	0	0	2
Camelia	7	0	1	8
Canilla	0	0	0	0
Cateto	0	11	0	11
Cateto Sulino	4	0	0	4
Composite (Suwan)	10	1	0	11
Composite (Tuxpeño)	1	0	0	1
Corn Belt Dent	1	0	0	1
Criollo	1	1	0	2
Criollo/Argentino (CUBA164)	15	1	2	18
Criollo/Tuson (CUBA173)	1	0	0	1
Cristalino Colorado	16	0	2	18
Cuban yellow	7	3	0	10
Dent. Blanco Rugoso	3	0	3	6
Dentado Blanco	5	0	0	5
Dente Amarelo	8	3	1	12
Dente Branco	5	0	0	5
Early Caribbean	1	0	0	1
Hybrid Blanco	0	0	0	0
Hybrid-tropical	25	75	4	104
Mixed	12	3	4	19
GEM Derived	11	5	0	16
Multiple Borer Composite	1	0	0	1
Semidentado Riograndense	2	0	0	2
Southern Dent	0	0	0	0
St. Croix	1	1	1	3
Suwan	13	2	0	15
Tropical Hybrid	1	0	0	1
Tropical Inbred/Argentino	2	0	0	2
Tropical Inbred/Tropical Inbred	1	0	0	1
Tropical Line	5	5	0	10
Tusón	10	2	1	13
Tusón/Canilla	1	0	0	1
Tuxpeño	3	9	0	12
Tuxpeño/Olotillo	2	0	0	2
Unclassified	1	0	0	1
Totals	185	122	19	326

GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site Released	Year Released
1	GEMS-001(PI503806xB94///B94)	GEMS-0001	Alazan	Peru	Ames	2001
2	GEMS-002 (FS8A(S):S09-43-2)	GEMS-0002	Mixed	USA	Ohio St.	2003
3	BR52051(SE32):S17-B-023-001-B-B	GEMS-0003	Dente Amarelo	Brazil	NC	2003
4	DK212T:S11-B-013-002-B-B	GEMS-0004	Hybrid Tropical	Thailand	NC	2003
5	DK212T:S11-B-015-001-B-B	GEMS-0005	Hybrid Tropical	Thailand	NC	2003
6	DK212T:S11-B-017-001-B-B	GEMS-0006	Hybrid Tropical	Thailand	NC	2003
7	DK212T:S11-B-018-001-B-B	GEMS-0007	Hybrid Tropical	Thailand	NC	2003
8	DK212T:S11-B-038-001-B-B	GEMS-0008	Hybrid Tropical	Thailand	NC	2003
9	DK212T:S11-B-040-001-B-B	GEMS-0009	Hybrid Tropical	Thailand	NC	2003
10	DK212T:S11-B-041-002-B-B	GEMS-0010	Hybrid Tropical	Thailand	NC	2003
11	DK212T:S11-B-045-002-B-B	GEMS-0011	Hybrid Tropical	Thailand	NC	2003
12	DK888:S11-B-003-001-B-B	GEMS-0012	Hybrid Tropical	Thailand	NC	2003
13	DK888:S11-B-004-004-B-B	GEMS-0013	Hybrid Tropical	Thailand	NC	2003
14	DK888:S11-B-010-001-B-B	GEMS-0014	Hybrid Tropical	Thailand	NC	2003
15	DK888:S11-B-014-001-B-B	GEMS-0015	Hybrid Tropical	Thailand	NC	2003
16	DK888:S11-B-015-003-B-B	GEMS-0016	Hybrid Tropical	Thailand	NC	2003
17	DK888:S11-B-025-001-B-B	GEMS-0017	Hybrid Tropical	Thailand	NC	2003
18	DK888:S11-B-026-002-B-B	GEMS-0018	Hybrid Tropical	Thailand	NC	2003
19	DK888:S11-B-029-001-B-B	GEMS-0019	Hybrid Tropical	Thailand	NC	2003
20	DK888:S11-B-033-001-B-B	GEMS-0020	Hybrid Tropical	Thailand	NC	2003
21	DK888:S11-B-035-002-B-B	GEMS-0021	Hybrid Tropical	Thailand	NC	2003
22	DK888:S11-B-035-003-B-B	GEMS-0022	Hybrid Tropical	Thailand	NC	2003
23	DK888:S11-B-039-002-B-B	GEMS-0023	Hybrid Tropical	Thailand	NC	2003
24	DKB830:S11-B-045-001-B-B	GEMS-0024	Hybrid Tropical	Mexico	NC	2003
25	DKXL370:S11-B-001-002-B-B	GEMS-0025	Hybrid Tropical	Brazil	NC	2003
26	DKXL370:S11-B-025-001-B-B	GEMS-0027	Hybrid Tropical	Brazil	NC	2003
27	DKXL370:S11-B-025-002-B-B	GEMS-0028	Hybrid Tropical	Brazil	NC	2003
28	DKXL370:S11-B-028-001-B-B	GEMS-0029	Hybrid Tropical	Brazil	NC	2003
29	DKXL380:S11-B-004-003-B-B	GEMS-0030	Hybrid Tropical	Brazil	NC	2003
30	DKXL380:S11-B-028-001-B-B	GEMS-0031	Hybrid Tropical	Brazil	NC	2003
31	DKXL380:S11-B-029-001-B-B	GEMS-0032	Hybrid Tropical	Brazil	NC	2003
32	BR51403(PE001):N16-B-044-B	GEMN-0033	Cateto	Brazil	NC	2003
33	BR51403(PE001):N16-B-172-B	GEMN-0035	Cateto	Brazil	NC	2003
34	BR51403(PE001):N16-B-176-B	GEMN-0036	Cateto	Brazil	NC	2003
35	BR51403(PE001):N16-B-181-B	GEMN-0037	Cateto	Brazil	NC	2003

GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site Released	Year Released
36	BR51403(PE001):N16-B-239-B	GEMN-0039	Cateto	Brazil	NC	2003
37	BR51403(PE001):N16-B-431-B	GEMN-0040	Cateto	Brazil	NC	2003
38	BR51403(PE001):N16-B-521-B	GEMN-0041	Cateto	Brazil	NC	2003
39	BR51403(PE001):N16-B-705-B	GEMN-0042	Cateto	Brazil	NC	2003
40	BR51403(PE001):N16-B-857-B	GEMN-0043	Cateto	Brazil	NC	2003
41	CH05015:N12-20-1-B-B	GEMN-0044	Camelia	Chile	Ames	2003
42	CH05015:N12-140-1-B-B	GEMN-0045	Camelia	Chile	Ames	2003
43	CH05015:N15-8-1-B-B	GEMN-0046	Camelia	Chile	Ames	2003
44	UR13085:N0215-014-001	GEMN-0047	Cateto Sulino	Uruguay	Ames	2003
45	DKXL370:N11a20-31-1-B-B	GEMN-0048	Hybrid Tropical	Brazil	Ames	2003
46	DKB844:S1601-512-1-B	GEMS-0049	Hybrid Tropical	Mexico	Ames	2003
47	DKB844:S1601-517-1-B	GEMS-0050	Hybrid Tropical	Mexico	Ames	2003
48	CUBA164:S2008a-83-1-B	GEMS-0051	Mixed (Creole)	Cuba	Ames	2003
49	CUBA164:S2008a-326-1-B	GEMS-0052	Mixed (Creole)	Cuba	Ames	2003
50	CUBA164:S15-192-2-B	GEMS-0053	Mixed (Creole)	Cuba	Ames	2003
51	AR16035:S02-450-1-B	GEMS-0054	Cristalino Colorado	Argentina	Ames	2003
52	AR16035:S02-443-1-B-B	GEMS-0055	Cristalino Colorado	Argentina	Ames	2003
53	FS8B(T):N1809-946-1-B	GEMN-0056	Mixed	USA	Ames	2003
54	AR01150:N04-545-1-B	GEMN-0057	Dent. Blanco Rugoso	Argentina	Ames	2003
55	AR01150:N04-696-1-B	GEMN-0058	Dent. Blanco Rugoso	Argentina	Ames	2003
56	SCRO1:N1310-398-1-B	GEMN-0059	St. Croix	St. Croix	Ames	2003
57	CHIS775:N1912-519-1-B-B	GEMN-0060	Tuxpeño	Mexico	Ames	2003
58	AR16026:S17-10-1-B-B	GEMS-0061	Cristalino Colorado	Argentina	Ames	2003
59	AR16026:S17-16-1-B-B	GEMS-0062	Cristalino Colorado	Argentina	Ames	2003
60	CUBA164:S1511b-325-001	GEMS-0063	Mixed (Creole)	Cuba	Ames	2003
61	CUBA164:S1511b-249-1-B-B	GEMS-0064	Mixed (Creole)	Cuba	Ames	2003
62	CUBA117:S1520-41-1-B-B	GEMS-0065	Argentino	Cuba	Ames	2003
63	CUBA117:S1520-52-1-B-B	GEMS-0066	Argentino	Cuba	Ames	2003
64	GUAT209:S13 x (H99ae x OH43ae)-4-4-2-1	GEMS-0067	Tusón	Guatemala	Truman St	2007
65	AR16026:S1704-153-001	GEMS-0068	Cristalino Colorado	Argentina	Ames	2003
66	AR16035:S19-161-001	GEMS-0069	Cristalino Colorado	Argentina	Ames	2003
67	CH05015:N12-183-001	GEMN-0070	Camelia	Chile	Ames	2003
68	CH05015:N15-003-001	GEMN-0071	Camelia	Chile	Ames	2003
69	CHIS775:S1911b-439-001	GEMS-0072	Tuxpeño	Mexico	Ames	2003
70	CUBA117:S15-372-001	GEMS-0073	Argentino	Cuba	Ames	2003

GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site Released	Year Released
71	CUBA164:S1517-163-001	GEMS-0074	Mixed (Creole)	Cuba	Ames	2003
72	CUBA164:S1517-241-002	GEMS-0075	Mixed (Creole)	Cuba	Ames	2003
73	DKB844:N11b-118-001	GEMN-0076	Hybrid Tropical	Mexico	Ames	2003
74	DKXL370:N11a20-604-001	GEMN-0077	Hybrid Tropical	Brazil	Ames	2003
75	FS8A(S):S09-362-001	GEMS-0078	Mixed	USA	Ames	2003
76	FS8B(S):S0316-802-001	GEMS-0079	Mixed	USA	Ames	2003
77	FS8B(S):S0316-814-001	GEMS-0080	Mixed	USA	Ames	2003
78	FS8B(T):N1802-382-001	GEMN-0081	Mixed	USA	Ames	2003
79	FS8B(T):N1802-525-001	GEMN-0082	Mixed	USA	Ames	2003
80	GUAT209:N1925-081-001	GEMN-0083	Tusón	Guatemala	Ames	2003
81	PASCO14:S0105-198-001	GEMS-0084	Cuban yellow	Peru	Ames	2003
82	UR01089:S0525-519-001	GEMS-0085	Cateto Sulino	Uruguay	Ames	2003
83	UR10001:S1813-257-001	GEMS-0086	Dente Branco	Uruguay	Ames	2003
84	AR03056:N09-024-001	GEMN-0087	Dentado Blanco	Argentina	Ames	2004
85	AR03056:N09-182-001	GEMN-0088	Dentado Blanco	Argentina	Ames	2004
86	AR03056:N09-191-001	GEMN-0089	Dentado Blanco	Argentina	Ames	2004
87	AR03056:N09-250-001	GEMN-0090	Dentado Blanco	Argentina	Ames	2004
88	CHIS740:S1411a-783-002	GEMS-0091	Tuxpeño/Olotillo	Mexico	Ames	2004
89	CUBA164:S2012-444-001	GEMS-0092	Mixed (Creole)	Cuba	Ames	2004
90	CUBA164:S2012-966-001	GEMS-0093	Mixed (Creole)	Cuba	Ames	2004
91	DKXL370:N11a20-199-002	GEMN-0094	Hybrid Tropical	Brazil	Ames	2004
92	DKXL370:N11a20-234-002	GEMN-0095	Hybrid Tropical	Brazil	Ames	2004
93	DKXL370:N11a20-322-001	GEMN-0096	Hybrid Tropical	Brazil	Ames	2004
94	FS8B(T):N11a-087-001	GEMN-0097	Mixed	USA	Ames	2004
95	FS8B(T):N11a-110-001	GEMN-0098	Mixed	USA	Ames	2004
96	FS8B(T):N11a-322-001	GEMN-0099	Mixed	USA	Ames	2004
97	UR11003:S0302-937-001	GEMS-0100	Dente Branco	Uruguay	Ames	2004
98	DK212T:S11b-007-B-B	GEMS-0101	Hybrid Tropical	Thailand	NC	2004
99	DK888:S11b-001-B	GEMS-0102	Hybrid Tropical	Thailand	NC	2004
100	DK888:N11(95)-B-027-010-B-B	GEMN-0103	Hybrid Tropical	Thailand	NC	2004
101	DK888:N11(95)-B-027-012-B-B	GEMN-0104	Hybrid Tropical	Thailand	NC	2004
102	DK888:N11(95)-B-027-015-B-B	GEMN-0105	Hybrid Tropical	Thailand	NC	2004
103	DK888:N11(95)-B-022-007-B-B	GEMN-0106	Hybrid Tropical	Thailand	NC	2004
104	DK888:N11(95)-B-022-012-B-B	GEMN-0107	Hybrid Tropical	Thailand	NC	2004
105	DK888:N11(95)-B-027-001-B-B	GEMN-0108	Hybrid Tropical	Thailand	NC	2004

GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site Released	Year Released
106	DKXL380:N11-B-015-003-B-B	GEMN-0109	Hybrid Tropical	Brazil	NC	2004
107	BARBGP2:N08a18-332-001	GEMN-0110	Tusón	Barbados	Ames	2005
108	CH05015:N1204-057-001	GEMN-0111	Camelia	Chile	Ames	2005
109	CH05015:N1502-086-001	GEMN-0112	Camelia	Chile	Ames	2005
110	CHIS775:S1911b-120-001	GEMS-0113	Tuxpeño	Mexico	Ames	2005
111	DK212T:N11a12-191-001	GEMN-0114	Hybrid Tropical	Thailand	Ames	2005
112	DKB844:S1601-073-001	GEMS-0115	Hybrid Tropical	Mexico	Ames	2005
113	DKB844:S1601-003-002	GEMS-0116	Hybrid Tropical	Mexico	Ames	2005
114	DREP150:N2011d-624-001	GEMN-0117	Mixed	Dom. Republic	Ames	2005
115	UR11003:S0302-1011-001	GEMS-0118	Dente Branco	Uruguay	Ames	2005
116	CHS775:N19-042-001-B	GEMN-0119	Tuxpeño	Mexico	NC	2005
117	CHS775:N19-042-003-B	GEMN-0120	Tuxpeño	Mexico	NC	2005
118	CHS775:N19-027-010-B	GEMN-0121	Tuxpeño	Mexico	NC	2005
119	CHS775:N19-093-002-B	GEMN-0122	Tuxpeño	Mexico	NC	2005
120	CHS775:N19-030-011-B	GEMN-0123	Tuxpeño	Mexico	NC	2005
121	DK212T:N11-B-003-001-B	GEMN-0124	Hybrid Tropical	Thailand	NC	2005
122	DK888:S11-B-029-001-B	GEMS-0125	Hybrid Tropical	Thailand	NC	2005
123	DK888:S11-B-029-006-B	GEMS-0126	Hybrid Tropical	Thailand	NC	2005
124	DK888:N11(95)-B-017-001-B	GEMN-0127	Hybrid Tropical	Thailand	NC	2005
125	DKXL370:N11-B-005-002-B	GEMN-0128	Hybrid Tropical	Brazil	NC	2005
126	DKXL370:N11-B-005-006-B	GEMN-0129	Hybrid Tropical	Brazil	NC	2005
127	DKXL370:N11-B-005-010-B	GEMN-0130	Hybrid Tropical	Brazil	NC	2005
128	DKXL370:N11-B-005-011-B	GEMN-0131	Hybrid Tropical	Brazil	NC	2005
129	DKXL370:N11-B-005-021-B	GEMN-0132	Hybrid Tropical	Brazil	NC	2005
130	DKXL370:N11-B-029-002-B	GEMN-0133	Hybrid Tropical	Brazil	NC	2005
131	DKXL380:N11-B-010-017-B	GEMN-0134	Hybrid Tropical	Brazil	NC	2005
132	DKXL380:N11-B-007-025-B	GEMN-0135	Hybrid Tropical	Brazil	NC	2005
133	DKXL380:N11-B-007-028-B	GEMN-0136	Hybrid Tropical	Brazil	NC	2005
134	SCR Gp3:N14-028-003-003-B	GEMN-0137	Tusón	St. Croix	NC	2005
135	AR17056:N2035-421-001	GEMN-0138	Cristalino Colorado	Argentina	Ames	2006
136	AR17056:N2035-473-001	GEMN-0139	Cristalino Colorado	Argentina	Ames	2006
137	BR51675:N0620-033-001	GEMN-0140	Dente Amarelo	Brazil	Ames	2006
138	BR51675:N0620-053-001	GEMN-0141	Dente Amarelo	Brazil	Ames	2006
139	BR52060:S0210-143-001	GEMS-0142	Dente Amarelo	Brazil	Ames	2006
140	BR52060:S0210-147-001	GEMS-0143	Dente Amarelo	Brazil	Ames	2006

GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site Released	Year Released
141	MDI022:N2120-284-001	GEMN-0144	Cuban yellow	Peru	Ames	2006
142	MDI022:N2120-333-001	GEMN-0145	Cuban yellow	Peru	Ames	2006
143	NEI9004:S2818-003-001	GEMS-0146	Inbred Tropical	Thailand	Ames	2006
144	NEI9004:S2818-025-001	GEMS-0147	Inbred Tropical	Thailand	Ames	2006
145	NEI9004:S2818-376-001	GEMS-0148	Inbred Tropical	Thailand	Ames	2006
146	UR05017:S0415-180-002	GEMS-0149	Semidentado Riograndense	Uruguay	Ames	2006
147	UR05017:S0415-187-001	GEMS-0150	Semidentado Riograndense	Uruguay	Ames	2006
148	CHIS775:N19-042-001-003-B-B-B-B	GEMN-0151	Tuxpeño	Mexico	NC	2006
149	DK212T:N11-B-016-005-B-B-B	GEMN-0152	Hybrid Tropical	Thailand	NC	2006
150	DKXL380:N11-B-007-027-B-B-B-B	GEMN-0153	Hybrid Tropical	Brazil	NC	2006
151	AR13026:N08b15-016	GEMN-0154	Cristalino Colorado	Argentina	Ames	2007
152	AR13026:N08b15-086	GEMN-0155	Cristalino Colorado	Argentina	Ames	2007
153	BR51721:N2012-098-002	GEMN-0156	Dente Amarelo	Brazil	Ames	2007
154	BR51721:N2012-164-002	GEMN-0157	Dente Amarelo	Brazil	Ames	2007
155	BR51721:N2012-397-001	GEMN-0158	Dente Amarelo	Brazil	Ames	2007
156	CASH:N1410-018-001	GEMN-0159	Corn Belt Dent	USA	Ames	2007
157	CUBA117:S1542-037-002	GEMS-0160	Argentino	Cuba	Ames	2007
158	CUBA117:S1542-057-001	GEMS-0161	Argentino	Cuba	Ames	2007
159	CUBA117:S1542-057-002	GEMS-0162	Argentino	Cuba	Ames	2007
160	CUBA164:S2012-456-001	GEMS-0163	Mixed (Creole)	Cuba	Ames	2007
161	DK212T:N11-B-003-022-B-B-B	GEMN-0164	Hybrid Tropical	Thailand	NC	2007
162	DK888:N11(95)-B-022-012-026-B-B	GEMN-0165	Hybrid Tropical	Thailand	NC	2007
163	DK888:N11(95)-B-027-001-008-B-B	GEMN-0166	Hybrid Tropical	Thailand	NC	2007
164	DK888:N11(95)-B-027-001-018-B-B	GEMN-0167	Hybrid Tropical	Thailand	NC	2007
165	DK888:N11(95)-B-027-001-019-B	GEMN-0168	Hybrid Tropical	Thailand	NC	2007
166	DK888:N11(95)-B-027-001-027-B	GEMN-0169	Hybrid Tropical	Thailand	NC	2007
167	DK888:N11(95)-B-027-001-030-B	GEMN-0170	Hybrid Tropical	Thailand	NC	2007
168	DK888:N11(95)-B-027-001-037-B	GEMN-0171	Hybrid Tropical	Thailand	NC	2007
169	DK888:N11(95)-B-027-001-040-B	GEMN-0172	Hybrid Tropical	Thailand	NC	2007
170	DK888:N11(95)-B-027-012-009-B	GEMN-0173	Hybrid Tropical	Thailand	NC	2007
171	AR17056:N2025-574-001	GEMN-0174	Cristalino Colorado	Argentina	Ames	2008
172	BVIR155:S2012-029-001	GEMS-0175	Tusón	British Virgin Is.	Ames	2008
173	CUBA164:S2008c-289-001	GEMS-0176	Mixed (Creole)	Cuba	Ames	2008
174	DK888:N11a08a-395-001	GEMN-0177	Hybrid Tropical	Thailand	Ames	2008
175	DK888:N11a08a-440-001	GEMN-0178	Hybrid Tropical	Thailand	Ames	2008

GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site Released	Year Released
176	FS8B(T):N11a08c-030-002	GEMN-0179	Mixed	USA	Ames	2008
177	GUAT209:S1308a-047-001	GEMS-0180	Tusón	Guatemala	Ames	2008
178	GUAT209:S1308a-068-001	GEMS-0181	Tusón	Guatemala	Ames	2008
179	GUAT209:S1308a-084-001	GEMS-0182	Tusón	Guatemala	Ames	2008
180	GUAT209:S1308a-104-001	GEMS-0183	Tusón	Guatemala	Ames	2008
181	GUAT209:S1308a-120-001	GEMS-0184	Tusón	Guatemala	Ames	2008
182	CUBA164:S2012-966-001-B wx	GEMS-0185	Mixed (Creole)	Cuba	Ames	2008
183	DKXL370:N11a20-036-002-B wx	GEMN-0186	Hybrid Tropical	Brazil	Ames	2008
184	ANTIG03:N1218-056-001	GEMN-0187	Criollo	Antigua	Ames	2009
185	DKXL212:S0912-012-001	GEMS-0188	Hybrid Tropical	Brazil	Ames	2009
186	DKXL212:S0912-117-001	GEMS-0189	Hybrid Tropical	Brazil	Ames	2009
187	PASCO14:N0424-078-001	GEMN-0190	Cuban yellow	Peru	Ames	2009
188	SCROGP3:N2017-003-001	GEMN-0191	Tusón	St. Croix	Ames	2009
189	SCROGP3:N2017-172-001	GEMN-0192	Tusón	St. Croix	Ames	2009
190	UR11002:N0308b-086-001	GEMN-0193	Dente Branco	Uruguay	Ames	2009
191	DK888:N11(95)-B-027-001-011-B	GEMN-0194	Hybrid Tropical	Thailand	NC	2009
192	DK888:N11(95)-B-027-001-015-B	GEMN-0195	Hybrid Tropical	Thailand	NC	2009
193	DK888:N11(95)-B-003-001-001-B	GEMN-0196	Hybrid Tropical	Thailand	NC	2009
194	DK888:N11(95)-002-021-008-B-B	GEMN-0197	Hybrid Tropical	Thailand	NC	2009
195	DK212T:N11-040-001-007	GEMN-0198	Hybrid Tropical	Thailand	NC	2009
196	AR16021:S0908a-039-001	GEMS-0199	Cristalino Colorado	Argentina	Ames	2010
197	BR105:S1612-008-001	GEMS-0200	Composite (Suwan)	Brazil	Ames	2010
198	BR105:S1612-057-001	GEMS-0201	Composite (Suwan)	Brazil	Ames	2010
199	BR105:S1640-128-001	GEMS-0202	Composite (Suwan)	Brazil	Ames	2010
200	CUBA164:S2008dF44-012-001	GEMS-0203	Mixed (Creole)	Cuba	Ames	2010
201	FS8A(T):N1804-006-001	GEMN-0204	Mixed	USA	Ames	2010
202	GUAD05:N3215-197-001	GEMN-0205	Early Caribbean	Guadalupe	Ames	2010
203	AR16035:S02-615-001-B wx	GEMS-0206	Cristalino Colorado	Argentina	Ames	2010
204	BR51403(PE001):N16-B-044-004-001-001C-001	GEMN-0207	Cateto	Brazil	NC	2010
205	BR51403(PE001):N16-B-044-004-001-002G-003	GEMN-0208	Cateto	Brazil	NC	2010
206	BR51721(RN07):N20-B-017-002	GEMN-0209	Dente Amarelo	Brazil	NC	2010
207	CL-G1607(CML420):N11-008-001-007	GEMN-0210	CML tropical inbred	Mexico	NC	2010
208	DK888:N11-B-027-012-B-007	GEMN-0212	Hybrid Tropical	Thailand	NC	2010
209	DKXL380:N11-B-007-010-B-002	GEMN-0213	Hybrid Tropical	Brazil	NC	2010
210	MDI022:N21-B-002-003	GEMN-0214	Cuban yellow	Peru	NC	2010

GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site Released	Year Released
211	NS1:S08-006-001-002	GEMS-0215	Inbred Tropical	Thailand	NC	2010
212	PASCO14:N11b-B-001-002	GEMN-0216	Cuban Yellow	Peru	NC	2010
213	DK888:N11-B-027-001-B-001	GEMN-0217	Hybrid Tropical	Thailand	NC	2010
214	(CUBA164:S2012-459-001-B/GEMS-0002)-B-B-011	GEMS-0218	GEM x GEM derived	USA	Ames	2011
215	(CUBA164:S2012-459-001-B/GEMS-0002)-B-B-031	GEMS-0219	GEM x GEM derived	USA	Ames	2011
216	(GEMS-0113/GEMS-0091)-B-058-001	GEMS-0220	GEM x GEM derived	USA	Ames	2011
217	BR105:N1641-159-001	GEMN-0221	Composite (Suwan)	Brazil	Ames	2011
218	MBRC10:S1741-B-057	GEMS-0222	Multiple Borer Composite	Mexico	Ames	2011
219	CUBA164:S2012-444-001-B wx	GEMS-0223	Mixed (Creole)	Cuba	Ames	2011
220	BG070404:D27S42-B-014	GEMS-0224	Unclassified	Venezuela	Ames	2012
221	BR105:N16a16b-B-074	GEMN-0225	Composite (Suwan)	Brazil	Ames	2012
222	BR106:S(LH132)(PHG39)-B-053	GEMS-0226	Composite (Tuxpeño)	Brazil	Ames	2012
223	NEI9004:S2809-B-022	GEMS-0227	Inbred Tropical	Thailand	Ames	2012
224	NEI9004:S2809-B-025	GEMS-0228	Inbred Tropical	Thailand	Ames	2012
225	SANM126:N12(LH123)-B-033	GEMN-0229	Cuban yellow	Peru	Ames	2012
226	CML413:N18-001-036-002	GEMN-0230	CML tropical inbred	Mexico	NC	2012
227	CUBA164:D27-B-017-001	GEMN-0231	Mixed (Creole)	Cuba	NC	2012
228	SCR Gp3:N14-028-003-B-002	GEMN-0232	Tusón	St. Croix	NC	2012
229	CML329:N18-001-020-001	GEMN-0233	CML tropical inbred	Mexico	NC	2012
230	AR17026:S1648-B-030	GEMS-0234	Cristalino Colorado	Argentina	Ames	2013
231	CUBA173:S0446-B-030	GEMS-0235	Criollo/Tuson	Cuba	Ames	2013
232	DK212T:N11a10-B-110	GEMN-0236	Hybrid Tropical	Thailand	Ames	2013
233	DKXL370:S08c17c-B-008	GEMS-0237	Hybrid Tropical	Brazil	Ames	2013
234	NEI9004:N0803-B-027	GEMN-0238	Inbred Tropical	Thailand	Ames	2013
235	NEI9004:N0803-B-053	GEMN-0239	Inbred Tropical	Thailand	Ames	2013
236	UR13085:S(N28)(CUBA117:S1520-156-1-B-B)-B-023	GEMS-0240	Cateto Sulino	Uruguay	Ames	2013
237	UR13085:S(N28)(CUBA117:S1520-156-1-B-B)-B-058	GEMS-0241	Cateto Sulino	Uruguay	Ames	2013
238	SE32(BR52051):N11c-015-004-B	GEMN-0242	Dente Amarelo	Brazil	NC	2013
239	CML287:S15-024-003-B	GEMS-0243	CML tropical inbred	Mexico	NC	2013
240	CML287:S15-027-001-B	GEMS-0244	CML tropical inbred	Mexico	NC	2013
241	DK888:S11b-037-018-008-B	GEMS-0245	Hybrid Tropical	Thailand	NC	2013
242	AR01150:N0402-B-026	GEMN-0246	Dentado Blanco Rugoso	Argentina	Ames	2014
243	AR03056:N0902-064-001-B-B	GEMN-0247	Dentado Blanco	Argentina	Ames	2014
244	AR16042:S2028-B-012-B-B	GEMS-0248	Cristalino Colorado	Argentina	Ames	2014
245	BR105:N1643-B-020-B-B	GEMN-0249	Composite (Suwan)	Brazil	Ames	2014

GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site Released	Year Released
246	CL-G1703:S17c43-B-023-B-B	GEMS-0250	Tropical Line	CIMMYT	Ames	2014
247	CL-G1703:S17c43-B-026-B-B	GEMS-0251	Tropical Line	CIMMYT	Ames	2014
248	DKB844:N11b18-241-001-B-B	GEMN-0252	Hybrid Tropical	Mexico	Ames	2014
249	DK212T:S0640-034-002	GEMS-0253	Hybrid Tropical	Thailand	NC	2015
250	FS8B(T):N11a-225-002	GEMN-0254	Mixed	USA	NC	2015
251	FS8B(S):S03-133-002	GEMS-0255	Mixed	USA	NC	2015
252	NS1:S0834-006-002	GEMS-0256	Suwan	Thailand	NC	2015
253	CHIS462:N08d-013-001	GEMN-0257	Tuxpeño	Mexico	NC	2015
254	DKB830:S19-009-004	GEMS-0258	Hybrid Tropical	Mexico	NC	2015
255	SCR01:N11c-015-002	GEMN-0259	St. Croix	St. Croix	NC	2015
256	(GEMN-0140/GEMN-0097)-B-B-026-B-B	GEMN-0260	GEM x GEM derived	USA	Ames	2015
257	(GEMN-0140/GEMN-0097)-B-B-027-B-B	GEMN-0261	GEM x GEM derived	USA	Ames	2015
258	(GEMS-0147/GEMS-0180)-B-104-001-B-B	GEMS-0262	GEM x GEM derived	USA	Ames	2015
259	BR105:S1626(GEMS-0175)-B-049-B-B	GEMS-0263	Composite Suwan/Tusón	Brazil/BVIR	Ames	2015
260	BR105:S1643-078-001-B-B	GEMS-0264	Composite Suwan	Brazil	Ames	2015
261	DKXL212:S0950-B-083-B-B	GEMS-0265	Hybrid Tropical	Brazil	Ames	2015
262	NEI9008:N0826(GEMN-0155)-B-074-B-B	GEMN-0266	Suwan/Cristalino Colorado	Thailand/Argentina	Ames	2015
263	NEI9008:N0826(GEMN-0155)-B-095-B-B	GEMN-0267	Suwan/Cristalino Colorado	Thailand/Argentina	Ames	2015
264	NS1:S0852-B-021-B-B	GEMS-0268	Suwan	Thailand	Ames	2015
265	NS1:S0852-B-054-B-B	GEMS-0269	Suwan	Thailand	Ames	2015
266	ANTIG01:N16-050-002	GEMN-0270	Criollo	Antigua	NC	2016
267	BR105:N16-043-001	GEMN-0271	Composite (Suwan)	Brazil	NC	2016
268	(GEMN-0043xGEMN-0097)-B-001	GEMN-0272	GEM x GEM derived	USA	NC	2016
269	(GEMS-0032xGEMS-0050)-B-007	GEMS-0273	GEM x GEM derived	USA	NC	2016
270	(GEMS-0032xGEMS-0113)-B-004	GEMS-0274	GEM x GEM derived	USA	NC	2016
271	((KO679Y/GEMS-0115)/GEMS-0162)-008-001	GEMS-0275	Hybrid Tropical	S. Africa/Mexico	Ames	2016
272	(53SS4/GEMS-0026)-SIB-B-003	GEMS-0276	Hybrid Tropical	Brazil	Ames	2016
273	(53SS4/GEMS-0031)-SIB-B-039	GEMS-0277	Hybrid Tropical	Brazil	Ames	2016
274	(GEMS-0115/S49w)-B-B-036	GEMS-0278	Hybrid Tropical	Mexico	Ames	2016
275	(GEMS-0176/S49w)-B-B-028	GEMS-0279	Mixed (Creole)	Cuba	Ames	2016
276	BR52051:S172641-B-018	GEMS-0280	Dente Amarelo	Brazil	Ames	2016
277	BR52051:S172641-B-054	GEMS-0281	Dente Amarelo	Brazil	Ames	2016
278	CHIS740:S(PHW17)(87916W)-126-001	GEMS-0282	Tuxpeno/Olotillo	Chile	Ames	2016
279	UR11002:S1409-068-001	GEMS-0283	Dente Branco	Uruguay	Ames	2016
280	AR17056:S1217-B-025	GEMS-0284	Cristalino Colorado	Argentina	Ames	2016

GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site Released	Year Released
281	(GEMN-0117/DKXL212:N11a-139-001-001-B-B-B-B-B-B)-B-B-019	GEMN-0285	Tusón/Canilla	Dom. Republic	Ames	2016
282	MDI022:N(PHG35)(GEMN-0097)-072-001	GEMN-0286	Cuban yellow	Peru	Ames	2016
283	(GEMN-0108xGEMN-0178)-B-004	GEMN-0287	GEM x GEM derived	USA	NC	2016
284	(GEMS-0147/GEMS-0115)-B-002-001-001-B	GEMS-0288	GEM recycle	USA	Ames	2017
285	(GEMS-0147/GEMS-0180)-B-033-001-001-B	GEMS-0289	GEM recycle	USA	Ames	2017
286	BR52051:S172641-B-050-001-B	GEMS-0290	Dente Amarelo	Brazil	Ames	2017
287	Ki21:S(DJ7)(GEMS-0115)-B-051-002-B	GEMS-0291	Tropical Inbred x GEM	Thailand	Ames	2017
288	(GEMN-0097/GEMN-0136)-B-008	GEMN-0292	GEM x GEM derived	USA	NC	2017
289	CML341:S42-B-124	GEMS-0293	Tuxpeño	Mexico	NC	2017
290	DKB844:S16-005-022-012	GEMS-0294	Hybrid Tropical	Mexico	NC	2017
291	DKB830:S51-031-003	GEMS-0295	Hybrid Tropical	Mexico	NC	2017
292	(GEMS-0113/GEMS-0162)-B-B-054-001	GEMS-0296	GEM recycle	USA	Ames	2018
293	(GEMS-0115/GEMS-0222)-B-B-033-001	GEMS-0297	GEM recycle	USA	Ames	2018
294	(GEMS-0219/GEMS-0227)-B-015-001	GEMS-0298	GEM recycle	USA	Ames	2018
295	(H8431/((GEMS-0115/Mp717)/TZAR101))-SIB-B-005-001	GEMS-0299	Tropical Hybrid/Tropical Inbred	Mexico/Nigeria	Ames	2018
296	NS1:S(GEMS-0149)41-051-001-001	GEMS-0300	Suwan	Thailand	Ames	2018
297	NS1:S(GEMS-0149)41-066-001-001	GEMS-0301	Suwan	Thailand	Ames	2018
298	ATL100:N(LH82)(GEMN-0097)-041-001	GEMN-0302	Tropical Hybrid	Brazil	Ames	2018
299	(GEMS-0162/GEMS-0227)-040-002-001	GEMS-0303	Argentino/Tropical Inbred	Cuba/Thailand	Ames	2019
300	(GEMS-0162/GEMS-0227)-046-001-001	GEMS-0304	Argentino/Tropical Inbred	Cuba/Thailand	Ames	2019
301	(GEMS-0227/PHP38)-018-001-001	GEMS-0305	Tropical Inbred	Thailand	Ames	2019
302	((LH195/KO679Y)/GEMS-0227)-010-001-002	GEMS-0306	Tropical Inbred/Tropical Inbred	South Africa/Thailand	Ames	2019
303	((PHB47/CML373)/GEMS-0162)-SIB-053-002	GEMS-0307	Tropical Inbred/Argentino	Mexico/Cuba	Ames	2019
304	((PHB47/CML373)/GEMS-0162)-SIB-086-001	GEMS-0308	Tropical Inbred/Argentino	Mexico/Cuba	Ames	2019
305	ATL100:N(LH82)(GEMN-0097)-090-001	GEMN-0309	Tropical Hybrid	Brazil	Ames	2019
306	(GEMN-0104/GEMN-0097)-070-003	GEMN-0310	Mixed	Thailand/USA	NC	2019
307	BR106:S42-063-002	GEMS-0311	Tuxpeño	Brazil	NC	2019
308	PASCO14:S11a-128-003	GEMS-0312	Cuban yellow	Peru	NC	2019
1	DKXL212:N11a-139-001-001	DE EXP	Hybrid Tropical	Brazil	UDEL	2003
2	DE3 (DKXL212:N11a-191)	DE3	Hybrid Tropical	Brazil	UDEL	2002
3	DE4 (DKXL212:N11a-365)	DE4	Hybrid Tropical	Brazil	UDEL	2002
4	DE6 (DKXL212:N11a-234)	DE6	Hybrid Tropical	Brazil	UDEL	2005
5	NY212 (FS8B(T):N1802-212)	NY212	Mixed	USA	Cornell U	2009
6	NY215 (FS8B(T):N1802-215)	NY215	Mixed	USA	Cornell U	2009

GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site Released	Year Released
7	NY266 (AR01150:N0406-266)	NY266	Dent. Blanco Rugoso	Argentina	Cornell U	2009
8	Tx204 (AR01150:N0406)	Tx204	Dent. Blanco Rugoso	Argentina	Texas A&M	2004
9	Tx205 (AR01150:N0406)	Tx205	Dent. Blanco Rugoso	Argentina	Texas A&M	2004
10	W605S (AR17026:N1019)	W605S	Cristalino Colorado	Argentina	U of Wisc.	2004
11	W606S (SCRO1:N1310)	W606S	St. Croix	St. Croix	U of Wisc.	2009
12	W607S (BR52051:N04)	W607S	Dente Amarelo	Brazil	U of Wisc.	2009
13	W608S (CH05015:N15)	W608S	Camelia	Chile	U of Wisc.	2009
14	W609S (FS8B(T):N11a)	W609S	Mixed	USA	U of Wisc.	2009
15	W610S (CUBA164:S2012)	W610S	Mixed (Creole)	Cuba	U of Wisc.	2009
16	W615S (GEM Quality Syn. GQS C0)	W615S	Criollo/Argentino	Cuba	U of Wisc.	2013
17	W616S (AR16026:S1719)	W616S	Cristalino Colorado	Argentina	U of Wisc.	2013

