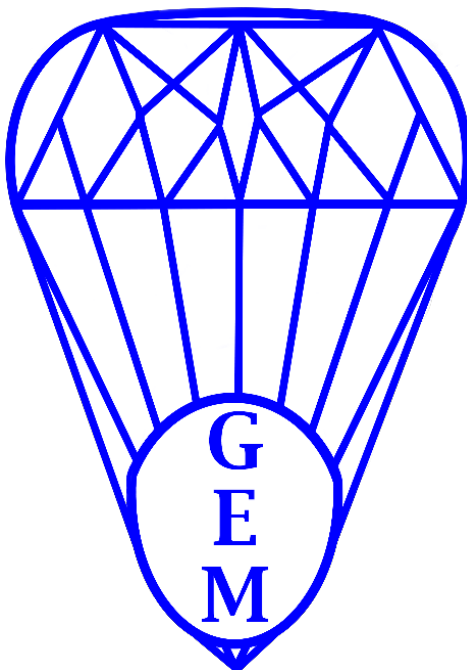


United States Department of Agriculture

Agricultural Research Service



Germplasm Enhancement of Maize

2023 GEM Cooperator Handout

December 5, 2023

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.

Germplasm Enhancement of Maize

Mission Statement:

The mission of 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 un-adapted germplasm. This contributes to the global sustainability of agricultural production, economic stability, and the nutrition and well-being of society.

2023 GEM Cooperator Meeting Booklet

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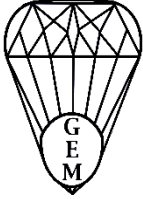
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**Germplasm
Enhancement of
Maize**

Cooperator Meeting

Date: Tuesday, December 5, 2023

Time: 13:30 to 17:00 EST

Place: Hyatt Regency Orlando

Room: Celebration 6

Virtual: Zoom Meeting

<https://www.zoomgov.com/j/1606903082?pwd=TVpYbGNRclQ0T2dONXlzd3BVUDgrQT09>

Meeting called by: J. Parks, Chair

Note taker: S. Swarm

Agenda Topics

Call to Order and Welcome	J. Parks	13:30 – 13:35
Minutes of 7 December 2022	J. Parks	13:35 – 13:40
TSG Election Updates	Lead by J. Parks	13:40 – 14:25
Annual Reports and Program Updates	M. Krakowsky, A. Vanous	14: 25 – 14:50
New Conventional Releases	M. Krakowsky, A. Vanous	14:50 – 15:10
In-Kind Support Summary	M. Krakowsky, A. Vanous	15:10 – 15:20
GEM Website	D. Peters	15:20 – 15:30
Adjourn		~15:30

Minutes

Cooperator Meeting – 7 December 2022

Note taker: Stephen Swarm

1. Walter Trevisan called meeting to order at 8:30 AM CST. Walter announced he is stepping down from roll and introduced new TSG chair, Jim Parks, and meeting was handed over to Jim. Minutes for the December 16, 2021 meeting were presented for approval. Walter moved to accept the minutes and Mitchell Shumann seconded the motion to approve. Chris Eichhorn agreed to serve a second term on the TSG representing Wyffels.
2. New Releases
 - a. Four new releases from Ames:
 - i. GEMS-0326: GEMS-0220/CML373//R3212Z-069-002-001-B
 - ii. GEMS-0327: GEMS-0227/CML373//R3212Z-087-002-001-B
 - iii. GEMS-0328: GEMS-0227/Ki14//GEMS-0218-040-001-001-B
 - iv. GEMS-0329: GEMS-0227/Ki14//PHW51-005-001-001-B
3. Program Updates
 - a. Ames—Adam Vanous
 - i. Adam introduced Ames staff members, which is now fully staffed. With pandemic restrictions at the start of 2022 and difficulty obtaining sufficient labor, the nursery was smaller than usual (60-70% of normal). Nurseries were summarized as ~5500 rows pollinated, 2364 observation rows, and 5424 ICB rows. Yield testing included 14354 plots, which was 20% smaller than normal due to 2021 covid restrictions.
 - ii. For the winter 2022/23 season, 500 rows were sent to Mexico for 250 crosses, and 200 rows to Hawaii for 100 crosses (total 350 breeding crosses). Jianming Yu will assist with identifying best breeding crosses to use from Bayer Lines using genotype information.
 - b. Raleigh—Matt
 - i. No new releases due to smaller nurseries and change in tester strategy.
 - ii. For the 2022 season, the nursery contained 1800 rows and 2100 isolation rows were grown with Gro Alliance and Hawaii Seed Pro. The nursery returns suffered due to hot and dry weather in North Carolina.
 - iii. For yield testing, about 8000 plots were grown at 7 North Carolina locations, plus 13 locations from 2 public and 3 private cooperators. A summary of trial composition with size and testers is provided in the annual report. For 2023, Matt plans to use approximately 10,000 plots at 9-10 NC locations.
 - iv. The Raleigh station observed about 220 breeding crosses, but hot dry conditions made this difficult. Some promising crosses were identified, but most will be replanted. 16 new crosses were made in summer, and 86 are planned for winter.
 - v. Continued Ga1 gametophyte evaluation by retesting what was positive in 2021. Results were mostly consistent with 2021.

- vi. Budget increase allowed Raleigh to replace trailer, buy a small batch treater, expand ICB usage, support two graduate students and one post doc, and purchase a new envelope printer. For FY23, looking at getting new machine storage building, new nursery planter, replace truck, and expand nursery operations.
 - vii. Announced recent personnel changes, including Major Goodman's retirement
- 4. Top Line Project—Jode Edwards
 - a. Presented plans for 2023—finish remaining second year testing, and make new round of crosses. For each participating company, GEM lines are crossed with two company testers, grown at 8-10 locations, and include two standard checks. The next round of crosses will keep key releases and add new lines. Presented summary of top lines from 2021 data across companies (still analysing 2022 data, results will be shared later).
- 5. Project participation/support from cooperators summarized for Ames and Raleigh
- 6. GEM website status summarized by Dave Peters. Website is moving to an ARS portal, but still in progress. The website is planned to provide project information and GEM release information, along with any publications or reports.
- 7. Genomic Prediction Update
 - a. Matt—724 lines submitted for genotyping in 2020. 429 in 2021, 1035 lines in 2022. For 2023, plan to genotype 560 lines. Will compare phenotypic data to predictions, hope to incorporate genomic selection into system by 2025.
 - b. Adam—summarized submission totals for genotyping. He plans to use this to identify populations for testing and increase S2/S3 availability, but will still need to continue normal top-cross prior to GEBV return.
- 8. Genome to Fields Update—Dayane Lima
 - a. Introduced Genome to Fields project and goals. Summarized material evaluated each year since 2014 and the plans through 2025. GEM derived NSS lines were tested in 2022 and 2023, and GEM derived SS lines will be tested in 2024 and 2025. Next year the project will be releasing all genotypic data from 2013-2023. All material is genotyped, and each environment is characterized. Phenotypic data collection includes UAV imagery, such as NDVI and canopy cover.
- 9. Incoming TSG Chair—Jim Parks
 - a. Jim presented his thoughts on corn breeding history, where it stands today, and future challenges. Going forward, Jim wants to focus on the GEM mission and increase visibility to more stakeholders. The mission focus is to increase US maize diversity, collaborate between public and private, bring new alleles into changing environments, and train new scientists. He wants to continue the modernization of GEM, such as genomic selection, reducing cycle time, and other ways to improve effort.
- 10. TSG Chairman Recap—Walter Trevisan,
 - a. Walter reviewed past TSG chairs and GEM project leaders and discussed how the GEM project has adapted to be more applicable and impactful. Recognized the donation of tropical material from Bayer representing new diversity for the project. He also highlighted recent changes, such as the decreased cycle time by GEM, Bayer donating DH efforts and genomic selection, and increased testing by Corteva. In summarizing the composition of GEM releases since 2014, he noted a large increase in recycling of GEM

material (over half of releases now half GEM parent). Discussed large diversity that is unused by US and other countries, as US germplasm has a large usage by other countries.