Bolded codes are Crop Science Registered

Yield Trials

2018 Yield Trial Data (Top 20 Entries Ranked)

Experiment 21

Tester: Various

		All location Means						Percent			Rating
											Gray Leaf Spot (1-9 scale, 1 = best)
Entry	Pedigree	Yield	% Yield /CHK	Moist	Yield/ Moist	Plant Height	Ear Height	Stalk Lodging	Root Lodging	Erect Plants	
56	P2088R	169	110	18.0	9.4	301	108	3	3	93	0.9
24	NC320 x NC368	161	105	17.7	9.1	323	146	6	5	89	0.6
62	P31G65	160	105	17.3	9.2	305	119	5	4	91	1.8
54	P1197R	149	97	16.2	9.2	264	97	2	2	96	1.6
57	NC320.NC368 x (NC476x(P3737.NC492BC))	148	97	18.3	8.1	312	135	5	4	91	0.2
60	DK697	147	96	17.8	8.3	287	117	3	3	94	1.4
25	NC320 x P1498	144	94	17.3	8.3	292	125	3	3	94	0.3
58	NC320.NC368 x PHN47.DKHBA1	143	93	17.4	8.2	311	133	5	5	89	0.5
59	NC368.NC320 x DKHBA1.NC476	143	93	17.2	8.3	305	128	5	5	90	0.7
53	P1498	142	93	17.2	8.3	270	94	3	2	95	0.7
21	LH252 x LH132.PHG39	140	92	17.3	8.1	315	131	4	4	92	2.3
29	PHAG6 x LH283.LH287	138	90	16.5	8.4	283	106	5	5	91	2.0
6	DK_HBA1.NC476 x NC320.NC368	137	90	17.4	7.9	303	130	4	4	91	0.6
3	DK_8M116 x LH283.LH287	134	88	16.3	8.2	287	105	4	1	94	0.9
27	NC476 x DKHBA1	134	88	17.4	7.7	284	119	4	5	91	1.9
4	DK_8M116 x LH132.PHG39	132	86	17.7	7.5	295	113	3	3	94	1.5
10	Dow_NS815 x LH287.LH283	132	86	16.0	8.3	279	105	6	5	89	1.6
32	PHAP1 x LH132.PHG39	132	86	17.3	7.6	291	114	4	5	91	1.3
36	PHBE2 x LH132.PHG39	132	86	17.2	7.7	293	113	5	5	91	2.3
61	B73 x LH287.LH283	132	86	16.6	8.0	286	109	7	6	87	2.8
Replications		16			16	16	14	7	5	5	3
Test Entry Means		157			18	9.0	59	281	127	2	1.3
Check Means		187			17.9	10.5	58.8	265	114	3	0.2
Overall Means		167			17.7	9.5	58.6	276	122	2	1.0
Range		150-211			15.9-19.4	8.2-11.8	57.2-60.2	252-290	103-135	0-8	0-4
CV		11.0			4.6	11.1	2.1	3.3	5.8	289	248
LSD (p=0.05)		12.3			0.6	0.7	0.8	6.1	4.8	4	1.7

*GLS data collected at 3 locations with 2 reps/location

2018 Yield Trial Data (Top 20 Entries Ranked)

Experiment M1

Tester: LH132.PHG39

		<i>All location Means</i>								<i>Percent</i>			<i>Rating</i>
<i>Entry</i>	<i>Pedigree</i>	<i>Yield</i>	<i>% Yield /CHK</i>	<i>Variance</i>	<i>Moist</i>	<i>Yield/ Moist</i>	<i>Test Weight</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Stalk Lodging</i>	<i>Root Lodging</i>	<i>Erect Plants</i>	<i>Gray Leaf Spot (1-9 scale, 1 = best)</i>
27	DeKalb 67-44	211	118	1061	18.0	11.8	59.2	267	110	3	0	98	1.4
26	Pioneer 2088R [#]	205	114	1192	19.4	10.6	58.2	284	120	1	1	98	1.1
25	Pioneer 1745R	197	110	1215	18.0	11.0	57.2	288	126	6	1	94	1.1
28	DeKalb 67-72	190	106	1218	17.6	10.9	58.5	252	113	1	0	99	1.7
24	DeKalb 65-18	186	104	1029	17.8	10.5	60.2	253	103	2	0	98	1.4
21	Pioneer 1498	181	101	976	17.7	10.2	59.1	269	113	1	0	99	1.1
23	Pioneer 1197R [#]	180	101	1420	15.9	11.4	58.3	252	108	1	0	99	1.3
22	DeKalb 64-69	179	100	1415	17.1	10.5	59.1	254	107	7	0	94	3.4
30	DeKalb 68-04	178	99	1003	18.7	9.6	58.0	265	115	1	0	99	1.8
29	DeKalb 697	173	97	496	18.6	9.3	59.1	274	126	0	0	100	1.6
17	GEMN-0272	168	90	733	17.5	9.7	58.1	288	135	1	3	97	0.2
5	(GEMN-104/GEMN-97)-070-03	165	88	828	18.0	9.3	58.1	290	130	2	1	97	0.9
15	GEMN-0097	164	87	810	16.6	9.9	59.1	277	125	1	1	99	1.0
1	(GEMN-104/GEMN-97)-022-01	161	86	776	17.7	9.0	57.4	273	120	1	0	99	0.2
13	NS1:(GEMN-0097)-B63-01	161	86	731	17.3	9.4	58.8	277	122	2	0	98	2.3
6	(GEMN-104/GEMN-97)-083-02	160	86	1259	17.6	9.2	58.6	281	131	1	0	99	1.3
2	(GEMN-104/GEMN-97)-022-04	159	85	725	17.8	8.8	58.1	283	117	1	0	99	1.7
7	(GEMN-104/GEMN-97)-084-02	158	84	1903	17.8	8.9	58.6	283	121	2	0	98	0.4
12	NS1:(GEMN-0097)-B58-03	158	84	1020	17.5	9.1	58.8	288	131	2	1	98	0.2
4	(GEMN-104/GEMN-97)-055-02	157	84	898	17.0	9.3	59.3	275	126	2	3	96	0.7
	Replications	16			16	16	14	7	5	5	8	11	3
	Test Entry Means	157			18	9.0	59	281	127	2	1	97	1.7
	Check Means	187			17.9	10.5	58.8	265	114	3	0	98	1.2
	Overall Means	167			17.7	9.5	58.6	276	122	2	1	97	1.4
	Range	150-211			15.9-19.4	8.2-11.8	57.2-60.2	252-290	103-135	0-8	0-4	91-100	0.2-3.4
	CV	11.0			4.6	11.1	2.1	3.3	5.8	289	248	6.2	7.1
	LSD (p=0.05)	12.3			0.6	0.7	0.8	6.1	4.8	4	2	4	0.6

*GLS data collected at 3 locations with 2 reps/location

2018 Yield Trial Data (Top 21 Entries Ranked)

Experiment M3

Tester: LH283.LH287

		<i>All location Means</i>								<i>Percent</i>			<i>Rating</i>
<i>Entry</i>	<i>Pedigree</i>	<i>Yield</i>	<i>% Yield /CHK</i>	<i>Variance</i>	<i>Moist</i>	<i>Yield/ Moist</i>	<i>Test Weight</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Stalk Lodging</i>	<i>Root Lodging</i>	<i>Erect Plants</i>	<i>Gray Leaf Spot (1-9 scale, 1 = best)</i>
45	DeKalb 67-44	220	113	1098	18.1	12.1	59.3	276	113	3	0	97	1.2
44	Pioneer 2088R	212	108	1279	19.5	11.0	57.6	280	123	2	0	98	0.8
43	Pioneer 1745R	203	104	958	18.2	11.2	57.1	288	129	3	1	97	1.3
42	DeKalb 65-18	195	100	1196	18.2	10.9	59.7	256	100	5	0	96	1.6
25	GEMS-0243	188	97	1051	19.1	10.0	57.5	291	132	3	1	97	1.7
47	DeKalb 697	188	96	716	19.1	9.9	58.4	280	128	4	0	97	1.4
46	DeKalb 67-72	187	96	721	17.7	10.7	57.6	261	113	1	0	99	1.7
33	GEMS-0294	186	95	1414	18.7	10.0	57.6	278	127	2	0	98	1.2
39	Pioneer 1498	185	95	794	17.7	10.5	58.6	262	114	1	0	99	1.2
40	DeKalb 64-69	185	95	978	17.5	10.7	58.7	256	109	0	0	100	2.8
32	GEMS-0293	184	95	1039	18.9	9.9	57.2	282	129	4	1	96	1.3
48	DeKalb 68-04	183	94	996	19.6	9.5	57.2	265	115	1	0	99	1.5
37	PHMK0/DKHBA1	181	93	2008	18.1	10.2	55.7	279	131	2	2	97	1.8
41	Pioneer 1197R	180	92	1099	16.1	11.3	57.9	258	110	1	0	99	1.6
34	GEMS-0295	179	92	1088	18.8	9.7	57.2	282	129	8	3	91	0.9
20	PASCO14:S11a-128-003	179	92	1597	18.3	9.9	56.5	287	126	11	5	87	0.7
23	GEMS-0113	177	91	768	18.4	9.7	58.5	285	128	5	1	95	0.8
1	BR51675:D27S21-011-01	176	91	872	18.5	9.6	57.4	281	115	6	1	95	1.4
4	BR51675:D27S21-041-02	176	90	1093	18.4	9.6	57.9	292	131	5	6	91	1.9
29	GEMS-0289	175	90	912	18.2	9.7	58.0	284	127	8	0	94	1.5
17	BR106:S42-063-002	175	90	998	19.1	9.3	57.3	281	130	1	1	98	1.9
Replications		14			14	14	12	4	7	7	9	10	3
Test Entry Means		170			18.7	9.2	57	281	128	5	2	94	1.6
Check Means		195			18.4	10.7	58	269	116	2	0	98	1.5
Overall Means		177			18.4	9.7	57.7	279	125	3.5	1.5	96	1.5
Range		163-220			16.1-19.6	8.5-12.1	56.6-59.7	256-292	100-140	0-12	0-6	87-100	0.7-2.8
CV		9.6			5.0	10.5	2.0	3.2	6.3	150	212	5.7	7.2
LSD (p=0.05)		11.4			0.6	0.7	0.8	6.1	5.4	3.5	2.1	3.7	0.6

*GLS data collected at 3 locations with 2 reps/location

2018 GEM Ames Yield Trial Summary

Expt #	Material	Tester	Entries	Reps	Entry Yield Avg.	Check Yield Avg.	Overall Yield Avg.	CV (%)
1813101	Ki 14:N4212	MBS3520	48	4	143.7	180.4	148.1	17.7
1813102	Ki 14:N4212	MBS3520	48	6	150.1	187.6	154.2	16.2
1813103	SX1078:N(LH61)(ANTIG03:N1242-B-007-B)	MBS3520	60	6	139.5	191.9	143.8	16.0
1813104	SX1078:N(LH61)(ANTIG03:N1242-B-007-B)	MBS3520	60	6	150.7	202.8	155.1	14.4
1813105	GEMS-0227/Ki 14//12	MBS8731	60	6	167.5	190.1	169.4	14.4
1813106	GEMS-0227/Ki 14//12	MBS8731	48	6	167.8	182.4	169.3	12.6
1813107	KO679Y/GEMS-0030//12	MBS8731	60	6	189.0	205.4	190.4	11.6
1813108	KO679Y/GEMS-0030//12	MBS8731	48	6	191.2	202.2	192.3	10.2
1814101	MBRC10:N1730-B-128-B/GEMN-0205; PHP02/(LH61/MSU_1); TZAR104:N(LH61)(ANTIG03:N1242-B-007-B)	MBS3520	60	6	165.6	199.8	168.6	14.4
1814102	MBRC10:N1730-B-128-B/LH185; PHN18/GEMN-0246; PHP02/MBRC10:N1730-B-128-B; SX1078:N(LH61)(ANTIG03:N1242-B-007-B)	MBS3520	48	6	162.1	192.0	165.3	17.0
1853101	(GEMS-0162/GEMS-0226)/GEMS-0219; GEMS-0219/(GEMS-0162/GEMS-0226); GEMS-0226/(GEMS-0227/PHP38)	MBS5562	60	6	189.5	214.8	191.6	9.4
1853102	(GEMS-0182/GEMS-0227)/GEMS-0219; GEMS-0219/(GEMS-0182/GEMS-0227)	MBS5562	60	6	192.2	216.4	194.2	9.7
1853103	GEMS-0162/PHP38//GEMS-0227	TR6828	72	6	197.7	213.9	198.8	10.3
1854101	GEMN-0097/TF-2-0-T3-P74-G121	MBS3520	96	6	157.7	191.7	159.5	15.0
1854102	GEMS-0227/GEMS-0189	MBS5562	60	6	190.5	211.7	192.3	9.6
1854103	GEMS-0227/GEMS-0189	MBS5562	60	6	194.4	220.4	196.1	10.1
1854104	GEMS-0162/PHP38//GEMS-0227	MBS8731	60	6	211.6	218.4	212.1	8.2
1854105	GEMS-0162/PHP38//GEMS-0227	MBS8731	48	6	189.5	202.4	190.8	10.8
1854106	GEMS-0162/PHP38//GEMS-0227	MBS8731	48	6	205.2	220.6	206.8	9.4
1854107	GEMN-0207/12	MBS3520	60	5	171.4	198.6	173.6	11.4
1854108	GEMN-0207/12	MBS3520	48	4	168.0	195.7	170.9	12.2
1863101	(B97xPHR03)/GEMN-0239; GEMN-0205/(GEMN-0097/PHN46); GEMN-0239/(KO679Y/GEMN-0097); LH185/(LH61/MSU_1)	MBS3520	60	5	184.0	218.7	186.9	11.4
1863102	(GEMN-0140/GEMN-0130)/GEMN-0097; (KO679Y/GEMN-0097)/GEMN-0239; GEMN-0186/DKXL370:N11a20-036-002-B-B-B; GEMN-0221/KUI44:N(SG17)	MBS3520	60	6	176.2	213.2	179.4	13.1
1863103	MBRC10:N1730-B-128-B/LH185; GEMN-0246/PHN18; MBRC10:N1730-B-128-B/(GEMN-0140/GEMN-0097)	TR6402, MBS3520	48	6	175.9	203.6	178.8	12.1
1863104	GEMS-0227/PHP38//GEMS-0226; GEMS-0227/CUBA164:T26aS41-B-040-B	MBS5562	60	6	193.9	209.8	195.2	10.6
1864101	((NKS8326/CML373)/GEMN-0097)-SIB/3IIH6; ((NKS8326/CML373)/GEMN-0097)-SIB/PHG29; (Oh7B/KO679Y)/3IIH6; 3IIH6/MBRC10:N1730-B-128-B; 3IIH6/GEMN-0205	MBS3520	60	6	161.1	209.0	165.1	13.4
1864102	DKXL370:N11a20-036-002-B-B-B/GEMN-0186; GEMN-0192/GEMN-0210; GEMN-0192/GEMN-0242; GEMN-0210/GEMN-0192; KUI44:N(SG17)/GEMN-0221	MBS3520	48	6	181.0	190.6	181.6	12.5
1864103	(GEMN-0097/PHN46)/GEMN-0205; GEMN-0097/(GEMN-0140/GEMN-0130); GEMN-0205/(GEMN-0140/GEMN-0097)	MBS3520	60	6	182.1	200.3	183.6	11.3
1864104	GEMS-0219/3IIH6; (GEMS-0227/Ki14)/(B126xPHP38); GEMS-0226/(GEMS-0182/GEMS-0227)	MBS5562	36	6	185.3	215.9	188.8	10.3
1864105	(B126xB84)/(GEMS-0147/GEMS-0227); (GEMS-0147/GEMS-0227)/GEMS-0219; (GEMS-0147/GEMS-0227)/PHP38; 794/(LH195/KO679Y); GEMS-0219/CUBA164:S(NEI9004)(GEMS-0175)	MBS8731	60	5	194.3	201.7	194.9	9.5
1864106	(LH195/KO679Y)/794; GEMS-0219/(B126xB84); GEMS-0219/CML373:S(PHJ40); GEMS-0237/TZAR104:S(PHJ40); KO679Y/GEMS-0227; PHP38/(GEMS-0227/Ki14)	MBS8731	60	5	181.7	192.0	182.6	11.1
1864201	Retest 1	MBS2655	36	8	181.3	202.9	184.3	13.6
1864202	Retest 2	MBS2655	36	7	176.4	205.6	180.4	13.0
1864203	Retest 3	MBS2655, MBS3520	48	8	189.6	201.4	190.9	13.7
1864204	Retest 4	MBS5562	48	8	199.3	214.5	200.9	8.8
1864205	Retest 5	MBS5562	48	8	190.4	217.9	193.3	10.7
1864206	Retest 6	MBS5562	48	8	178.0	210.9	181.4	11.7
1864207	Retest 7	MBS8731	60	7	197.6	199.9	197.8	8.6
1864208	Retest 8	MBS8731	60	8	193.5	203.6	194.4	10.7
1864209	Retest 9	MBS8731	48	8	198.0	199.2	198.1	10.4
1864210	Retest 10	MBS8731	36	8	194.2	205.5	195.8	11.5
1864211	Retest 11	MBS9451	48	7	185.2	196.7	186.4	11.2
1864212	Retest 12	MBS9451	48	8	195.3	205.0	196.3	10.6
1864213	Retest 13	MBS9451	36	8	192.9	203.5	194.4	9.8
1864214	Retest 14	MBS3520	36	6	178.3	205.7	182.1	13.1
Total: 45					181.3	203.7	183.5	11.8

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1813105

Tester: MBS8731

		All Location Means									
		Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
Entry	Pedigree										
58	Pioneer 31D58	207.5	109.2	19.2	10.8	58.2	5.0	0.0	280	130	21
7	((GEMS-0227/Ki14)/12)-009-001/MBS8731	202.6	106.6	20.7	9.8	55.9	4.7	0.0	285	130	9
43	((GEMS-0227/Ki14)/12)-049-001/MBS8731	199.1	104.7	19.2	10.4	55.7	7.3	0.0	265	118	2
5	((GEMS-0227/Ki14)/12)-006-001/MBS8731	195.1	102.6	19.6	9.9	56.7	12.3	6.2	278	125	8
37	((GEMS-0227/Ki14)/12)-043-001/MBS8731	194.8	102.5	19.0	10.3	53.6	4.6	0.0	273	123	16
17	((GEMS-0227/Ki14)/12)-020-001/MBS8731	194.7	102.4	19.0	10.2	55.4	4.0	0.0	278	125	6
44	((GEMS-0227/Ki14)/12)-050-001/MBS8731	194.4	102.3	19.5	10.0	55.9	7.0	0.0	273	115	11
59	MBS3640GT/MBS8731	190.9	100.4	18.0	10.7	54.2	1.1	4.9	275	118	60
57	Pioneer P1151	188.4	99.1	18.0	10.4	57.1	8.5	7.7	263	113	0
34	((GEMS-0227/Ki14)/12)-040-001/MBS8731	187.9	98.8	19.9	9.4	56.1	3.1	0.0	258	110	4
38	((GEMS-0227/Ki14)/12)-044-001/MBS8731	186.5	98.1	19.6	9.5	56.4	6.9	0.0	260	115	3
36	((GEMS-0227/Ki14)/12)-042-001/MBS8731	185.4	97.5	20.1	9.2	56.6	7.5	4.3	278	128	2
1	((GEMS-0227/Ki14)/12)-001-001/MBS8731	184.4	97.0	19.0	9.7	55.5	4.8	0.0	278	123	11
22	((GEMS-0227/Ki14)/12)-025-001/MBS8731	184.1	96.8	19.5	9.4	55.9	8.4	0.0	273	120	7
60	MBS3520/MBS5562	182.6	96.1	16.1	11.4	54.2	1.4	8.4	260	110	0
29	((GEMS-0227/Ki14)/12)-033-001/MBS8731	182.2	95.8	19.7	9.2	55.2	2.1	1.5	273	123	7
56	Pioneer P0987	181.1	95.3	17.5	10.4	58.1	5.8	18.0	255	118	1
2	((GEMS-0227/Ki14)/12)-002-001/MBS8731	180.3	94.8	19.4	9.2	55.2	6.2	0.9	273	123	6
9	((GEMS-0227/Ki14)/12)-011-001/MBS8731	180.3	94.8	18.9	9.6	55.1	3.0	3.8	283	125	12
50	((GEMS-0227/Ki14)/12)-056-001/MBS8731	179.7	94.5	18.7	9.6	55.8	3.3	0.0	273	120	1
Number Locations		6		6	6	5	4	2	2	2	1
Mean		169.4		19.5	8.7	55.8	4.3	2.2	275	122	17
Non Check Mean		167.5		19.7	8.5	55.7	4.3	1.7	276	123	17
Check Means		190.1		17.8	10.7	56.4	4.3	7.8	267	118	16
CV		14.4		4.4	15.1	1.4	108.9	177.4	4.0	5.7	
Yield Range		110.9 - 207.5									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa, and Ridgeway in Illinois