11. Future Meeting Location—Presented potential times and locations for future cooperator meetings as ASTA moves to Orlando starting in 2023. A survey will be sent out to all cooperators to get a more complete collection of ideas.

12. Meeting adjourned at 11:55 AM CST

Annual Reports

2023 Annual Reports

GEM – Raleigh Project Highlights

Germplasm releases:

- There will be four new releases from the Raleigh project for 2024, please see the Yield Trial section of this book for more information on the performance of these lines in hybrid combinations.

Table 1. 2023 GEM-Raleigh Germplasm Releases

Line	Pedigree	% Exotic	Exotic Background	2023 Trial
GEMS-0330	(GEMS-0050/CL-G1501:S17b-B-020)-003-01-B	37.5%	GEMS-0050 = DKB844:S1601 (Trop. Hybrid), CL-G1501 is a line from the CIMMYT Early White Tropical Flint pool	23NCG01
GEMN-0331	(GEMN-0135/GEMN-0137)-002-02	50%	GEMN-0135 = DKXL380:N11 (Trop Hybrid) GEMN-0137 = St Croix Gp3:N14 (Tuson)	23NCG02
GEMS-0332	GEMS-0227/42T1-B05-02	~63%	GEMS-0227 = NEI9004:S2809 (Trop. Inbred) 42T1 is tropical germplasm from company 42	23NCG04
GEMS-0333	GEMS-0227/42T2-B44-01	~63%	GEMS-0227 = NEI9004:S2809 (Trop. Inbred) 42T2 is tropical germplasm from company 42	23NCG04

Germplasm development:

- Our summer nurseries have been rebounding from the low of 2020 but the lack of temporary summer labor is still restricting our ability to expand to the degree that we would prefer. Approximately 2000 GEM nursery plots were grown in Clayton, NC (up from 1800 in 2022), and 200 additional nursery rows were contracted with Gro Alliance in Mt Pulaski, IL. 4000 isolation plots across five different Peterson Corn Genetics testers were planted under contract with Gro Alliance, doubling the number of ICB rows planted with them in 2022.
- A small number of breeding crosses were produced in the summer nursery this year (GEMS four-way crosses), and these will be further crossed in 2024 to develop eight-way crosses. Several combinations of exotic x temperate and exotic x GEM crosses are planned for winter nursery in Puerto Vallarta.
- Conditions were not favorable for great returns from the nursery in 2023, with wet, cool conditions from planting to pre-flowering and hot, dry conditions throughout the pollinating period. The numbers of selected ears were lower than expectations due to poor ear formation (or complete failure) and poor seed set.
- We no longer have the option to plant off-season nurseries in Florida. We sent 850 plots to winter nursery with Semillas Moreno-Retis near Puerto Vallarta, Mexico. Most of the germplasm sent to

Mexico was for breeding cross development or for making testcrosses for yield trials. We are looking into other possibilities for winter nursery as well, but the timing of our growing season in North Carolina and the maturities of the germplasm we are working with restricts our options.

Germplasm Evaluations:

- Overall, about 11000 yield plots were coordinated from Raleigh, with slightly more than half of those planted in North Carolina and the rest planted by six cooperators (Corteva, Bayer, University of Tennessee, AgReliant; USDA-Starkville and GEM-Ames) at locations throughout the Southeast and Midwest. This is the second year we had trials planted in NC under contract with the NC Official Variety Testing group. They planted close to 500 plots at each of four different locations, two in the eastern part of NC, one in the coastal plain and one in Piedmont.
- Evaluations of GEM releases from Raleigh and Ames were included in experiments 21NCG13 and 21NCG14 to identify lines with the best potential for use in GEM x GEM crosses and to compare some of the available testers from Peterson Corn Genetics. Data from these trials is presented in the Yield Trial section of this book.

Personnel:

- Kaitlin Tallarida joined the project in May of 2023 as a GS-5 technician. We plan to have her assume responsibility for pathology work on the project, including screening of GEM lines for Southern Leaf Blight, Gray Leaf Spot and possibly Northern Leaf Blight at several locations in NC. This work was handled by Dale Dowden until he fully retired a few years ago.
- Dr. David Marshall, Research Leader for the Plant Science Research Unit for about 20 years, retired in January of 2022, and we are still working on finding his replacement.

Host Plant Resistance:

- GEM releases were evaluated for mycotoxin accumulation by USDA-ARS researchers at Starkville, MS. Gray Leaf Spot and Northern Leaf Blight evaluations were not conducted for GEM lines in North Carolina in 2023. We are hoping to restart this work in 2024, see the personnel section for more information.

Breeding Cross and other observations:

- Breeding crosses and exotic/semi-exotic populations were planted in two different blocks at Clayton, NC during 2023, divided by heterotic pattern of the temperate parent(s). Notes on the entries are presented in the “Breeding Cross Observations” section of this book.
- There are many breeding crosses that appear promising, and decisions will be made as to which crosses best represent both the exotic sources and the temperate parents. We will be looking to initiate inbreeding and selection in 12-15 new breeding crosses in the 2024 nursery.
- A subset of about 140 entries of the germplasm recently donated by Bayer was planted in the field in the spring, and selections made for lines to evaluate further. We based the initial subset on the exotic parentage of the lines, choosing races of maize that are underrepresented in our breeding efforts and/or more equatorial and lowland in origin (landraces from Argentina and Chile or from high altitudes tend to perform poorly in North Carolina). The most promising selections will be planted in the nursery in 2024, and all the selections will be crossed to appropriate testers in 2024 and evaluated in 2025.

Summer TSG meeting:

- We had the pleasure of hosting several members of the GEM TSG at the Central Crops Research Station for the annual summer meeting of the TSG. The meeting alternates between the Raleigh and Ames sites, with Raleigh hosting during odd years.
- The TSG members in attendance had the opportunity to tour some of our facilities as well as walk through nursery and observation plots.

GEM – Ames Project Highlights

Germplasm releases and development:

- Three hundred and thirty (330) GEM line releases are now available to GEM Cooperators. A total of 349 lines have been released, including 19 from our university collaborators.
- The Ames program will be releasing three new GEM lines for the 2024 planting season. Summary data for the 2024 releases can be found in the *GEM Releases* section of this handout.

Table 2. 2023 GEM-Ames Germplasm Releases

Line	Pedigree	Source	Country	Type
GEMS-0334	La Posta Seq C7 F71-1-1-1-2/40a//R3212Z-060-001-001-B	Tropical Inbred	Mexico	25% Exotic
GEMS-0335	PHHB4/KS23-6//2FACC-139-001-001-B	Tropical Inbred	Thailand	25% Exotic
GEMS-0336	PHHB9//KS23-6/PHW52-139-001-001-B	Tropical Inbred	Thailand	25% Exotic

Breeding Nursery and Isolated Crossing:

- Eight new breeding cross populations were sent to five Cooperators for in-kind support. Populations will be advanced from S0 to S1 generation.
- Fifty S1 bulked families were advanced to the S2 generation by Force Genetics and GEM-Ames.
- Thirty-four S2 bulked families were advanced to the S3 generation by Gro Alliance. S3s will be topcrossed in 2024.
- DH lines were increased from the populations:
 1. GEMN-0144/GEMN-0249//GEMN-0187/GEMN-0261///GEMN-0192/GEMN-0309//GEMN-0246/GEMN-0267
 2. GEMS-0226/GEMS-0264//GEMS-0297/GEMS-0308///GEMS-0066/GEMS-0268//GEMS-0072/GEMS-0251
- For the GEMN population, 1064 DH lines were recovered and successfully increase. Seven hundred and eight-seven (787) DH lines were increased for the GEMS population. Remnant haploid seed was sent to the Iowa State Doubled Haploid Facility to undergo doubling for the GEMS population.