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1813106

Tester: MBS8731

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
46	Pioneer 31D58	197.2	108.1	19.2	10.2	57.7	5.7	0.0	270	128	28
21	((GEMS-0227/Ki14)/12)-089-001/MBS8731	196.2	107.6	18.6	10.6	56.3	0.7	4.7	270	120	1
14	((GEMS-0227/Ki14)/12)-080-001/MBS8731	194.3	106.5	18.8	10.4	55.0	8.1	0.0	280	128	2
27	((GEMS-0227/Ki14)/12)-097-001/MBS8731	192.6	105.6	19.8	9.7	54.9	5.9	4.2	268	125	7
4	((GEMS-0227/Ki14)/12)-068-001/MBS8731	192.5	105.5	18.2	10.6	55.1	3.9	9.8	283	133	7
20	((GEMS-0227/Ki14)/12)-088-001/MBS8731	191.6	105.0	18.8	10.2	54.8	4.3	0.0	275	120	6
43	((GEMS-0227/Ki14)/12)-126-001/MBS8731	191.2	104.8	18.5	10.4	56.5	6.0	4.0	255	115	0
9	((GEMS-0227/Ki14)/12)-073-001/MBS8731	188.2	103.2	19.0	10.0	56.6	3.4	0.0	270	115	1
45	Pioneer P1151	185.0	101.4	18.3	10.1	57.1	3.0	4.3	253	103	2
19	((GEMS-0227/Ki14)/12)-086-001/MBS8731	184.0	100.9	20.0	9.2	56.4	2.1	5.3	280	128	0
37	((GEMS-0227/Ki14)/12)-117-001/MBS8731	184.0	100.9	19.8	9.3	56.0	0.4	0.0	275	118	19
12	((GEMS-0227/Ki14)/12)-077-001/MBS8731	183.5	100.6	19.7	9.5	53.6	4.6	4.8	268	125	2
11	((GEMS-0227/Ki14)/12)-076-001/MBS8731	183.2	100.4	20.4	9.2	54.1	7.6	0.0	283	128	3
32	((GEMS-0227/Ki14)/12)-107-001/MBS8731	182.5	100.1	19.6	9.3	56.8	6.4	0.0	285	133	2
33	((GEMS-0227/Ki14)/12)-109-001/MBS8731	182.0	99.8	19.0	9.6	55.2	9.6	4.2	280	128	3
44	Pioneer P0987	181.2	99.3	17.7	10.2	58.6	5.1	0.0	250	120	1
48	MBS3520/MBS5562	175.7	96.3	16.2	10.9	54.2	11.7	8.4	253	105	0
36	((GEMS-0227/Ki14)/12)-116-001/MBS8731	175.3	96.1	18.8	9.3	55.5	3.2	0.0	263	123	15
35	((GEMS-0227/Ki14)/12)-114-001/MBS8731	175.0	95.9	19.6	8.9	56.2	3.8	0.0	265	123	18
10	((GEMS-0227/Ki14)/12)-075-001/MBS8731	174.7	95.8	19.9	8.7	55.5	7.3	0.0	265	115	15
Number Locations		6		6	6	5	4	2	2	2	1
Mean		169.3		19.6	8.7	55.5	4.1	1.7	269	120	16
Non Check Mean		167.8		19.8	8.5	55.4	4.0	1.6	270	121	15
Check Means		182.4		17.9	10.2	56.3	5.2	2.5	257	115	17
CV		12.6		4.0	13.5	1.4	116.6	186.1	3.9	4.3	
Yield Range		122.2 - 197.2									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa, and Ridgeway in Illinois

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1813107

Tester: MBS8731

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
57	Pioneer P1151	219.9	107.1	18.0	12.3	57.5	2.7	0.0	270	110	0
59	MBS3640GT/MBS8731	217.4	105.8	17.9	12.2	53.9	2.5	7.9	270	118	68
58	Pioneer 31D58	216.8	105.6	19.2	11.5	58.2	3.6	2.2	278	130	40
28	((KO679Y/GEMS-0030)/12)-039-001/MBS8731	209.6	102.0	20.4	10.5	54.7	12.3	4.0	275	128	2
22	((KO679Y/GEMS-0030)/12)-033-001/MBS8731	206.8	100.7	19.6	10.8	56.3	4.9	0.0	275	123	34
35	((KO679Y/GEMS-0030)/12)-046-001/MBS8731	204.4	99.5	18.8	11.0	56.2	2.4	2.9	270	128	14
9	((KO679Y/GEMS-0030)/12)-011-001/MBS8731	204.1	99.4	18.7	11.1	55.5	5.3	0.0	265	118	19
41	((KO679Y/GEMS-0030)/12)-053-001/MBS8731	204.0	99.3	19.6	10.5	55.0	3.0	2.2	280	130	10
31	((KO679Y/GEMS-0030)/12)-042-001/MBS8731	203.8	99.2	19.0	10.9	53.7	3.6	5.8	270	125	11
48	((KO679Y/GEMS-0030)/12)-060-001/MBS8731	202.0	98.3	20.0	10.2	55.0	6.0	2.3	278	130	13
14	((KO679Y/GEMS-0030)/12)-022-001/MBS8731	200.7	97.7	19.4	10.5	57.3	8.3	2.7	273	125	22
55	((KO679Y/GEMS-0030)/12)-067-001/MBS8731	200.4	97.6	20.3	10.0	54.4	10.4	2.0	270	125	21
20	((KO679Y/GEMS-0030)/12)-030-001/MBS8731	200.0	97.4	19.0	10.6	56.7	2.2	1.9	270	120	12
32	((KO679Y/GEMS-0030)/12)-043-001/MBS8731	199.6	97.2	20.4	10.0	53.6	6.2	4.4	268	120	15
37	((KO679Y/GEMS-0030)/12)-049-001/MBS8731	197.0	95.9	19.4	10.3	56.5	2.1	5.0	285	138	24
5	((KO679Y/GEMS-0030)/12)-007-001/MBS8731	196.9	95.9	18.7	10.7	56.5	4.0	2.9	278	115	28
40	((KO679Y/GEMS-0030)/12)-052-001/MBS8731	196.5	95.7	19.4	10.3	55.9	4.6	2.4	280	140	4
51	((KO679Y/GEMS-0030)/12)-063-001/MBS8731	196.1	95.5	19.5	10.1	54.4	9.8	2.8	278	130	48
34	((KO679Y/GEMS-0030)/12)-045-001/MBS8731	195.3	95.1	18.8	10.6	54.7	3.4	0.4	273	123	18
16	((KO679Y/GEMS-0030)/12)-025-001/MBS8731	194.5	94.7	18.6	10.6	56.0	4.5	0.0	275	128	25
Number Locations		6		6	6	5	4	4	2	2	1
Mean		190.4		19.0	10.2	55.9	6.0	2.4	272	124	20
Non Check Mean		189.0		19.1	10.0	55.8	6.2	2.4	273	125	20
Check Means		205.4		17.7	11.7	56.7	3.6	2.0	268	119	23
CV		11.6		3.4	12.8	1.3	99.4	205.2	3.0	5.4	
Yield Range		160.7 - 219.9									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa, and Elberfeld in Indiana

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1813108

Tester: MBS8731

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
47	MBS3640GT/MBS8731	215.6	106.6	18.8	11.4	54.1	4.8	0.9	265	123	69
30	((KO679Y/GEMS-0030)/12)-100-001/MBS8731	208.9	103.3	18.6	11.3	56.7	7.4	4.2	263	135	15
22	((KO679Y/GEMS-0030)/12)-091-001/MBS8731	207.9	102.8	18.9	11.1	57.8	2.1	5.9	268	130	17
14	((KO679Y/GEMS-0030)/12)-083-001/MBS8731	206.9	102.3	18.9	11.2	53.7	6.5	1.5	270	135	5
46	Pioneer 31D58	206.5	102.1	19.2	10.9	59.5	4.9	0.0	268	133	36
18	((KO679Y/GEMS-0030)/12)-087-001/MBS8731	206.1	101.9	18.8	11.1	56.2	4.0	0.0	270	135	67
8	((KO679Y/GEMS-0030)/12)-076-001/MBS8731	204.2	101.0	18.6	11.1	58.4	4.9	4.1	260	123	2
45	Pioneer P1151	204.2	101.0	18.2	11.4	57.4	0.0	0.0	235	98	1
32	((KO679Y/GEMS-0030)/12)-102-001/MBS8731	203.5	100.6	21.1	9.9	55.9	4.6	0.0	263	123	15
4	((KO679Y/GEMS-0030)/12)-071-001/MBS8731	203.0	100.4	19.3	10.6	56.0	5.3	11.8	270	128	50
34	((KO679Y/GEMS-0030)/12)-104-001/MBS8731	202.8	100.3	18.1	11.4	54.8	7.0	0.0	250	128	28
37	((KO679Y/GEMS-0030)/12)-107-001/MBS8731	202.2	100.0	19.2	10.6	54.7	11.7	4.6	270	135	4
44	Pioneer P0987	202.0	99.9	17.5	11.6	59.1	2.5	4.3	260	133	5
16	((KO679Y/GEMS-0030)/12)-085-001/MBS8731	200.6	99.2	20.3	10.1	57.6	2.2	5.3	265	138	12
21	((KO679Y/GEMS-0030)/12)-090-001/MBS8731	198.5	98.2	19.2	10.6	55.5	2.4	2.2	248	123	8
7	((KO679Y/GEMS-0030)/12)-074-001/MBS8731	198.3	98.1	18.2	11.2	53.8	24.6	7.7	265	133	4
23	((KO679Y/GEMS-0030)/12)-092-001/MBS8731	198.3	98.1	19.9	10.0	55.8	7.7	0.0	253	128	15
13	((KO679Y/GEMS-0030)/12)-082-001/MBS8731	198.2	98.0	18.7	10.7	55.9	17.7	10.3	270	130	6
1	((KO679Y/GEMS-0030)/12)-068-001/MBS8731	197.7	97.8	19.4	10.4	57.6	4.3	4.3	263	128	3
6	((KO679Y/GEMS-0030)/12)-073-001/MBS8731	197.5	97.7	20.6	9.7	55.6	2.4	16.7	255	120	6
Number Locations		6		6	6	5	4	2	2	2	1
Mean		192.3		18.9	10.3	56.1	7.4	4.2	261	128	20
Non Check Mean		191.2		19.0	10.2	56.1	7.7	4.3	262	129	20
Check Means		202.2		17.9	11.4	56.9	4.9	3.5	254	119	23
CV		10.2		3.4	11.2	1.7	91.1	126.5	3.2	4.2	
Yield Range		154.6 - 215.6									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa, and Elberfeld in Indiana

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1853102

Tester: MBS5562

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
58	MBS3640GT/MBS8731	246.8	114.0	18.2	13.6	53.9	0.6	0.0	280	130	62
56	Pioneer P1151	218.5	101.0	17.6	12.5	57.5	4.4	0.0	263	110	0
37	(GEMS-0219/(GEMS-0182/GEMS-0227))-002-001/MBS5562	215.4	99.5	16.6	13.0	55.9	6.4	0.0	268	118	3
43	(GEMS-0219/(GEMS-0182/GEMS-0227))-011-001/MBS5562	213.5	98.7	16.6	12.9	56.2	14.2	0.0	265	123	0
44	(GEMS-0219/(GEMS-0182/GEMS-0227))-013-001/MBS5562	211.3	97.6	16.5	12.9	56.9	5.6	4.2	268	123	1
45	(GEMS-0219/(GEMS-0182/GEMS-0227))-013-002/MBS5562	210.2	97.1	16.2	13.0	56.5	6.4	8.6	275	130	0
28	((GEMS-0182/GEMS-0227)/GEMS-0219)-045-001/MBS5562	208.6	96.4	16.4	12.7	57.3	4.3	2.7	283	123	0
24	((GEMS-0182/GEMS-0227)/GEMS-0219)-040-001/MBS5562	207.8	96.0	16.1	12.9	56.4	12.0	2.0	275	138	7
55	Pioneer P0987	207.5	95.9	17.3	12.0	58.9	3.1	0.0	268	130	3
19	((GEMS-0182/GEMS-0227)/GEMS-0219)-031-001/MBS5562	207.2	95.7	15.6	13.4	55.6	7.6	4.9	275	128	1
40	(GEMS-0219/(GEMS-0182/GEMS-0227))-006-001/MBS5562	207.2	95.7	16.8	12.3	56.2	5.9	8.1	270	128	1
25	((GEMS-0182/GEMS-0227)/GEMS-0219)-042-001/MBS5562	206.5	95.4	15.8	13.1	56.5	8.6	2.9	268	118	1
17	((GEMS-0182/GEMS-0227)/GEMS-0219)-029-001/MBS5562	205.3	94.9	16.4	12.6	57.9	7.5	2.1	280	120	0
57	Pioneer 31D58	205.0	94.7	18.3	11.2	58.0	2.6	4.3	283	140	38
11	((GEMS-0182/GEMS-0227)/GEMS-0219)-019-001/MBS5562	204.5	94.5	15.8	12.9	56.1	9.9	0.0	273	115	2
59	MBS3520/MBS5562	204.2	94.4	16.1	12.7	54.6	7.8	5.5	270	115	0
8	((GEMS-0182/GEMS-0227)/GEMS-0219)-014-002/MBS5562	203.7	94.1	16.6	12.4	56.0	8.3	0.0	268	120	0
46	(GEMS-0219/(GEMS-0182/GEMS-0227))-015-001/MBS5562	202.9	93.8	16.4	12.4	56.3	9.9	2.6	265	118	2
53	(GEMS-0219/(GEMS-0182/GEMS-0227))-034-001/MBS5562	202.8	93.7	17.1	11.9	56.8	2.6	2.2	260	115	4
2	((GEMS-0182/GEMS-0227)/GEMS-0219)-008-002/MBS5562	201.6	93.2	16.4	12.4	56.4	11.3	2.8	278	135	0
Number Locations		6		6	6	5	6	4	2	2	1
Mean		194.2		16.4	11.9	56.8	8.0	2.0	265	119	3
Non Check Mean		192.2		16.3	11.8	56.8	8.4	2.0	265	118	1
Check Means		216.4		17.5	12.4	56.6	3.7	1.9	273	125	21
CV		9.7		2.4	9.9	1.1	77.7	215.8	4.7	6.0	
Yield Range		161.0 - 246.8									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, Atlantic, and Harcourt in Iowa

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1853103

Tester: TR6828

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
70	Pioneer 31D58	232.2	108.6	20.1	11.8	57.7	1.9	1.9	260	120	54
71	MBS3640GT/MBS8731	230.4	107.7	18.7	12.3	53.8	3.5	2.0	263	113	60
69	Pioneer P1151	222.6	104.1	18.8	12.0	57.2	4.5	2.1	248	98	0
42	((GEMS-0162/PHP38)/GEMS-0227)-261-001/TR6828	220.5	103.1	19.3	11.5	56.8	4.6	2.3	248	103	2
46	((GEMS-0162/PHP38)/GEMS-0227)-267-001/TR6828	218.9	102.3	20.0	11.1	56.6	5.4	2.6	260	108	8
4	((GEMS-0162/PHP38)/GEMS-0227)-199-001/TR6828	217.1	101.5	18.5	11.9	55.3	3.9	0.0	258	108	0
8	((GEMS-0162/PHP38)/GEMS-0227)-204-001/TR6828	214.7	100.4	20.3	10.7	56.8	5.1	1.3	243	98	48
9	((GEMS-0162/PHP38)/GEMS-0227)-206-001/TR6828	214.2	100.1	18.9	11.5	58.1	7.5	0.0	253	103	1
58	((GEMS-0162/PHP38)/GEMS-0227)-280-001/TR6828	213.6	99.9	18.0	11.9	54.8	8.1	0.0	255	115	17
32	((GEMS-0162/PHP38)/GEMS-0227)-242-001/TR6828	213.1	99.6	20.3	10.6	55.9	8.6	0.0	248	105	0
29	((GEMS-0162/PHP38)/GEMS-0227)-238-001/TR6828	212.7	99.4	19.6	11.0	57.1	14.6	3.3	260	105	4
44	((GEMS-0162/PHP38)/GEMS-0227)-263-001/TR6828	212.5	99.3	21.5	10.0	56.5	4.5	18.9	258	110	1
23	((GEMS-0162/PHP38)/GEMS-0227)-226-001/TR6828	212.3	99.3	20.0	10.7	55.1	5.8	0.0	258	110	5
52	((GEMS-0162/PHP38)/GEMS-0227)-273-002/TR6828	212.2	99.2	19.3	11.1	56.2	14.3	0.0	260	105	8
5	((GEMS-0162/PHP38)/GEMS-0227)-200-001/TR6828	210.3	98.3	19.4	11.0	56.6	4.7	0.4	260	105	1
7	((GEMS-0162/PHP38)/GEMS-0227)-202-001/TR6828	210.2	98.3	19.9	10.7	56.5	5.9	0.0	248	103	5
63	((GEMS-0162/PHP38)/GEMS-0227)-287-001/TR6828	209.0	97.7	20.1	10.4	57.9	6.1	1.6	258	110	31
43	((GEMS-0162/PHP38)/GEMS-0227)-262-001/TR6828	208.9	97.7	19.3	11.0	57.1	15.4	0.0	260	115	3
24	((GEMS-0162/PHP38)/GEMS-0227)-227-001/TR6828	208.6	97.5	19.2	11.0	56.6	1.1	2.0	248	108	9
1	((GEMS-0162/PHP38)/GEMS-0227)-194-001/TR6828	208.4	97.4	19.2	11.0	54.9	5.4	0.0	260	110	2
Number Locations		6		6	6	5	4	4	2	2	1
Mean		198.8		19.5	10.3	56.7	5.2	1.0	248	103	8
Non Check Mean		197.7		19.5	10.2	56.7	5.3	0.9	248	102	7
Check Means		213.9		18.5	11.7	56.4	3.9	3.0	254	108	24
CV		10.3		3.2	11.2	1.1	108.8	457.3	3.2	6.1	
Yield Range		162.4 - 232.2									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, Atlantic, and Mr. Pleasant in Iowa