Nursery and isolation row summary:

- 3,442 nursery rows were pollinated (~24,000 pollinations)
 - An additional 760 rows were sent to Gro Alliance for selfing and crossing.
- 2,230 observation rows
- 4,420 isolation rows
- 3,208 rows with Gro Alliance
 - 1,212 rows managed by GEM-Ames

Genomic Prediction Project:

- A collaborative project with Bayer Crop Science was initiated to explore use of genomic prediction in GEM breeding program. Bayer has committed to run 100 high-density parental samples and 2,500 low-density genotyping samples, annually.
- GEM Ames sent 14 new parental lines and 1,936 segregating lines.
- Genomic estimated breeding values generated by this project were used by GEM-Ames for selecting lines to include within 1st year yield trials.

Breeding Cross Observations:

- Three hundred and eighty-six populations were observed and evaluated in Ames, IA. From these populations, 80 were selected and sent to winter nursery to be advanced to the S1 generation.

Host Plant Resistance:

- Pathology and entomology research collaborators from the U.S. private and public sectors screened GEM releases for Northern Leaf Blight, Southern Leaf Blight, Goss's Bacterial Wilt, Head Smut, Fusarium ear rot, Aspergillus, and Tar Spot. Disease evaluation trials are summarized in Table 3.
- Corteva provided Fusarium ear rot data and head smut data from their Woodland, CA site. Trials for Northern Leaf Blight were conducted in Johnston, IA. Bayer conducted trials for Goss's Bacterial Wilt (Nebraska) and Tar Spot (Illinois). However, storm damage and lack of disease development caused the loss of these trials. USDA-ARS-PSRU conducted screening on Southern Leaf Blight. USDA-ARS-CHPRRU provided mycotoxin data on GEM released lines. Wyffels screened GEM lines for Goss's Bacterial Wilt.

Table 3. 2023 Disease Observation Summary

Cooperator	Location	Disease	Plots
Bayer	Nebraska	Goss's Bacterial Wilt	500
	Illinois	Tar Spot	300
Corteva	Iowa	Northern Leaf Blight	500
	California	Fusarium Ear Rot	500
	California	Head Smut	500
USDA-ARS	North Carolina	Southern Leaf Blight	200
	Mississippi	Aflatoxin/Fumonisin	20
Wyffels	Illinois	Goss's Bacterial Wilt	150

Yield Trials:

- Approximately 10,800 plots (1,456 entries) were managed or coordinated through Ames in 2023 (Table 3 and 20).
- Of the core development program, 4,608 plots were devoted to 2nd year trials and 4,800 plots for 1st year trials.
- Planting dates ranged from 2 May to 20 May. Weather and mechanical shortcomings led to delayed planting dates.
- Minimal storm damage was received in Williams, Carroll, and Atlantic.
- Stand count data was collected in collaboration with Iowa Crop Improvement Association using their drone data collection system.
- Five standard checks were used throughout 1st year trials: 1) P0589, 2) P1185, 3) W7870, 4) MBS3919/MBS5507, and 5) MBS3628/MBS9530. An additional check, W4240, was included in 2nd year trials.

Table 4. Ames and Cooperator Yield Trial Resource Summary

Trial Type	# Entries	# Plots Ames	# Plots Coops	Total Plots
1st Year Trials	780	3,288	1,512	4,800
2nd Year Trials	408	1,440	3,168	4,608
Released Line Trials	72	216	720	936
Collaborator Trials	196	536	0	536
Totals	1,456	5,480	5,400	10,880

New GEM Cooperators in 2023:

- CLSC Agriscience, LLC., an international private Cooperator, is pending approval.
- Sanya Dabeinong Genseed Genetics Co. Ltd., an international private Cooperator, is currently completing application documents for review.
- Maize Research Institute, Ministry of Agriculture and Forestry of the Republic of Turkey, has submitted application documents and is pending approval.

Germplasm Donation:

- Bayer Crop Science initiated a germplasm project in 2016 to adapt several land races to the central Corn-Belt. Representative accessions (1 to 5 per land race) were selected and crossed to a current elite 105-day SS and 105-day NSS inbred line. Crosses were made within each land race and lines selected for flowering in central Iowa. Lines were recombined and selected through the 2019 growing season for adaptation to central Iowa.
- Table 5 lists the landraces and percentages of the tropical donor for the lines increased in summer 2023 and winter 2023/2024.

Table 5. Germplasm Donation Increase Summary

Race	% Tropical	Group	Country	Increase Season
Amarillo de Nuble	63, 75	Both	Chile	Summer 2023
Choclero	63, 75	NSS	Chile	Summer 2023
Curagua	63, 75	NSS	Chile	Summer 2023
Diente de Caballo	63, 75	NSS	Chile	Summer 2023
Piricincio	50, 63	NSS	Peru	Summer 2023
Chaparreno	50, 63, 75	SS	Peru	Summer 2023
Perlita	63, 75	NSS	Argentina	Winter 23/24
Bolita	50, 63, 75	SS	Mexico	Winter 23/24
Reventador	63, 75	NSS	Mexico	Winter 23/24
Confite Puntigudo	50, 63, 75	NSS	Peru	Winter 23/24

GEM Top Lines Project:

- The second round of the GEM Top Line trial concluded in 2023. Thirty released lines from Ames and Raleigh were included in this round of testing. This set of lines were tested from 2021 to 2023. Testing was extended an extra year due to weather related losses during 2020 topcross seed production.
- GEMN-0178 and GEMS-0298 will carry over from round 2 to round 3 for Ames, and GEMN-0287 and GEMS-0293 will carry over for the Raleigh Program. Round 3 will also include five GEMN lines was Ames and two from Raleigh. Ames has submitted 15 GEMS lines to also be included with the four lines from Raleigh.
- The 30 lines described above were sent to Cooperators to produce topcross seed in the summer 2023. Testing is scheduled to begin in summer 2024.

GEM Releases

GEMS-0330: (GEMS-0050/CL-G1501:S17b-B-20)-003-01

Exotic Background:

- GEMS-0050 was derived from tropical hybrid DKB844.
- CL-G1501 is a tropical inbred from the CIMMYT Early White Tropical Flint pool that was developed in Mexico.

Hybrid Performance:

Tester	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
MBS3520	212	100	20.8	10.3	51.3	0	0	100	304	139
PC2754	191	90	19.7	9.9	52.7	0	3.3	97	294	129

Experiment Mean	197	93	20.5	9.7	53.7	1	0.1	99	294	131
Check Mean*	213		20.8	10.3	55.9	0.2	0	100	290	129
LSD (0.05)	12.5		0.8	0.7	0.8	2.1	0.8	2.1	12.1	6.8
C.V. (%)	8.5		5.3	9.4	2	271	830	2.9	5.5	7

*Checks include Dekalb 63-57, DeKalb 64-69, Dekalb 67-44, Pioneer 1464VYHR, and Pioneer 1637R.

Yield, Moisture, Y/M calculated from 11 environments, Test Weight from 9 environments, Root and Stalk Lodging and Erect Plants from 3 environments, and Plant and Ear Height from 7 environments.



GEMN-0331: (GEMN-0135/GEMN-0137)-002-02

Exotic Background:

- GEMN-0135 was derived from a tropical hybrid DKXL380.
- GEMN-0137 has a Tušon tropical inbred parent that was developed in St. Croix.