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1854101

Tester: MBS3520

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
92	Pioneer 31D58	221.9	115.8	19.0	11.7	59.3	4.2	0.8	298	135	56
93	MBS3640GT/MBS8731	208.4	108.7	18.2	11.5	53.3	2.9	0.0	300	135	66
49	(GEMN-0097/TF-2-0-T3-P74-G121)-102-001/MBS3520	205.9	107.4	17.2	12.1	56.5	26.1	0.8	308	143	4
38	(GEMN-0097/TF-2-0-T3-P74-G121)-083-001/MBS3520	201.4	105.1	17.7	11.4	56.2	8.6	19.6	303	135	2
91	Pioneer P1151	198.7	103.7	17.4	11.5	56.8	9.8	0.0	268	105	5
44	(GEMN-0097/TF-2-0-T3-P74-G121)-088-001/MBS3520	193.5	100.9	17.0	11.5	55.8	17.5	0.7	300	128	0
66	(GEMN-0097/TF-2-0-T3-P74-G121)-147-001/MBS3520	187.9	98.0	17.1	11.1	56.2	15.2	2.3	308	133	10
74	(GEMN-0097/TF-2-0-T3-P74-G121)-156-001/MBS3520	187.7	97.9	17.6	10.8	56.6	5.9	7.5	308	130	7
71	(GEMN-0097/TF-2-0-T3-P74-G121)-152-001/MBS3520	186.9	97.5	17.9	10.5	55.8	22.4	0.0	303	138	5
31	(GEMN-0097/TF-2-0-T3-P74-G121)-067-001/MBS3520	184.9	96.5	17.5	10.7	56.3	18.2	7.0	315	135	8
79	(GEMN-0097/TF-2-0-T3-P74-G121)-172-001/MBS3520	184.3	96.1	17.7	10.5	54.8	10.0	1.9	315	130	0
52	(GEMN-0097/TF-2-0-T3-P74-G121)-110-001/MBS3520	180.4	94.1	18.3	9.9	56.3	16.2	1.1	303	140	9
75	(GEMN-0097/TF-2-0-T3-P74-G121)-157-001/MBS3520	179.7	93.7	17.9	10.2	54.4	16.3	0.0	300	133	5
78	(GEMN-0097/TF-2-0-T3-P74-G121)-163-001/MBS3520	178.8	93.3	17.8	10.1	55.8	12.6	19.6	310	140	8
16	(GEMN-0097/TF-2-0-T3-P74-G121)-028-001/MBS3520	178.4	93.1	17.8	10.1	55.5	10.6	4.7	313	130	8
56	(GEMN-0097/TF-2-0-T3-P74-G121)-122-001/MBS3520	177.6	92.6	17.9	10.1	56.3	12.0	4.4	318	145	12
17	(GEMN-0097/TF-2-0-T3-P74-G121)-029-001/MBS3520	176.7	92.2	18.0	10.1	54.9	16.6	0.0	298	135	5
60	(GEMN-0097/TF-2-0-T3-P74-G121)-133-001/MBS3520	176.2	91.9	17.1	10.4	55.3	11.1	1.7	308	143	20
30	(GEMN-0097/TF-2-0-T3-P74-G121)-062-001/MBS3520	175.1	91.3	17.5	10.1	55.5	12.2	8.0	295	120	20
24	(GEMN-0097/TF-2-0-T3-P74-G121)-044-001/MBS3520	174.9	91.2	17.1	10.3	55.3	4.3	1.5	290	123	2
Number Locations		6		6	6	4	5	4	2	2	1
Mean		159.5		17.6	9.2	55.9	14.2	6.1	304	135	12
Non Check Mean		157.7		17.6	9.1	55.8	14.5	6.3	305	136	12
Check Means		191.7		17.5	10.9	58.0	9.1	1.0	285	126	27
CV		15.0		3.0	15.5	1.4	75.6	181.4	4.6	5.6	
Yield Range		81.3 - 221.9									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa, and Farmersburg in Indiana

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1854104

Tester: MBS8731

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
49	((GEMS-0162/PHP38)/GEMS-0227)-061-002/MBS8731	238.9	109.4	18.8	12.8	55.6	7.4	0.5	260	108	10
58	Pioneer 31D58	237.7	108.8	19.0	12.5	58.8	0.7	0.0	268	120	31
2	((GEMS-0162/PHP38)/GEMS-0227)-001-002/MBS8731	236.9	108.5	18.4	13.0	55.7	1.6	0.0	258	113	3
21	((GEMS-0162/PHP38)/GEMS-0227)-029-001/MBS8731	233.7	107.0	18.2	12.9	55.9	1.4	2.8	263	105	59
22	((GEMS-0162/PHP38)/GEMS-0227)-029-002/MBS8731	233.0	106.7	18.9	12.4	56.9	4.8	2.8	260	100	8
51	((GEMS-0162/PHP38)/GEMS-0227)-067-002/MBS8731	231.0	105.8	18.5	12.7	54.6	3.2	0.0	265	110	0
5	((GEMS-0162/PHP38)/GEMS-0227)-007-002/MBS8731	229.0	104.9	17.6	13.1	56.4	3.1	0.0	260	110	11
17	((GEMS-0162/PHP38)/GEMS-0227)-020-003/MBS8731	227.4	104.1	18.5	12.4	57.2	2.5	3.8	275	120	6
37	((GEMS-0162/PHP38)/GEMS-0227)-051-002/MBS8731	226.5	103.7	18.3	12.5	56.2	1.4	2.8	250	108	11
59	MBS3640GT/MBS8731	225.2	103.1	18.2	12.3	54.5	4.5	0.0	255	110	68
45	((GEMS-0162/PHP38)/GEMS-0227)-059-001/MBS8731	223.8	102.5	18.8	12.1	57.5	3.9	0.0	250	98	7
9	((GEMS-0162/PHP38)/GEMS-0227)-013-001/MBS8731	223.3	102.2	19.3	11.7	56.6	6.5	3.0	260	115	8
48	((GEMS-0162/PHP38)/GEMS-0227)-061-001/MBS8731	223.0	102.1	18.2	12.3	56.1	7.3	2.9	260	110	42
42	((GEMS-0162/PHP38)/GEMS-0227)-055-002/MBS8731	221.7	101.5	18.2	12.2	55.4	5.4	0.0	263	113	4
53	((GEMS-0162/PHP38)/GEMS-0227)-071-001/MBS8731	220.7	101.1	19.1	11.7	57.0	8.6	5.7	255	105	10
43	((GEMS-0162/PHP38)/GEMS-0227)-057-001/MBS8731	220.4	100.9	18.8	11.9	55.3	1.4	0.0	248	103	13
11	((GEMS-0162/PHP38)/GEMS-0227)-014-002/MBS8731	219.0	100.3	19.1	11.6	55.8	5.0	0.0	248	100	12
50	((GEMS-0162/PHP38)/GEMS-0227)-067-001/MBS8731	218.4	100.0	17.5	12.6	56.1	12.7	0.0	260	113	0
15	((GEMS-0162/PHP38)/GEMS-0227)-020-001/MBS8731	218.0	99.8	18.9	11.7	56.7	5.6	3.0	255	110	4
36	((GEMS-0162/PHP38)/GEMS-0227)-051-001/MBS8731	217.9	99.8	18.7	11.6	56.0	6.3	0.0	248	100	22
Number Locations		6		6	6	4	4	3	2	2	1
Mean		212.1		18.5	11.6	56.4	4.9	1.0	254	105	13
Non Check Mean		211.6		18.5	11.5	56.4	5.0	1.0	254	105	12
Check Means		218.4		17.7	12.4	57.0	4.5	0.8	259	111	21
CV		8.2		2.8	8.9	1.2	98.5	289.2	3.3	5.8	
Yield Range		184.9 - 238.9									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa, and Elberfeld in Indiana

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1854105

Tester: MBS8731

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
47	MBS3640GT/MBS8731	214.7	106.1	18.3	11.7	53.2	2.2	0.0	270	115	67
46	Pioneer 31D58	214.0	105.7	19.3	11.1	58.2	8.1	3.1	270	123	28
25	((GEMS-0162/PHP38)/GEMS-0227)-111-001/MBS8731	213.0	105.2	18.8	11.4	54.2	3.3	2.9	260	108	11
7	((GEMS-0162/PHP38)/GEMS-0227)-083-001/MBS8731	212.6	105.0	18.5	11.4	56.0	9.0	6.4	283	123	5
31	((GEMS-0162/PHP38)/GEMS-0227)-117-001/MBS8731	211.4	104.4	18.6	11.3	55.2	3.0	0.0	250	103	1
2	((GEMS-0162/PHP38)/GEMS-0227)-077-001/MBS8731	210.2	103.9	19.0	11.0	55.4	11.1	5.6	270	115	4
15	((GEMS-0162/PHP38)/GEMS-0227)-098-001/MBS8731	209.3	103.4	18.7	11.2	55.7	6.6	0.0	265	105	5
45	Pioneer P1151	206.7	102.1	18.2	11.5	56.5	4.8	2.7	260	110	0
12	((GEMS-0162/PHP38)/GEMS-0227)-092-001/MBS8731	203.5	100.5	18.5	10.9	55.6	0.7	0.0	250	100	14
34	((GEMS-0162/PHP38)/GEMS-0227)-121-001/MBS8731	203.5	100.5	19.6	10.4	55.3	4.8	0.0	265	110	3
43	((GEMS-0162/PHP38)/GEMS-0227)-128-001/MBS8731	202.1	99.9	18.5	11.0	54.5	3.9	0.9	258	110	2
13	((GEMS-0162/PHP38)/GEMS-0227)-094-001/MBS8731	198.4	98.0	18.4	10.7	55.8	1.6	0.6	255	100	23
38	((GEMS-0162/PHP38)/GEMS-0227)-124-002/MBS8731	197.8	97.7	19.8	9.9	55.0	3.1	1.6	283	125	24
44	Pioneer P0987	196.9	97.3	17.6	11.2	57.7	10.5	6.5	258	115	5
33	((GEMS-0162/PHP38)/GEMS-0227)-119-001/MBS8731	193.8	95.8	18.7	10.3	55.3	3.6	2.9	278	120	16
32	((GEMS-0162/PHP38)/GEMS-0227)-118-001/MBS8731	193.5	95.6	18.1	10.7	55.9	4.6	3.0	265	105	9
8	((GEMS-0162/PHP38)/GEMS-0227)-085-001/MBS8731	190.7	94.2	18.2	10.4	54.5	5.3	0.0	270	108	9
9	((GEMS-0162/PHP38)/GEMS-0227)-087-001/MBS8731	190.2	94.0	18.1	10.5	55.4	3.4	1.5	260	110	7
36	((GEMS-0162/PHP38)/GEMS-0227)-123-002/MBS8731	189.9	93.8	18.6	10.3	55.8	6.3	0.0	265	110	9
10	((GEMS-0162/PHP38)/GEMS-0227)-090-001/MBS8731	188.7	93.2	19.5	9.6	55.7	7.3	4.0	263	110	4
Number Locations		6		6	6	4	4	3	2	2	1
Mean		190.8		18.5	10.3	55.3	4.7	1.9	262	108	10
Non Check Mean		189.5		18.6	10.1	55.3	4.5	1.8	262	107	9
Check Means		202.4		17.9	11.3	55.8	5.9	2.8	262	114	20
CV		10.8		2.7	11.5	1.4	90.6	213.9	3.3	7.0	
Yield Range		165.3 - 214.7									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa, and Ridgeway in Illinois

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1854106

Tester: MBS8731

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
46	Pioneer 31D58	237.8	107.8	18.9	12.5	58.6	2.1	0.6	260	115	51
39	((GEMS-0162/PHP38)/GEMS-0227)-188-001/MBS8731	230.9	104.7	19.3	12.0	56.4	26.7	0.0	268	103	9
45	Pioneer P1151	230.4	104.4	18.0	13.0	57.4	8.3	0.0	235	90	0
32	((GEMS-0162/PHP38)/GEMS-0227)-169-001/MBS8731	226.3	102.6	18.3	12.4	55.5	6.8	0.0	255	108	9
9	((GEMS-0162/PHP38)/GEMS-0227)-138-001/MBS8731	224.3	101.7	18.3	12.4	55.8	5.8	0.0	260	108	11
47	MBS3640GT/MBS8731	224.2	101.6	17.9	12.6	53.8	10.2	0.0	255	110	64
16	((GEMS-0162/PHP38)/GEMS-0227)-148-001/MBS8731	223.5	101.3	17.6	12.9	54.7	3.4	0.0	265	113	16
22	((GEMS-0162/PHP38)/GEMS-0227)-153-001/MBS8731	218.8	99.2	18.1	12.1	54.8	16.4	0.9	253	95	20
6	((GEMS-0162/PHP38)/GEMS-0227)-135-001/MBS8731	218.7	99.1	18.3	12.0	56.4	3.5	0.0	248	98	10
4	((GEMS-0162/PHP38)/GEMS-0227)-133-001/MBS8731	218.6	99.1	20.1	11.0	55.8	6.0	0.0	253	105	11
43	((GEMS-0162/PHP38)/GEMS-0227)-190-002/MBS8731	217.9	98.8	18.4	11.9	56.6	4.2	1.6	265	108	16
1	((GEMS-0162/PHP38)/GEMS-0227)-130-001/MBS8731	217.6	98.6	18.3	11.9	55.2	6.2	1.5	265	108	21
15	((GEMS-0162/PHP38)/GEMS-0227)-146-002/MBS8731	216.1	98.0	18.6	11.7	56.9	2.1	0.0	245	103	0
11	((GEMS-0162/PHP38)/GEMS-0227)-143-001/MBS8731	215.6	97.7	18.1	12.0	54.7	2.7	0.0	260	108	46
18	((GEMS-0162/PHP38)/GEMS-0227)-150-001/MBS8731	215.6	97.7	19.1	11.4	55.2	7.1	0.7	260	105	4
5	((GEMS-0162/PHP38)/GEMS-0227)-134-001/MBS8731	213.5	96.8	18.5	11.6	57.0	15.2	0.0	248	105	11
27	((GEMS-0162/PHP38)/GEMS-0227)-162-002/MBS8731	211.2	95.7	18.4	11.6	56.4	2.5	0.0	263	110	33
30	((GEMS-0162/PHP38)/GEMS-0227)-166-001/MBS8731	210.1	95.2	19.7	10.7	55.7	5.0	0.0	248	98	34
12	((GEMS-0162/PHP38)/GEMS-0227)-143-002/MBS8731	209.2	94.8	18.1	11.6	56.8	4.6	0.0	258	113	17
28	((GEMS-0162/PHP38)/GEMS-0227)-164-001/MBS8731	208.7	94.6	19.3	10.9	57.1	7.6	3.7	258	105	6
Number Locations		6		6	6	4	4	3	2	2	1
Mean		206.8		18.4	11.3	56.2	6.3	0.7	256	104	18
Non Check Mean		205.2		18.5	11.2	56.1	6.1	0.6	256	104	17
Check Means		220.6		17.7	12.5	56.6	8.2	1.7	251	106	25
CV		9.4		2.8	9.9	1.4	133.4	290.6	3.5	6.0	
Yield Range		173.0 - 237.8									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa, and Elberfeld in Indiana

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864102

Tester: MBS3520

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
9	(DKXL370:N11a20-036-002-B-B-B/GEMN-0186)-015-001/MBS3520	218.0	114.4	19.1	11.5	57.2	3.8	0.0	280	135	0
46	MBS3640GT/MBS8731	211.9	111.2	18.4	10.9	54.1	2.8	3.6	280	128	65
5	(DKXL370:N11a20-036-002-B-B-B/GEMN-0186)-008-001/MBS3520	209.5	109.9	18.6	11.3	57.2	2.9	2.7	270	135	1
21	(GEMN-0192/GEMN-0210)-018-001/MBS3520	208.3	109.3	18.6	11.2	54.8	6.6	4.5	283	140	10
45	Pioneer 31D58	206.6	108.4	19.1	10.2	57.0	4.0	1.4	285	140	49
43	Pioneer P0987	206.1	108.1	17.6	11.8	59.1	6.5	1.6	265	133	5
38	(GEMN-0210/GEMN-0192)-030-001/MBS3520	198.8	104.3	18.3	10.9	55.9	2.7	2.7	298	140	14
34	(GEMN-0210/GEMN-0192)-022-001/MBS3520	198.7	104.2	18.5	10.8	55.9	7.3	9.6	285	133	4
44	Pioneer P1151	196.6	103.1	18.5	10.7	57.6	1.7	1.4	258	113	0
19	(DKXL370:N11a20-036-002-B-B-B/GEMN-0186)-034-002/MBS3520	193.8	101.7	17.8	11.0	55.0	6.9	3.7	288	138	2
33	(GEMN-0210/GEMN-0192)-013-001/MBS3520	192.2	100.8	18.3	10.5	56.4	8.1	3.1	290	138	2
4	(DKXL370:N11a20-036-002-B-B-B/GEMN-0186)-007-001/MBS3520	191.8	100.6	16.8	11.6	55.3	9.4	10.3	288	133	0
16	(DKXL370:N11a20-036-002-B-B-B/GEMN-0186)-030-001/MBS3520	191.6	100.5	17.2	11.2	56.0	13.4	2.3	288	138	3
10	(DKXL370:N11a20-036-002-B-B-B/GEMN-0186)-017-001/MBS3520	191.2	100.3	17.2	11.3	54.4	12.4	24.2	290	140	4
25	(GEMN-0192/GEMN-0210)-025-001/MBS3520	189.4	99.4	17.5	10.8	53.9	13.7	12.5	290	138	7
26	(GEMN-0192/GEMN-0210)-025-002/MBS3520	189.3	99.3	18.8	10.2	55.5	5.0	8.6	280	135	11
23	(GEMN-0192/GEMN-0210)-020-001/MBS3520	189.1	99.2	19.3	9.8	54.7	8.7	11.4	283	143	4
1	(DKXL370:N11a20-036-002-B-B-B/GEMN-0186)-001-001/MBS3520	185.9	97.5	17.8	10.5	54.2	20.5	8.1	278	133	0
11	(DKXL370:N11a20-036-002-B-B-B/GEMN-0186)-018-001/MBS3520	183.8	96.4	17.0	11.0	54.7	21.1	3.7	280	133	0
15	(DKXL370:N11a20-036-002-B-B-B/GEMN-0186)-026-001/MBS3520	183.5	96.3	17.6	10.6	54.2	10.4	10.8	280	125	1
Number Locations		6		6	6	4	4	2	2	2	1
Mean		181.6		18.2	10.1	55.8	10.3	7.9	281	133	8
Non Check Mean		181.0		18.2	10.0	55.7	10.9	8.6	282	134	6
Check Means		190.6		17.9	11.0	57.0	5.6	2.2	272	127	24
CV		12.5		3.3	12.9	1.4	83.9	127.8	2.7	4.6	
Yield Range		117.0 - 218.0									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa, and Macon in Illinois

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864103

Tester: MBS3520

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
58	Pioneer 31D58	225.4	112.5	19.0	11.8	57.7	2.4	3.0	240	108	41
59	MBS3640GT/MBS8731	212.3	106.0	18.6	11.6	54.1	7.2	0.0	260	110	68
57	Pioneer P1151	204.2	101.9	17.9	11.6	57.2	4.9	0.0	225	88	2
44	(GEMN-0205/(GEMN-0140/GEMN-0097)-B-B-034-B)-019-001/MBS3520	202.2	100.9	16.8	12.0	55.8	21.8	2.9	255	113	2
45	(GEMN-0205/(GEMN-0140/GEMN-0097)-B-B-034-B)-021-001/MBS3520	200.2	100.0	17.0	11.8	56.0	19.5	6.4	253	113	1
46	(GEMN-0205/(GEMN-0140/GEMN-0097)-B-B-034-B)-025-001/MBS3520	200.2	100.0	17.2	11.7	56.4	10.1	5.3	248	103	3
53	(GEMN-0205/(GEMN-0140/GEMN-0097)-B-B-034-B)-034-001/MBS3520	199.9	99.8	16.7	12.1	56.0	4.4	2.7	238	98	5
16	(GEMN-0097/(GEMN-0140/GEMN-0130))-002-002/MBS3520	198.9	99.3	17.1	11.7	56.8	14.1	5.4	258	108	3
20	(GEMN-0097/(GEMN-0140/GEMN-0130))-009-001/MBS3520	194.3	97.0	15.9	12.3	55.9	8.7	27.0	255	105	6
47	(GEMN-0205/(GEMN-0140/GEMN-0097)-B-B-034-B)-026-001/MBS3520	194.3	97.0	17.7	11.0	54.8	24.0	5.9	285	125	19
21	(GEMN-0097/(GEMN-0140/GEMN-0130))-011-001/MBS3520	193.7	96.7	18.0	10.8	56.1	17.9	5.4	253	110	19
15	(GEMN-0097/(GEMN-0140/GEMN-0130))-002-001/MBS3520	193.4	96.6	17.1	11.3	55.5	10.8	5.9	243	108	39
9	((GEMN-0097/PHN46)/GEMN-0205)-021-002/MBS3520	193.3	96.5	17.5	11.0	54.6	10.3	19.4	260	105	12
39	(GEMN-0205/(GEMN-0140/GEMN-0097)-B-B-034-B)-006-001/MBS3520	193.2	96.5	16.9	11.5	55.8	11.0	5.1	253	105	10
1	((GEMN-0097/PHN46)/GEMN-0205)-002-001/MBS3520	191.5	95.6	16.8	11.4	57.0	17.2	5.6	270	123	9
51	(GEMN-0205/(GEMN-0140/GEMN-0097)-B-B-034-B)-031-001/MBS3520	190.3	95.0	17.3	11.0	56.0	9.3	9.9	255	118	2
6	((GEMN-0097/PHN46)/GEMN-0205)-019-001/MBS3520	189.5	94.6	17.4	10.9	55.9	10.7	15.7	253	115	8
5	((GEMN-0097/PHN46)/GEMN-0205)-017-001/MBS3520	189.1	94.4	17.1	11.1	56.2	11.4	9.9	258	118	8
40	(GEMN-0205/(GEMN-0140/GEMN-0097)-B-B-034-B)-007-001/MBS3520	188.8	94.3	17.7	10.7	55.2	7.3	28.0	268	115	8
52	(GEMN-0205/(GEMN-0140/GEMN-0097)-B-B-034-B)-032-001/MBS3520	188.8	94.3	16.7	11.3	55.4	22.7	5.7	265	113	14
Number Locations		6		6	6	5	4	3	2	2	1
Mean		183.6		17.1	10.8	55.7	11.9	10.3	255	110	12
Non Check Mean		182.1		17.0	10.7	55.7	12.3	10.9	256	111	11
Check Means		200.3		17.7	11.4	56.4	7.7	3.6	240	102	25
CV		11.3		3.5	11.8	1.1	63.7	129.9	5.3	7.0	
Yield Range		145.4 - 225.4									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa, and Macon in Illinois