Hybrid Performance:

Tester	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
MBS3520	176	90	19.7	9	55.7	3.5	0	94	260	116
PC2754	178	92	21.5	8.1	56.1	2.4	0.5	94	241	101

Experiment Mean	164	84	19.7	8.4	55.5	1.4	0.4	94	261	107
Check Mean*	194	100	19.8	9.8	57.7	0.2	0.1	94	254	107
LSD (0.05)	16.6	8.6	0.9	0.8	0.9	2.1	1.2	5.4	14.8	11.6
C.V. (%)	13.2	6.8	6.1	12.7	2	195	417	7.4	7.3	14

*Checks include Dekalb 67-44, DeKalb 68-69, Pioneer 1464VYHR, Pioneer 1794VYHR and Pioneer 1847VYHR. Yield, Moisture, Y/M calculated from 11 environments, Test Weight from 8 environments, Root and Stalk Lodging from 5 environments, Erect Plants from 6 environments, and Plant and Ear Height from 4 environments.



GEMS-0332: (GEMS-0227/42T1)-B05-02

Exotic Background:

- GEMS-0227 has a tropical inbred parent from NEI9004 (Suwan).
- 42T1 is a tropical inbred from company 42.

Hybrid Performance:

Tester	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
MBS6717	167	92	15.9	10.6	55.7	0.3	0	100	277	114
MBS8731	169	93	16.1	10.6	55.7	0.3	0	100	283	116

Experiment Mean	162		16.6	10	55.5	0.5	0.5	99	279	116
Check Mean*	182		16.7	11	57	0.6	1	100	274	120
LSD (0.05)	12.7		0.7	0.9	0.9	1	1.6	1.3	10.4	8.2
C.V. (%)	10.6		5.8	11.6	2.1	273	414	1.8	5	9.4

*Checks include Dekalb 63-57, DeKalb 64-69, Dekalb 67-44, Pioneer 1464VYHR, and Pioneer 1637R. Yield, Moisture, Y/M calculated from 13 environments, Test Weight from 8 environments, Root and Stalk Lodging, Erect Plants and Plant and Ear Height from 9 environments.



GEMS-0333: (GEMS-0227/42T2)-B44-01

Exotic Background:

- GEMS-0227 has a tropical inbred parent from NEI9004 (Suwan).
- 42T2 is a tropical inbred from company 42.

Hybrid Performance:

Tester	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
MBS6717	165	91	16.9	9.9	56	0.6	0	99	282	114
MBS8731	173	95	17.6	9.8	54.2	0	0.7	99	287	130

Experiment Mean	162		16.6	10	55.5	0.5	0.5	99	279	116
Check Mean*	182		16.7	11	57	0.6	1	100	274	120
LSD (0.05)	12.7		0.7	0.9	0.9	1	1.6	1.3	10.4	8.2
C.V. (%)	10.6		5.8	11.6	2.1	273	414	1.8	5	9.4

*Checks include Dekalb 63-57, DeKalb 64-69, Dekalb 67-44, Pioneer 1464VYHR, and Pioneer 1637R. Yield, Moisture, Y/M calculated from 13 environments, Test Weight from 8 environments, Root and Stalk Lodging, Erect Plants and Plant and Ear Height from 9 environments



GEMS-0334: La Posta Seq C7 F71-1-1-1-2/S40a//R3212Z-060-001

Exotic Background:

- La Posta Sequía is a population, formally known as Pop.43 C6 (Edmeades et al 1997), that underwent S1 recurrent selection at CIMMYT in Mexico in the 1980s for drought and, indirectly, heat tolerance. The resulting population was further selected by the Africa Maize Stress Project in Kenya. La Posta Seq C7 F71-1-1-1-2 was a line produced by this project.