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864105

Tester: MBS8731

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
12	((GEMS-0147/GEMS-0227)/GEMS-0219)-007-002/MBS8731	222.3	110.2	19.2	11.7	56.7	15.9	4.2	283	128	25
59	MBS3640GT/MBS8731	218.7	108.4	18.8	11.8	53.4	5.8	7.9	270	113	63
52	(794/(LH195/KO679Y))-024-001/MBS8731	208.5	103.4	19.8	10.5	55.3	6.3	0.0	255	113	4
58	Pioneer 31D58	208.3	103.3	19.9	10.5	57.8	3.8	4.3	283	130	21
2	((B126xB84)/(GEMS-0147/GEMS-0227))-002-002/MBS8731	207.9	103.1	18.8	11.1	53.4	3.5	0.0	275	123	28
24	((GEMS-0147/GEMS-0227)/GEMS-0219)-019-003/MBS8731	207.8	103.0	19.2	10.9	56.4	6.0	4.1	280	125	14
25	((GEMS-0147/GEMS-0227)/GEMS-0219)-021-001/MBS8731	207.5	102.9	19.1	10.9	56.1	7.4	4.4	278	135	15
30	((GEMS-0147/GEMS-0227)/PHP38)-006-001/MBS8731	207.1	102.7	19.8	10.5	56.0	7.1	4.2	280	133	3
26	((GEMS-0147/GEMS-0227)/GEMS-0219)-023-001/MBS8731	206.7	102.5	19.3	10.8	55.8	6.8	0.0	275	128	12
38	(794/(LH195/KO679Y))-006-002/MBS8731	206.2	102.2	18.8	11.0	56.1	12.7	0.0	258	113	9
28	((GEMS-0147/GEMS-0227)/PHP38)-002-002/MBS8731	206.0	102.1	18.7	11.1	56.3	8.8	0.0	268	120	12
3	((B126xB84)/(GEMS-0147/GEMS-0227))-005-001/MBS8731	205.9	102.1	20.0	10.4	54.8	6.4	0.0	265	120	2
17	((GEMS-0147/GEMS-0227)/GEMS-0219)-014-001/MBS8731	205.3	101.8	19.3	10.7	56.0	7.8	16.4	285	135	0
43	(794/(LH195/KO679Y))-012-002/MBS8731	205.3	101.8	19.4	10.9	53.3	6.7	0.0	275	138	32
29	((GEMS-0147/GEMS-0227)/PHP38)-005-001/MBS8731	204.5	101.4	20.7	10.0	53.9	3.4	8.6	265	123	5
22	((GEMS-0147/GEMS-0227)/GEMS-0219)-019-001/MBS8731	203.1	100.7	18.9	10.8	56.7	1.4	4.9	273	123	25
53	(GEMS-0219/CUBA164:S(NEI9004)(GEMS-0175))-007-001/MBS8731	201.9	100.1	18.9	10.7	55.8	17.4	0.0	280	135	15
44	(794/(LH195/KO679Y))-013-001/MBS8731	201.7	100.0	18.6	11.0	53.3	7.8	16.2	278	123	33
15	((GEMS-0147/GEMS-0227)/GEMS-0219)-011-001/MBS8731	201.4	99.9	18.3	11.1	56.5	5.4	4.3	273	118	55
16	((GEMS-0147/GEMS-0227)/GEMS-0219)-011-002/MBS8731	201.3	99.8	18.5	10.9	56.2	15.9	4.2	270	123	37
Number Locations		5		5	5	4	4	2	2	2	1
Mean		194.9		19.1	10.3	55.1	10.1	3.9	270	123	18
Non Check Mean		194.3		19.1	10.2	55.0	10.2	3.8	271	123	18
Check Means		201.7		18.4	11.1	56.2	8.9	5.0	267	117	17
CV		9.5		3.1	9.9	1.3	89.9	148.7	2.8	6.2	
Yield Range		170.3 - 222.3									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, and Carroll in Iowa, and Macon in Illinois

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864106

Tester: MBS8731

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
59	MBS3640GT/MBS8731	209.6	109.2	18.4	11.2	53.8	8.5	10.3	275	130	66
50	(KO679Y/GEMS-0227)-012-001/MBS8731	209.1	108.9	19.8	10.5	55.7	10.6	16.7	283	140	12
58	Pioneer 31D58	202.8	105.6	18.6	10.7	57.1	4.7	0.0	283	138	42
3	((LH195/KO679Y)/794)-002-002/MBS8731	197.2	102.7	18.0	10.9	54.1	3.3	0.0	275	130	20
39	(GEMS-0237/TZAR104:S(PHJ40))-011-001/MBS8731	197.2	102.7	19.2	10.3	52.6	14.2	16.2	278	143	11
37	(GEMS-0237/TZAR104:S(PHJ40))-007-001/MBS8731	196.0	102.1	17.3	11.2	54.2	8.3	35.5	290	138	11
44	(KO679Y/GEMS-0227)-006-002/MBS8731	195.7	101.9	20.6	9.3	54.0	12.7	8.8	285	130	3
53	(PHP38/(GEMS-0227/Ki14))-007-001/MBS8731	195.7	101.9	19.3	10.0	56.4	16.0	0.0	290	135	0
49	(KO679Y/GEMS-0227)-011-001/MBS8731	195.5	101.8	19.9	9.7	54.6	13.8	8.8	278	140	17
27	(GEMS-0219/(B126xB84))-028-001/MBS8731	194.8	101.5	18.8	10.4	56.7	6.3	0.0	278	133	25
11	((LH195/KO679Y)/794)-009-002/MBS8731	194.7	101.4	19.2	10.0	55.6	13.4	17.6	280	138	19
43	(KO679Y/GEMS-0227)-006-001/MBS8731	194.2	101.1	18.8	10.3	54.3	13.2	8.8	273	135	2
41	(KO679Y/GEMS-0227)-004-002/MBS8731	193.3	100.7	19.7	9.8	55.5	9.1	8.3	280	135	31
38	(GEMS-0237/TZAR104:S(PHJ40))-008-001/MBS8731	191.4	99.7	18.6	10.2	56.3	19.8	44.0	285	150	5
51	(PHP38/(GEMS-0227/Ki14))-004-001/MBS8731	191.2	99.6	18.7	10.0	57.1	5.1	8.3	273	130	5
57	Pioneer P1151	190.0	99.0	17.6	10.7	57.2	3.6	7.7	260	113	2
45	(KO679Y/GEMS-0227)-007-001/MBS8731	189.3	98.6	19.8	9.4	54.9	13.8	17.1	278	138	0
2	((LH195/KO679Y)/794)-002-001/MBS8731	189.1	98.5	19.6	9.5	55.2	4.6	8.1	278	133	3
4	((LH195/KO679Y)/794)-004-001/MBS8731	188.8	98.3	19.4	9.5	54.4	4.6	8.6	283	138	39
46	(KO679Y/GEMS-0227)-007-002/MBS8731	188.6	98.2	18.0	10.4	53.9	8.4	8.1	275	128	23
Number Locations		5		6	5	4	5	1	2	2	1
Mean		182.6		18.6	9.7	55.7	10.0	11.7	277	134	15
Non Check Mean		181.7		18.7	9.6	55.6	10.3	12.3	278	134	15
Check Means		192.0		17.6	10.8	56.1	6.6	5.4	271	128	23
CV		11.1		3.2	11.5	1.2	72.9		2.9	4.4	
Yield Range		157.0 - 209.6									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, and Carroll in Iowa, and Jackson in Tennessee

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864201

Tester: MBS2655

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
32	Pioneer 31D58	215.3	106.1	19.8	10.9	58.6	7.3	0.7	270	125	19.0
30	Pioneer P0987	207.5	102.3	18.2	11.5	59.4	11.4	10.7	262	120	4.0
26	ATL100:N(LH82)(GEMN-0097)-174-001/MBS2655	206.7	101.9	20.4	10.2	56.3	12.8	4.1	290	142	7.0
9	ATL100:N(LH82)(GEMN-0097)-290-001/MBS2655	206.3	101.7	18.0	11.5	55.8	17.4	5.1	287	143	22.5
29	ATL100:N(LH82)(GEMN-0097)-325-001/MBS2655	202.9	100.0	19.5	10.5	56.5	13.3	9.4	270	132	13.0
31	Pioneer P1151	202.2	99.7	18.7	10.9	57.7	7.0	1.3	232	97	0.0
23	ATL100:N(LH82)(GEMN-0097)-121-001/MBS2655	197.8	97.5	19.6	10.2	55.6	5.8	13.5	270	140	9.0
7	ATL100:N(LH82)(GEMN-0097)-202-001/MBS2655	196.1	96.6	19.0	10.3	57.2	10.2	0.7	260	115	4.0
33	MBS2655/MBS9508	195.7	96.5	18.0	11.0	58.7	14.0	5.3	263	120	9.0
34	MBS3520/MBS8814	194.0	95.6	18.9	10.5	54.2	7.1	3.2	273	125	17.0
22	ATL100:N(LH82)(GEMN-0097)-090-001/MBS2655	193.5	95.4	17.9	10.8	56.6	13.0	0.4	255	117	4.0
28	ATL100:N(LH82)(GEMN-0097)-210-001/MBS2655	192.0	94.6	18.1	10.6	57.8	12.7	8.8	247	113	3.5
3	ATL100:N(LH82)(GEMN-0097)-169-001/MBS2655	190.8	94.0	19.5	9.8	57.1	11.6	7.9	280	133	12.5
8	ATL100:N(LH82)(GEMN-0097)-230-001/MBS2655	190.8	94.0	18.7	10.2	55.6	27.9	0.8	273	130	12.5
25	ATL100:N(LH82)(GEMN-0097)-151-002/MBS2655	190.7	94.0	18.8	10.2	57.1	13.5	5.1	280	140	3.5
24	ATL100:N(LH82)(GEMN-0097)-151-001/MBS2655	188.1	92.7	19.0	10.0	56.7	10.0	5.8	265	133	5.0
4	ATL100:N(LH82)(GEMN-0097)-172-001/MBS2655	188.0	92.7	18.9	10.0	57.8	27.9	4.9	275	133	4.0
13	PUER5:N(LH61)(GEMN-0097)-SIB-109-001/MBS2655	186.0	91.7	17.8	10.6	55.9	11.2	3.2	267	122	4.5
21	ATL100:N(LH82)(GEMN-0097)-078-001/MBS2655	181.5	89.5	18.4	9.9	57.9	7.8	6.3	257	120	10.5
1	ATL100:N(LH82)(GEMN-0097)-087-001/MBS2655	180.5	89.0	18.2	10.0	57.5	8.0	4.0	267	127	15.5
Number Locations		8		8	8	7	5	4	3	3	2
Mean		184.3		18.6	10.0	56.9	14.8	5.4	268	127	10
Non Check Mean		181.3		18.6	9.8	56.7	15.6	5.5	270	128	11
Check Means		202.9		18.7	10.9	57.7	9.3	4.2	260	117	10
CV		13.6		3.1	14.4	1.6	72.4	126.0	6.5	12.1	64.8
Yield Range		150.5 - 215.3									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa; Macon and Capron in Illinois; and Tekamah in Nebraska

Entry New GEM Code

22 GEMN-0309

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864202

Tester: MBS2655

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
34	Pioneer 31D58	232.5	113.1	20.4	11.5	57.8	6.6	0.0	269	131	49
28	BR51039:N1512-B-118/MBS2655	206.3	100.3	20.1	10.3	55.8	17.7	4.6	280	138	14
21	BR51039:N1512-B-053/MBS2655	204.6	99.5	19.6	10.6	56.5	16.9	5.6	280	129	12
32	Pioneer P0987	202.1	98.3	17.9	11.3	58.3	14.7	0.0	268	126	3
35	MBS2655/MBS9508	200.9	97.7	18.6	11.0	58.6	15.8	0.0	269	129	32
18	BR51039:N1512-B-038/MBS2655	200.5	97.5	19.6	10.4	57.3	18.1	0.0	278	138	5
24	BR51039:N1512-B-072/MBS2655	199.8	97.2	20.6	9.9	57.0	31.2	2.9	289	139	6
33	Pioneer P1151	197.9	96.3	18.3	10.9	57.5	2.8	0.0	260	114	1
30	BR51039:N1512-B-170/MBS2655	196.8	95.7	18.7	10.6	56.1	16.5	4.0	276	129	18
36	MBS3520/MBS8814	194.5	94.6	18.9	10.5	54.0	8.5	0.0	269	129	21
29	BR51039:N1512-B-137/MBS2655	193.7	94.2	20.1	9.8	56.5	32.1	7.3	283	138	10
4	((LH57/CML373)/GEMN-0155)-SIB-091-002/MBS2655	192.3	93.5	18.4	10.7	55.6	16.1	0.3	270	126	72
3	((LH57/CML373)/GEMN-0155)-SIB-049-002/MBS2655	192.1	93.4	19.6	9.9	56.0	25.2	1.6	280	138	1
22	BR51039:N1512-B-068/MBS2655	190.5	92.7	19.6	9.7	56.1	45.8	5.0	285	138	8
16	BR51039:N1512-B-018/MBS2655	190.3	92.6	18.6	10.4	57.6	13.5	0.7	276	133	27
23	BR51039:N1512-B-069/MBS2655	190.0	92.4	19.9	9.7	56.3	14.2	12.2	281	143	2
25	BR51039:N1512-B-079/MBS2655	189.1	92.0	20.0	9.5	56.3	19.7	2.3	294	141	14
2	((LH57/CML373)/GEMN-0155)-SIB-037-001/MBS2655	188.7	91.8	19.8	9.7	55.8	21.4	1.4	265	141	2
19	BR51039:N1512-B-048/MBS2655	186.2	90.6	18.7	10.0	57.2	21.2	0.0	284	144	23
20	BR51039:N1512-B-051/MBS2655	186.0	90.5	18.8	10.0	56.5	22.4	0.0	278	139	16
Number Locations		7		7	7	6	5	4	4	4	1
Mean		180.4		19.4	9.4	56.8	18.7	2.0	277	135	19
Non Check Mean		176.4		19.5	9.2	56.7	20.2	2.3	279	136	19
Check Means		205.6		18.8	11.0	57.2	9.7	0.0	267	126	21
CV		13.0		4.1	13.8	1.9	60.8	193.7	5.1	6.0	
Yield Range		138.1 - 232.5									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, Keota, and Mt. Pleasant in Iowa, and Macon in Illinois

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864203

Tester: MBS2655 & MBS3520

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
18	ATL100:N(LH82)(GEMN-0097)-151-002/MBS3520	227.9	113.2	18.2	12.7	56.1	11.5	7.8	283	133	0
38	Pioneer 31D58	220.6	109.5	20.1	11.3	57.1	7.2	7.1	290	135	38
15	ATL100:N(LH82)(GEMN-0097)-090-001/MBS3520	211.2	104.9	17.9	12.0	55.7	5.8	7.9	268	124	0
28	ATL100:N(LH82)(GEMN-0097)-290-001/MBS3520	208.4	103.5	18.1	11.6	54.9	10.2	13.4	291	133	18
30	ATL100:N(LH82)(GEMN-0097)-325-001/MBS3520	207.1	102.8	19.1	11.1	56.8	8.3	8.2	289	138	12
16	ATL100:N(LH82)(GEMN-0097)-121-001/MBS3520	198.7	98.7	18.6	10.8	54.7	6.3	18.2	291	131	1
37	Pioneer P1151	198.4	98.5	18.1	11.2	57.2	6.6	8.3	266	119	2
39	MBS2655/MBS9508	197.6	98.1	17.9	11.2	58.3	20.4	8.0	278	124	45
5	((LH57/CML373)/GEMN-0155)-SIB-049-002/MBS3520	197.3	98.0	19.3	10.5	55.7	16.5	0.0	271	131	0
25	ATL100:N(LH82)(GEMN-0097)-202-001/MBS3520	196.2	97.4	18.9	10.5	56.4	5.6	2.7	283	129	0
40	MBS3520/MBS8814	195.8	97.2	19.0	10.4	53.9	9.6	8.1	274	121	16
7	((LH57/CML373)/GEMN-0155)-SIB-098-001/MBS3520	195.4	97.0	17.4	11.4	55.4	8.9	2.2	280	126	16
17	ATL100:N(LH82)(GEMN-0097)-151-001/MBS3520	195.2	96.9	18.2	10.9	55.9	9.6	0.0	278	129	9
36	Pioneer P0987	194.5	96.6	18.1	10.9	58.9	5.6	8.8	279	125	1
23	ATL100:N(LH82)(GEMN-0097)-180-001/MBS3520	194.3	96.5	19.1	10.4	57.4	6.4	8.0	289	133	8
27	ATL100:N(LH82)(GEMN-0097)-230-001/MBS3520	193.4	96.0	18.4	10.7	54.6	9.4	5.7	279	126	10
21	ATL100:N(LH82)(GEMN-0097)-172-001/MBS3520	191.8	95.2	18.6	10.5	56.6	6.1	0.0	280	130	0
20	ATL100:N(LH82)(GEMN-0097)-169-001/MBS3520	191.5	95.1	19.7	9.8	56.8	5.7	10.5	288	131	20
26	ATL100:N(LH82)(GEMN-0097)-210-001/MBS3520	190.0	94.3	18.4	10.4	56.1	15.1	8.1	273	125	3
9	(3IIH6 /(GEMN-0173/KO679Y))-001-002/MBS3520	189.8	94.2	16.8	11.3	55.0	20.2	18.0	288	138	0
Number Locations		8		8	8	7	5	4	4	4	1
Mean		190.9		18.3	10.6	55.9	10.7	6.9	281	129	11
Non Check Mean		189.6		18.2	10.5	55.8	10.8	6.7	281	129	10
Check Means		201.4		18.6	11.0	57.1	9.9	8.1	277	125	20
CV		13.7		4.9	14.6	2.0	84.1	120.9	3.9	7.0	
Yield Range		168.1 - 227.9									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, Atlantic, Keota, Mt. Pleasant in Iowa, and Macon in Illinois

Entry New GEM Code

15 GEMN-0309

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864204

Tester: MBS5562

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
46	Pioneer 31D58	230.8	107.6	19.3	12.0	59.2	3.0	0.0	278	130	40
38	(GEMS-0162/GEMS-0227)-044-001/MBS5562	217.2	101.3	16.7	13.1	56.1	6.3	4.0	273	119	0
45	Pioneer P1151	214.3	99.9	18.0	12.0	58.0	2.9	2.9	260	104	0
48	MBS3520/MBS8814	214.2	99.9	18.3	11.8	54.8	12.2	0.0	270	125	18
15	(GEMS-0227/PHP38)-037-002/MBS5562	212.1	98.9	17.0	12.6	56.9	4.9	2.9	266	121	0
31	(GEMS-0162/GEMS-0227)-037-001/MBS5562	211.5	98.6	17.2	12.3	56.8	3.7	3.9	266	113	0
17	(GEMS-0162/GEMS-0227)-004-001/MBS5562	210.7	98.2	16.6	12.8	57.6	16.1	0.6	264	114	1
7	(GEMS-0227/PHP38)-018-001/MBS5562	209.2	97.5	16.9	12.4	57.4	6.7	0.0	265	109	0
18	(GEMS-0162/GEMS-0227)-004-002/MBS5562	208.3	97.1	17.6	12.0	58.2	6.5	5.7	266	123	0
39	(GEMS-0162/GEMS-0227)-045-001/MBS5562	208.1	97.0	16.8	12.5	57.0	5.1	6.3	266	115	0
47	MBS2655/MBS9508	207.7	96.8	17.5	11.9	58.6	12.7	10.4	268	115	32
40	(GEMS-0162/GEMS-0227)-045-002/MBS5562	205.9	96.0	16.8	12.3	57.3	6.4	3.3	259	115	0
6	(GEMS-0227/PHP38)-017-001/MBS5562	205.6	95.9	16.4	12.6	56.7	3.7	10.2	271	121	0
44	Pioneer P0987	205.5	95.8	17.7	11.6	58.9	14.0	0.0	268	123	3
13	(GEMS-0227/PHP38)-035-001/MBS5562	205.3	95.7	16.4	12.7	57.5	4.4	0.0	263	114	1
2	(GEMS-0227/PHP38)-009-001/MBS5562	204.8	95.5	16.8	12.3	57.5	11.4	16.7	270	119	0
8	(GEMS-0227/PHP38)-018-002/MBS5562	204.8	95.5	16.4	12.6	56.5	7.1	5.7	264	116	0
42	(GEMS-0162/GEMS-0227)-046-001/MBS5562	204.2	95.2	16.9	12.1	57.9	6.6	0.0	269	113	0
12	(GEMS-0227/PHP38)-030-002/MBS5562	203.2	94.7	16.8	12.1	58.0	6.3	2.9	260	110	0
36	(GEMS-0162/GEMS-0227)-042-001/MBS5562	202.2	94.3	17.2	11.8	58.6	5.2	2.4	255	109	0
Number Locations		8		8	8	7	6	3	4	4	1
Mean		200.9		17.0	11.9	57.4	6.5	3.8	263	116	3
Non Check Mean		199.3		16.8	11.9	57.4	6.2	3.9	263	115	1
Check Means		214.5		18.2	11.8	57.9	9.0	2.6	269	119	19
CV		8.8		3.8	8.9	1.4	116.1	154.8	5.9	7.0	
Yield Range		182.7 - 230.8									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, Atlantic, and Keota in Iowa; and Macon and Capron in Illinois

Entry New GEM Code

7 GEMS-0305

42 GEMS-0304

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864205

Tester: MBS5562

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
44	Pioneer P1151	232.7	106.8	18.7	12.5	58.1	2.8	2.1	250	97	0
45	Pioneer 31D58	228.2	104.7	20.2	11.3	58.6	5.3	7.2	268	118	19
21	(GEMS-0227/(GEMS-0162/PHP38))-011-001/MBS5562	221.3	101.6	17.0	13.0	57.8	7.3	6.7	263	115	0
43	Pioneer P0987	216.2	99.2	18.0	12.0	59.5	4.4	5.1	263	122	4
39	(GEMS-0227/(GEMS-0162/PHP38))-056-001/MBS5562	210.0	96.4	17.7	11.9	57.8	7.8	2.4	273	113	0
29	(GEMS-0227/(GEMS-0162/PHP38))-036-002/MBS5562	209.5	96.1	17.7	11.9	58.2	10.0	2.0	277	120	0
46	MBS2655/MBS9508	207.0	95.0	18.0	11.5	59.1	8.5	8.6	267	115	16
28	(GEMS-0227/(GEMS-0162/PHP38))-035-001/MBS5562	206.0	94.5	16.7	12.4	58.6	6.1	2.4	258	112	2
47	MBS3520/MBS8814	205.6	94.4	19.0	10.9	55.1	7.0	6.7	278	122	11
22	(GEMS-0227/(GEMS-0162/PHP38))-016-002/MBS5562	204.5	93.9	17.3	11.8	58.5	6.7	0.7	260	118	1
10	((DJ7/CML373)/GEMS-0162)-125-001/MBS5562	204.0	93.6	17.9	11.5	58.3	6.1	27.2	273	122	0
19	(GEMS-0227/(GEMS-0162/PHP38))-005-002/MBS5562	202.4	92.9	17.5	11.6	57.8	7.7	2.8	270	113	4
23	(GEMS-0227/(GEMS-0162/PHP38))-020-002/MBS5562	201.1	92.3	17.2	11.8	57.4	9.1	2.9	257	112	2
18	(GEMS-0227/(GEMS-0162/PHP38))-003-001/MBS5562	199.2	91.4	17.3	11.6	56.5	9.6	2.3	270	113	0
26	(GEMS-0227/(GEMS-0162/PHP38))-032-002/MBS5562	199.0	91.3	17.6	11.3	58.9	6.4	14.5	253	110	1
20	(GEMS-0227/(GEMS-0162/PHP38))-008-001/MBS5562	198.2	91.0	17.1	11.6	58.7	6.5	2.2	267	115	8
32	(GEMS-0227/(GEMS-0162/PHP38))-042-002/MBS5562	198.1	90.9	17.6	11.3	59.1	3.8	1.1	258	117	1
15	((DJ7/CML373)/GEMS-0162)-175-001/MBS5562	198.0	90.9	19.1	10.4	57.4	3.4	26.5	278	118	0
30	(GEMS-0227/(GEMS-0162/PHP38))-040-001/MBS5562	198.0	90.9	17.7	11.2	57.9	11.5	4.8	260	118	0
40	(GEMS-0227/(GEMS-0162/PHP38))-057-001/MBS5562	197.7	90.7	16.9	11.9	57.9	3.6	5.1	258	108	3
Number Locations		8		8	8	7	7	4	3	3	2
Mean		193.3		17.6	11.0	57.8	7.7	7.5	264	115	2
Non Check Mean		190.4		17.5	11.0	57.8	8.0	7.7	264	115	1
Check Means		217.9		18.8	11.7	58.1	5.6	5.9	265	115	10
CV		10.7		3.1	10.9	1.4	99.5	145.1	3.2	5.1	220.3
Yield Range		161.9 - 232.7									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa; Tekamah in Nebraska; and Capron and Geneseo in Illinois

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864206

Tester: MBS5562

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
47	MBS3520/MBS8814	219.2	103.9	18.3	12.1	54.6	2.9	7.6	273	119	41
44	Pioneer P1151	214.1	101.5	18.5	11.7	57.1	1.0	4.9	263	116	2
45	Pioneer 31D58	213.0	101.0	19.2	11.2	58.1	3.1	1.5	276	131	28
43	Pioneer P0987	208.3	98.8	18.0	11.7	59.0	7.0	3.3	263	126	0
4	((LH195/KO679Y)/GEMS-0227)-010-002/MBS5562	203.9	96.7	16.8	12.2	56.1	9.5	2.8	269	126	0
7	((LH195/KO679Y)/GEMS-0227)-017-002/MBS5562	202.5	96.0	17.6	11.6	57.2	5.8	4.3	271	131	0
8	((LH195/KO679Y)/GEMS-0227)-019-002/MBS5562	202.4	96.0	17.7	11.6	57.8	5.6	3.3	270	118	1
3	((LH195/KO679Y)/GEMS-0227)-010-001/MBS5562	201.6	95.6	17.6	11.5	57.1	7.1	5.9	278	131	0
46	MBS2655/MBS9508	199.8	94.7	17.8	11.4	57.8	7.5	4.8	261	116	1
5	((LH195/KO679Y)/GEMS-0227)-013-001/MBS5562	195.2	92.6	17.7	11.1	56.7	6.9	3.8	278	123	0
6	((LH195/KO679Y)/GEMS-0227)-017-001/MBS5562	194.3	92.1	17.7	11.3	57.6	3.9	5.5	269	124	0
15	(KO679Y/GEMS-0030)-018-001/MBS5562	187.6	89.0	18.2	10.6	56.4	18.3	9.2	266	119	0
30	BR51039:S(PHJ40)(GEMS-0147)-B-033/MBS5562	187.2	88.8	17.9	10.5	57.0	10.4	3.2	260	111	1
1	(GEMS-0115/CUBA164:T26aS41-B-040-B)-001-001/MBS5562	186.4	88.4	17.9	10.6	55.8	11.2	9.0	265	121	0
11	((LH195/KO679Y)/GEMS-0227)-031-001/MBS5562	186.3	88.3	16.5	11.4	56.5	12.3	4.4	255	116	0
36	BR51039:S(PHJ40)(GEMS-0147)-B-091/MBS5562	184.1	87.3	17.6	10.5	57.3	17.5	3.7	261	126	1
10	((LH195/KO679Y)/GEMS-0227)-027-001/MBS5562	182.8	86.7	17.2	10.9	56.7	2.4	0.0	263	116	0
24	(KO679Y/GEMS-0030)-115-001/MBS5562	182.1	86.3	17.9	10.4	57.2	14.7	4.6	258	119	0
2	((LH195/KO679Y)/GEMS-0227)-009-001/MBS5562	180.7	85.7	17.0	10.7	56.1	12.0	5.9	269	120	0
29	BR51039:S(PHJ40)(GEMS-0147)-B-026/MBS5562	180.3	85.5	17.6	10.3	57.7	7.6	4.5	264	121	0
Number Locations		8		8	8	7	7	4	4	4	1
Mean		181.4		17.8	10.3	57.1	11.4	5.1	265	122	2
Non Check Mean		178.0		17.7	10.2	57.0	12.3	5.2	264	122	0
Check Means		210.9		18.4	11.6	57.3	4.3	4.4	267	122	14
CV		11.7		4.2	12.3	1.7	82.9	116.2	3.4	6.3	
Yield Range		151.0 - 219.2									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, Atlantic, Keota, and Mt. Pleasant in Iowa, and St. Joe in Missouri

Entry New GEM Code

3 GEMS-0306

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864207

Tester: MBS8731

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
31	(GEMS-0115/CUBA164:T26aS41-B-040-B)-001-004/MBS8731	221.3	110.7	18.6	12.1	56.4	5.2	6.8	270	127	21
58	Pioneer 31D58	220.2	110.2	19.0	11.9	57.6	7.2	2.7	288	142	23
46	(GEMS-0115/CUBA164:T26aS41-B-040-B)-020-004/MBS8731	216.4	108.3	18.7	11.7	56.0	7.5	3.3	283	138	42
47	(GEMS-0115/CUBA164:T26aS41-B-040-B)-021-004/MBS8731	213.4	106.8	18.8	11.5	54.7	6.2	3.1	270	125	36
42	(GEMS-0115/CUBA164:T26aS41-B-040-B)-015-004/MBS8731	212.5	106.3	18.5	11.6	56.3	4.1	6.3	282	130	32
37	(GEMS-0115/CUBA164:T26aS41-B-040-B)-007-001/MBS8731	212.1	106.1	19.0	11.2	55.9	5.2	6.2	283	127	17
19	(GEMS-0227/(Mp494/GEMS-0002)-001-002-001-001)-SIB-059-001/MBS8731	209.6	104.9	18.9	11.3	54.5	4.7	6.5	275	115	2
41	(GEMS-0115/CUBA164:T26aS41-B-040-B)-014-003/MBS8731	208.9	104.5	18.8	11.4	54.8	6.3	0.9	282	132	12
35	(GEMS-0115/CUBA164:T26aS41-B-040-B)-005-004/MBS8731	208.7	104.4	19.5	10.9	55.1	4.6	5.5	280	130	51
57	Pioneer P1151	208.6	104.4	17.5	12.1	57.1	1.6	0.0	252	108	3
50	(GEMS-0115/CUBA164:T26aS41-B-040-B)-023-004/MBS8731	207.6	103.9	18.8	11.2	54.9	7.3	6.7	275	123	11
48	(GEMS-0115/CUBA164:T26aS41-B-040-B)-023-002/MBS8731	207.1	103.6	19.2	10.9	56.2	5.8	17.7	287	132	9
51	(GEMS-0115/CUBA164:T26aS41-B-040-B)-029-002/MBS8731	207.1	103.6	18.8	11.1	56.6	16.0	21.1	282	142	37
28	DKXL380:S08b(GEMS-0163)-SIB-037-001/MBS8731	204.6	102.4	17.5	11.9	54.2	18.6	19.1	283	132	25
40	(GEMS-0115/CUBA164:T26aS41-B-040-B)-012-002/MBS8731	204.5	102.3	18.1	11.4	55.4	6.5	6.1	268	128	48
32	(GEMS-0115/CUBA164:T26aS41-B-040-B)-003-001/MBS8731	204.4	102.3	19.1	10.8	56.3	6.4	0.0	280	133	57
38	(GEMS-0115/CUBA164:T26aS41-B-040-B)-008-002/MBS8731	203.4	101.8	18.0	11.4	56.5	3.4	2.9	267	125	18
12	((PHB47/CML373)/GEMS-0162)-SIB-112-002/MBS8731	202.6	101.4	19.9	10.3	55.2	5.5	0.0	268	127	45
33	(GEMS-0115/CUBA164:T26aS41-B-040-B)-004-001/MBS8731	202.5	101.3	18.1	11.3	55.5	8.8	28.5	278	142	28
39	(GEMS-0115/CUBA164:T26aS41-B-040-B)-008-004/MBS8731	202.3	101.2	19.0	10.8	54.9	7.0	6.9	272	127	34
Number Locations		7		7	7	6	5	3	3	3	1
Mean		197.8		18.6	10.8	55.8	7.8	4.2	271	126	26
Non Check Mean		197.6		18.7	10.7	55.7	7.6	4.2	272	126	27
Check Means		199.9		17.7	11.4	57.1	9.9	3.8	269	125	13
CV		8.6		3.5	9.5	1.5	109.9	218.0	3.7	5.3	
Yield Range		178.4 - 221.3									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, and Carroll in Iowa; Elberfeld and Oaktown in Indiana; and Jackson in Tennessee

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864208

Tester: MBS8731

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
56	Pioneer 31D58	223.8	109.9	18.8	11.8	58.1	5.7	0.0	277	132	42
17	(GEMS-0227/(GEMS-0162/PHP38))-055-002/MBS8731	222.6	109.3	17.5	12.7	54.4	8.8	0.0	273	118	6
4	(GEMS-0227/(GEMS-0162/PHP38))-020-002/MBS8731	215.7	105.9	18.0	12.0	55.1	3.0	0.0	252	108	8
36	(GEMS-0227/(GEMS-0162/PHP38))-008-001/MBS8731	211.6	103.9	18.3	11.6	56.4	5.5	0.5	278	115	12
11	(GEMS-0227/(GEMS-0162/PHP38))-040-001/MBS8731	210.7	103.5	18.9	11.2	56.0	9.8	0.5	273	125	7
27	(GEMS-0227/PHP38)-018-001/MBS8731	209.9	103.1	17.7	11.9	56.1	7.7	0.0	268	122	2
55	Pioneer P1151	209.8	103.0	17.9	11.7	57.6	7.3	0.0	258	113	4
29	(GEMS-0227/PHP38)-023-001/MBS8731	208.6	102.5	18.2	11.4	56.3	3.0	1.4	277	127	4
26	(GEMS-0227/PHP38)-017-001/MBS8731	205.0	100.7	17.6	11.7	54.8	4.0	3.2	253	113	23
38	(GEMS-0227/(GEMS-0162/PHP38))-047-001/MBS8731	204.8	100.6	18.5	11.0	55.8	5.1	0.0	272	120	5
28	(GEMS-0227/PHP38)-018-002/MBS8731	204.3	100.3	17.3	11.8	55.1	14.2	0.0	268	117	4
18	(GEMS-0227/(GEMS-0162/PHP38))-056-001/MBS8731	203.9	100.1	19.5	10.5	55.4	3.8	5.4	267	120	15
2	(GEMS-0227/(GEMS-0162/PHP38))-011-001/MBS8731	203.2	99.8	18.2	11.2	56.0	8.0	0.0	267	115	7
35	(GEMS-0227/PHP38)-037-002/MBS8731	202.5	99.5	18.0	11.3	56.2	2.6	0.0	265	110	14
1	(GEMS-0227/(GEMS-0162/PHP38))-005-002/MBS8731	202.4	99.4	18.4	11.0	55.2	8.9	0.0	280	130	17
3	(GEMS-0227/(GEMS-0162/PHP38))-016-002/MBS8731	201.5	99.0	19.1	10.5	55.4	3.3	0.0	258	117	9
13	(GEMS-0227/(GEMS-0162/PHP38))-046-001/MBS8731	200.4	98.4	19.2	10.4	55.1	3.6	0.0	267	118	25
30	(GEMS-0227/PHP38)-025-001/MBS8731	200.1	98.3	18.4	10.9	56.1	1.6	0.0	272	122	8
12	(GEMS-0227/(GEMS-0162/PHP38))-042-002/MBS8731	200.0	98.2	18.7	10.7	57.2	0.3	0.0	268	115	20
33	(GEMS-0227/PHP38)-035-001/MBS8731	200.0	98.2	17.8	11.2	56.8	6.5	0.0	255	105	14
Number Locations		8		8	8	6	5	3	3	3	1
Mean		194.4		18.1	10.7	56.2	6.3	1.5	266	117	16
Non Check Mean		193.5		18.2	10.6	56.1	6.2	1.3	266	117	15
Check Means		203.6		17.8	11.4	57.3	7.9	3.1	267	121	21
CV		10.7		3.7	11.3	1.3	83.9	246.1	3.5	5.5	
Yield Range		151.9 - 223.8									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa; and Ridgeway, Macon, and Geneseo in Illinois

Entry New GEM Code

27 GEMS-0305

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864209

Tester: MBS8731

		All Location Means									
		Yield	% Yield	%	Yield/		Late %	Plant	Ear	Green	
Entry	Pedigree	B/A	/CHK	Moist	Moist	TWT	% S.L.	R.L.	Height	Height	Snap (count)
24	(GEMS-0162/GEMS-0227)-008-001/MBS8731	220.6	110.7	18.8	12.0	56.5	8.7	5.4	263	117	3
10	(GEMS-0162/PHP38)-010-001/MBS8731	217.7	109.3	20.0	11.0	55.9	1.5	0.5	255	112	7
26	(GEMS-0162/GEMS-0227)-015-003/MBS8731	217.3	109.1	17.5	12.6	55.3	6.8	0.0	265	105	39
5	BR51039:S(4676A)(GEMS-0162)-SIB-114-001/MBS8731	213.3	107.1	19.2	11.2	55.1	6.9	7.1	273	117	4
16	(GEMS-0162/PHP38)-027-002/MBS8731	211.1	106.0	18.8	11.4	56.9	4.0	1.9	267	122	3
17	(GEMS-0162/PHP38)-027-004/MBS8731	210.3	105.6	19.4	11.0	56.5	4.5	2.6	260	113	4
30	(GEMS-0162/GEMS-0227)-030-001/MBS8731	208.9	104.9	17.6	12.1	54.7	20.4	0.0	278	130	1
34	(GEMS-0162/GEMS-0227)-039-001/MBS8731	206.2	103.5	19.7	10.6	55.6	3.7	0.0	260	120	11
21	(GEMS-0162/GEMS-0227)-001-002/MBS8731	205.5	103.2	18.5	11.3	56.4	2.5	0.5	267	115	25
15	(GEMS-0162/PHP38)-023-003/MBS8731	205.4	103.1	18.6	11.2	57.5	6.0	2.8	267	118	2
46	Pioneer 31D58	205.4	103.1	18.9	11.0	58.2	3.5	5.1	282	130	41
45	Pioneer P1151	204.6	102.7	17.8	11.7	57.6	3.7	1.4	255	108	1
1	BR51039:S(4676A)(GEMS-0162)-SIB-018-001/MBS8731	204.2	102.5	17.7	11.7	53.5	6.6	7.4	265	122	8
13	(GEMS-0162/PHP38)-022-002/MBS8731	203.9	102.4	18.8	11.0	54.6	4.7	0.0	267	117	20
38	(GEMS-0162/GEMS-0227)-043-001/MBS8731	202.4	101.6	19.2	10.8	54.5	5.8	1.3	263	118	0
11	(GEMS-0162/PHP38)-010-004/MBS8731	202.3	101.6	20.1	10.2	56.6	7.9	3.6	272	117	33
44	Pioneer P0987	200.9	100.9	17.1	11.9	58.3	5.1	3.3	257	120	0
7	(GEMS-0162/PHP38)-004-003/MBS8731	200.5	100.7	18.9	10.8	56.4	5.0	0.0	268	122	12
22	(GEMS-0162/GEMS-0227)-004-001/MBS8731	200.4	100.6	17.9	11.3	56.1	10.1	0.0	262	117	14
35	(GEMS-0162/GEMS-0227)-040-001/MBS8731	200.4	100.6	17.8	11.4	55.9	5.8	3.0	275	120	2
Number Locations		8		8	8	6	5	3	3	3	1
Mean		198.1		18.4	10.9	56.1	6.2	1.5	264	116	11
Non Check Mean		198.0		18.5	10.9	56.0	6.3	1.4	264	116	11
Check Means		199.2		17.7	11.4	57.0	4.9	2.1	267	120	15
CV		10.4		3.0	10.9	1.4	103.0	271.8	3.3	4.9	
Yield Range		178.2 - 220.6									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa; Elberfeld and Oaktown in Indiana; and Jackson in Tennessee

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864210

Tester: MBS8731

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
34	Pioneer 31D58	231.9	112.8	18.6	12.4	57.6	2.6	0.0	280	133	29
4	(GEMS-0227/(LH195/KO679Y))-012-002/MBS8731	211.9	103.1	17.0	12.5	53.5	7.9	3.0	277	120	8
2	(GEMS-0227/(LH195/KO679Y))-011-002/MBS8731	211.1	102.7	17.4	12.2	55.3	2.9	8.1	260	110	18
6	(GEMS-0227/(LH195/KO679Y))-018-002/MBS8731	209.5	101.9	17.7	11.9	54.4	3.8	2.3	257	108	9
1	(GEMS-0227/(LH195/KO679Y))-007-001/MBS8731	206.6	100.5	18.4	11.3	54.0	3.6	2.7	265	120	24
9	(GEMS-0227/(LH195/KO679Y))-038-001/MBS8731	205.5	100.0	19.9	10.3	55.4	5.5	3.1	265	118	21
8	(GEMS-0227/(LH195/KO679Y))-029-002/MBS8731	204.7	99.6	18.1	11.4	54.8	3.5	3.2	268	118	3
31	(KO679Y/GEMS-0030)-164-001/MBS8731	204.5	99.5	18.8	10.9	55.1	16.5	7.7	270	130	4
33	Pioneer P1151	204.0	99.3	17.1	11.9	56.5	3.4	1.1	252	105	6
22	(KO679Y/GEMS-0030)-110-001/MBS8731	203.0	98.8	19.3	10.6	53.5	15.1	6.3	255	123	8
10	(GEMS-0227/(LH195/KO679Y))-039-001/MBS8731	202.8	98.7	17.9	11.3	55.7	12.1	4.0	278	125	20
18	(KO679Y/GEMS-0030)-055-001/MBS8731	202.0	98.3	17.6	11.5	55.1	11.6	3.9	263	127	10
5	(GEMS-0227/(LH195/KO679Y))-018-001/MBS8731	200.8	97.7	17.0	11.8	53.8	11.0	1.9	253	110	0
12	(KO679Y/GEMS-0030)-003-001/MBS8731	200.3	97.5	19.0	10.6	55.4	3.9	10.2	275	138	2
36	MBS3520/MBS8814	198.0	96.4	17.6	11.2	52.6	3.0	4.6	273	120	18
35	MBS2655/MBS9508	197.2	96.0	16.9	11.7	57.2	10.1	4.1	270	122	15
7	(GEMS-0227/(LH195/KO679Y))-019-001/MBS8731	196.3	95.5	17.5	11.2	54.3	13.1	0.0	265	125	14
32	Pioneer P0987	196.3	95.5	16.8	11.7	58.5	3.8	3.4	262	127	1
13	(KO679Y/GEMS-0030)-015-001/MBS8731	194.1	94.5	18.0	10.8	54.3	23.6	5.3	283	133	
29	(KO679Y/GEMS-0030)-157-001/MBS8731	193.4	94.1	18.5	10.5	55.0	5.1	4.1	263	123	0
Number Locations		8		8	8	5	6	4	3	3	1
Mean		195.8		18.2	10.8	54.9	10.6	5.0	266	124	13
Non Check Mean		194.2		18.3	10.7	54.6	11.5	5.4	265	124	13
Check Means		205.5		17.4	11.8	56.5	4.6	2.6	267	121	14
CV		11.5		3.6	12.6	1.4	88.2	151.5	3.1	5.0	
Yield Range		171.1 - 231.9									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa; Ridgeway and Geneseo in Illinois; and Farmersburg in Indiana

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864211

Tester: MBS9451

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
12	((DJ7/CML373)/GEMS-0162)-145-002/MBS9451	212.5	108.0	21.3	10.3	54.9	2.5	13.1	280	130	2
44	Pioneer 31D58	212.0	107.8	20.3	10.5	58.3	8.5	5.7	277	132	21
43	Pioneer P1151	210.0	106.8	19.2	11.0	57.2	0.8	0.0	260	110	0
18	((DJ7/CML373)/GEMS-0162)-223-001/MBS9451	206.5	105.0	19.6	10.7	55.6	7.3	5.9	288	137	1
16	((DJ7/CML373)/GEMS-0162)-175-001/MBS9451	204.7	104.1	22.3	9.5	55.4	4.4	10.8	283	135	1
4	((DJ7/CML373)/GEMS-0162)-035-002/MBS9451	200.5	101.9	19.7	10.3	55.3	3.5	13.5	268	127	9
11	((DJ7/CML373)/GEMS-0162)-125-001/MBS9451	200.3	101.8	19.8	10.3	56.8	3.7	6.8	293	135	1
2	((DJ7/CML373)/GEMS-0162)-032-001/MBS9451	196.7	100.0	21.0	9.5	56.0	4.6	17.4	290	140	5
40	DKXL380:S08b(GEMS-0163)-SIB-037-001/MBS9451	196.3	99.8	18.7	10.6	54.8	6.5	4.2	287	132	11
3	((DJ7/CML373)/GEMS-0162)-035-001/MBS9451	196.2	99.7	19.6	10.1	55.8	8.3	8.3	280	138	2
8	((DJ7/CML373)/GEMS-0162)-079-001/MBS9451	195.1	99.2	19.6	10.0	56.5	6.8	2.1	275	125	2
9	((DJ7/CML373)/GEMS-0162)-099-001/MBS9451	192.7	98.0	19.3	10.1	57.7	2.0	5.3	278	128	2
7	((DJ7/CML373)/GEMS-0162)-071-002/MBS9451	192.6	97.9	20.7	9.5	55.0	1.1	4.9	277	123	9
42	Pioneer P0987	192.1	97.7	18.5	10.4	58.8	3.9	4.7	265	125	3
46	MBS3520/MBS8814	191.6	97.4	19.2	10.0	54.2	3.9	0.4	268	125	25
13	((DJ7/CML373)/GEMS-0162)-146-002/MBS9451	191.5	97.4	19.0	10.1	57.6	9.0	17.9	272	125	3
30	((PHB47/CML373)/GEMS-0162)-SIB-117-001/MBS9451	191.4	97.3	20.4	9.6	55.9	2.1	18.3	278	127	6
27	((PHB47/CML373)/GEMS-0162)-SIB-086-001/MBS9451	190.2	96.7	20.2	9.6	56.8	0.9	5.3	267	123	3
24	((PHB47/CML373)/GEMS-0162)-SIB-053-002/MBS9451	186.6	94.9	20.3	9.3	55.7	3.9	9.3	280	127	0
6	((DJ7/CML373)/GEMS-0162)-049-001/MBS9451	186.1	94.6	20.0	9.4	56.2	2.0	8.6	280	135	1
Number Locations		7		7	7	5	5	4	3	3	2
Mean		186.4		19.7	9.6	56.3	4.9	6.5	275	126	6
Non Check Mean		185.2		19.8	9.5	56.1	4.9	7.0	276	127	5
Check Means		196.7		19.2	10.3	57.3	5.5	2.5	268	123	13
CV		11.2		3.5	12.2	1.4	91.4	149.4	3.4	5.6	132.6
Yield Range		161.6 - 216.3									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, Atlantic, and Mt. Pleasant in Iowa, and Tekamah in Nebraska

Entry New GEM Code

24 GEMS-0307

27 GEMS-0308

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864212

Tester: MBS9451

		All Location Means									
<i>Entry</i>	<i>Pedigree</i>	<i>Yield B/A</i>	<i>% Yield /CHK</i>	<i>% Moist</i>	<i>Yield/ Moist</i>	<i>TWT</i>	<i>% S.L.</i>	<i>Late % R.L.</i>	<i>Plant Height</i>	<i>Ear Height</i>	<i>Green Snap (count)</i>
42	Pioneer 31D58	226.1	110.3	19.4	11.7	58.4	3.8	2.4	273	123	24.5
18	(GEMS-0115/CUBA164:T26aS41-B-040-B)-021-004/MBS9451	212.5	103.7	18.4	11.6	57.4	10.6	0.0	260	115	0.5
41	Pioneer P1151	211.3	103.1	17.8	12.0	57.8	2.2	0.5	250	107	0.0
21	(GEMS-0115/CUBA164:T26aS41-B-040-B)-023-004/MBS9451	208.7	101.8	17.9	11.8	55.8	8.8	21.5	272	127	0.0
40	Pioneer P0987	206.8	100.9	17.3	12.0	59.1	5.6	15.1	258	118	3.0
19	(GEMS-0115/CUBA164:T26aS41-B-040-B)-023-002/MBS9451	206.2	100.6	18.6	11.2	56.6	5.6	6.2	272	123	3.0
14	(GEMS-0115/CUBA164:T26aS41-B-040-B)-016-002/MBS9451	205.4	100.2	17.4	11.8	56.0	7.0	0.5	263	123	3.5
13	(GEMS-0115/CUBA164:T26aS41-B-040-B)-015-004/MBS9451	204.6	99.8	17.8	11.6	56.2	1.7	4.2	273	125	3.5
22	(GEMS-0115/CUBA164:T26aS41-B-040-B)-029-002/MBS9451	204.5	99.8	18.6	11.1	55.8	3.0	11.4	277	127	3.5
39	(GEMS-0162/PHP38)-034-004/MBS9451	203.1	99.1	17.8	11.6	56.5	5.8	0.0	280	130	0.0
31	(GEMS-0162/PHP38)-017-002/MBS9451	202.0	98.5	18.4	11.0	57.6	3.7	5.3	280	123	5.0
24	(GEMS-0162/PHP38)-003-002/MBS9451	200.0	97.6	18.8	10.7	56.6	1.8	1.3	273	118	3.5
6	(GEMS-0115/CUBA164:T26aS41-B-040-B)-005-004/MBS9451	199.9	97.5	19.2	10.5	55.2	5.1	12.1	278	132	5.5
36	(GEMS-0162/PHP38)-027-004/MBS9451	199.7	97.4	18.6	10.8	57.0	2.8	1.9	282	127	0.5
43	MBS2655/MBS9508	199.6	97.4	17.6	11.4	58.3	10.7	3.3	268	118	18.5
35	(GEMS-0162/PHP38)-027-002/MBS9451	199.4	97.3	18.3	11.0	57.7	2.5	3.1	280	127	1.5
16	(GEMS-0115/CUBA164:T26aS41-B-040-B)-020-003/MBS9451	198.5	96.8	18.5	10.8	55.3	4.0	4.1	275	130	1.0
8	(GEMS-0115/CUBA164:T26aS41-B-040-B)-007-001/MBS9451	198.3	96.7	18.8	10.7	56.0	5.9	12.8	277	123	2.5
28	(GEMS-0162/PHP38)-010-001/MBS9451	198.3	96.7	19.9	10.1	55.5	3.9	1.0	268	117	7.5
34	(GEMS-0162/PHP38)-023-003/MBS9451	198.0	96.6	18.5	10.9	57.1	2.2	0.0	270	120	2.5
Number Locations		8		8	8	6	6	3	3	3	2
Mean		196.3		18.2	10.9	56.3	4.9	5.0	272	121	5
Non Check Mean		195.3		18.2	10.8	56.1	4.8	5.1	273	122	3
Check Means		205.0		18.1	11.4	57.6	5.1	4.2	264	116	18
CV		10.6		3.1	11.0	1.3	109.9	139.4	3.2	5.3	147.2
Yield Range		177.7 - 226.1									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Atlantic in Iowa; Macon and Geneseo in Illinois; and Tekamah in Nebraska

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864213

Tester: MBS9451

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
9	(GEMS-0227/(Mp494/GEMS-0002)-001-002-001-001)-SIB-138-001/MBS9451	210.4	103.4	17.4	12.2	53.2	6.8	5.4	270	115	3
21	(GEMS-0227/(LH195/KO679Y))-039-001/MBS9451	208.7	102.6	17.9	12.0	54.3	5.0	4.6	283	123	2
33	Pioneer P1151	207.2	101.8	18.6	11.4	56.9	2.3	0.0	252	107	0
34	Pioneer 31D58	206.9	101.7	20.0	10.6	56.8	4.3	0.0	283	137	46
36	MBS3520/MBS8814	206.1	101.3	19.0	11.1	52.8	5.5	5.0	275	118	23
2	(GEMS-0227/(Mp494/GEMS-0002)-001-002-001-001)-SIB-014-001/MBS9451	205.1	100.8	17.7	11.7	53.2	9.7	3.2	285	122	8
15	(GEMS-0227/(LH195/KO679Y))-012-002/MBS9451	203.0	99.8	17.5	11.8	53.5	6.9	12.0	288	130	1
28	((LH195/KO679Y)/GEMS-0227)-019-002/MBS9451	203.0	99.8	19.1	11.0	55.5	7.5	0.8	280	123	0
32	Pioneer P0987	202.8	99.7	18.2	11.5	58.4	4.5	2.8	263	120	0
24	((LH195/KO679Y)/GEMS-0227)-010-002/MBS9451	199.0	97.8	18.1	11.3	53.4	7.8	0.0	282	125	1
26	((LH195/KO679Y)/GEMS-0227)-017-001/MBS9451	198.1	97.3	17.9	11.2	55.8	4.6	2.2	282	127	0
13	(GEMS-0227/(LH195/KO679Y))-011-002/MBS9451	198.0	97.3	18.2	11.1	55.0	5.2	9.9	278	117	2
29	((LH195/KO679Y)/GEMS-0227)-022-001/MBS9451	197.1	96.9	18.9	10.6	54.5	9.7	8.8	283	123	13
7	(GEMS-0227/(Mp494/GEMS-0002)-001-002-001-001)-SIB-131-001/MBS9451	196.7	96.7	17.2	11.7	54.1	8.7	7.8	280	118	4
10	(GEMS-0227/(Mp717/GEMS-0002)-001-001-001-001)-SIB-025-001/MBS9451	194.6	95.6	17.5	11.4	56.7	4.9	5.5	280	127	12
35	MBS2655/MBS9508	194.5	95.6	18.1	10.8	57.4	6.6	19.2	275	125	29
30	((LH195/KO679Y)/GEMS-0227)-027-001/MBS9451	194.3	95.5	18.5	10.7	54.5	3.3	2.1	280	113	0
3	(GEMS-0227/(Mp494/GEMS-0002)-001-002-001-001)-SIB-059-001/MBS9451	194.1	95.4	19.2	10.2	52.4	12.5	9.7	285	133	0
11	(GEMS-0227/(Mp717/GEMS-0002)-001-001-001-001)-SIB-053-001/MBS9451	194.1	95.4	16.8	11.7	55.0	11.7	8.2	290	133	1
23	((LH195/KO679Y)/GEMS-0227)-010-001/MBS9451	194.0	95.3	18.6	10.6	54.5	3.7	3.5	280	130	0
Number Locations		8		8	8	5	6	4	3	3	1
Mean		194.4		18.2	10.9	54.6	6.5	5.2	278	122	5
Non Check Mean		192.9		18.1	10.9	54.3	6.8	5.1	279	122	2
Check Means		203.5		18.8	11.1	56.5	4.6	5.4	270	121	20
CV		9.8		3.5	10.5	1.3	78.8	153.6	3.2	6.1	
Yield Range		176.3 - 210.4									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, Atlantic, and Mt. Pleasant in Iowa; Macon in Illinois; and Farmersburg in Indiana

Entry New GEM Code

23 GEMS-0306

2018 GEM Ames Yield Trial Top Twenty Entries

Experiment: GEM1864214

Tester: MBS3520

		All Location Means									
Entry	Pedigree	Yield B/A	% Yield /CHK	% Moist	Yield/ Moist	TWT	% S.L.	Late % R.L.	Plant Height	Ear Height	Green Snap (count)
34	Pioneer 31D58	222.8	108.3	21.2	10.8	58.4	8.5	0.0	278	130	18.5
24	BR51039:N1512-B-072/MBS3520	220.0	107.0	20.7	10.8	56.8	8.5	0.8	277	123	3.5
3	ATL100:N(LH82)(GEMN-0097)-172-001/MBS3520	217.6	105.8	19.4	11.3	57.1	10.3	2.3	273	125	2.5
33	Pioneer P1151	211.7	102.9	19.3	11.1	57.6	2.0	0.3	257	115	1.0
30	BR51039:N1512-B-170/MBS3520	208.3	101.3	19.7	10.7	54.0	6.4	3.5	257	115	16.5
23	BR51039:N1512-B-069/MBS3520	207.2	100.7	19.8	10.7	56.1	11.3	11.7	272	135	19.0
22	BR51039:N1512-B-068/MBS3520	206.2	100.2	20.2	10.4	55.2	16.2	12.0	268	135	5.0
32	Pioneer P0987	204.8	99.6	18.7	11.1	58.7	5.5	7.1	248	120	1.0
31	BR51039:N1512-B-172/MBS3520	204.4	99.4	19.0	10.8	53.3	4.1	0.0	255	112	26.5
9	TZAR104:N(LH61)(ANTIG03:N1242-B-007-B)-B-020/MBS3520	202.5	98.4	21.2	9.7	58.6	3.1	0.3	267	120	21.0
17	BR51039:N1512-B-036/MBS3520	202.1	98.2	19.7	10.4	56.2	14.9	2.4	267	123	7.0
20	BR51039:N1512-B-051/MBS3520	201.1	97.8	19.9	10.3	53.1	6.7	2.2	263	123	22.0
2	ATL100:N(LH82)(GEMN-0097)-087-001/MBS3520	201.0	97.7	20.5	9.9	57.3	11.1	0.0	262	123	3.5
21	BR51039:N1512-B-053/MBS3520	200.5	97.5	20.4	10.0	56.5	8.3	6.7	273	122	13.0
28	BR51039:N1512-B-118/MBS3520	196.4	95.5	20.4	9.9	56.0	14.0	5.3	285	132	5.5
35	MBS2655/MBS9508	196.2	95.4	18.5	10.7	58.5	14.4	0.0	260	120	4.0
4	(GEMN-0192/MSU 1)-SIB-009-001/MBS3520	196.0	95.3	20.2	9.9	54.7	12.0	2.4	275	138	19.5
36	MBS3520/MBS8814	193.2	93.9	19.3	10.1	54.1	7.0	2.2	263	122	23.0
26	BR51039:N1512-B-083/MBS3520	188.4	91.6	18.3	10.4	57.1	6.2	2.0	277	133	48.5
18	BR51039:N1512-B-038/MBS3520	188.0	91.4	19.9	9.6	57.5	4.3	1.0	275	135	15.5
Number Locations		6		6	6	5	5	4	3	3	2
Mean		182.1		19.7	9.4	56.5	10.3	4.2	266	126	15
Non Check Mean		178.3		19.7	9.2	56.3	10.7	4.5	267	126	16
Check Means		205.7		19.4	10.8	57.4	7.5	1.9	261	121	10
CV		13.1		4.8	14.4	1.7	91.8	157.1	4.0	5.2	57.8
Yield Range		118.3 - 222.8									

* All trial data will be posted on the website

** Locations: Ames, Crawfordsville, Keystone, Carroll, and Mt. Pleasant in Iowa, and Tekamah in Nebraska