Line Performance:

- Plant Height – 215 cm
- Ear Height – 85 cm
- Fusarium Ear Rot – 5 (1-9; 9 is the best)
- Head Smut – 87.5% of plants disease free when inoculated
- Northern Leaf Blight – 6 (1-9; 9 is the best)

Hybrid Performance:

Exp	# Reps	Tester	RM	Yield (bu/a)	Y/M	%MST	% Stalk Lodging	% Root Lodging	Test Weight	Plant Height (cm)	Ear Height (cm)
2364203	14	MBS8488	108	239.7	13.1	18.4	1.3	3.1	57.4	277.8	120.0
Check Mean				248.5	13.5	18.9	1.6	1.0	57.2	271.4	121.0
2364204	10	MBS8731	111	253.9	13.2	19.3	0	0	54.7	295.3	124.2
Check Mean				247.7	13.6	18.2			58.0	271.4	114.7



GEMS-0335: PHHB4/KS23-6//2FACC-139-001

Exotic Background:

- KS26-6 is a tropical inbred from Thailand from Suwan Farms.

Line Performance:

- Plant Height – 248 cm
- Ear Height – 103 cm
- Fusarium Ear Rot – 5 (1-9; 9 is the best)
- Head Smut – 97.5% of plants disease free when inoculated
- Northern Leaf Blight – 6 (1-9; 9 is the best)

Hybrid Performance:

Exp	# Reps	Tester	RM	Yield (bu/a)	Y/M	%MST	% Stalk Lodging	% Root Lodging	Test Weight	Plant Height (cm)	Ear Height (cm)
2364201	14	MBS8488	107	228.7	13.0	17.6	0	0	58.9	279.3	108.3
Check Mean				238.6	14.2	18.0	0.1	1.8	57.9	271.6	115.7
2364202	10	MBS8731	112	246.3	12.1	20.3	2.3	3.2	55.6	302.5	141.8
Check Mean				251.5	13.5	18.6	2.9	1.1	58.1	293.5	131.9



GEMS-0336: PHHB9//KS23-6/PHW52-139-001

Exotic Background:

- KS23-6 is a tropical inbred from Thailand from Suwan Farms.

Line Performance:

- Plant Height – 235 cm
- Ear Height – 87 cm
- Fusarium Ear Rot – 4.5 (1-9; 9 is the best)
- Northern Leaf Blight – 3.5 (1-9; 9 is the best)

Hybrid Performance:

Exp	# Reps	Tester	RM	Yield (bu/a)	Y/M	%MST	% Stalk Lodging	% Root Lodging	Test Weight	Plant Height (cm)	Ear Height (cm)
2364201	14	MBS8488	110	244.1	13.2	18.5	1.3	6.3	58.3	296.7	113.3
Check Mean				248.15	14.2	18.0	0.1	1.8	57.9	271.6	115.7
2364302	10	MBS8731	113	257.9	12.4	20.8	4.2	1.8	56.3	321.5	141.8
Check Mean				251.53	13.5	18.6	2.9	1.1	58.1	293.5	131.9



Table 6. 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	5	0	0	5
Argentino/Tuxpeño	1	0	0	1
Camelia	7	0	1	8
Cateto	0	11	0	11
Cateto Sulino	4	0	0	4
Cateto/Mixed Tropical	0	1	0	1
Corn Belt Dent	1	0	0	1
Creole	17	1	1	19
Creole/Tropical Inbred	3	0	0	2
Criollo	1	1	0	2
Criollo/Argentino	0	0	1	1
Criollo/Tusón	1	0	0	1
Cristalino Colorado	16	0	2	18
Cuban Yellow	6	3	0	9
Dentado Blanco	5	0	0	5
Dentado Blanco Rugoso	3	0	3	6
Dente Amarelo	10	3	1	14
Dente Amarelo/Mixed Tropical	2	0	0	2
Dente Branco	5	0	0	5
Early Caribbean	1	0	0	1
Mixed Tropical	13	2	4	19
Mixed Tropical//Dente Amarelo/Tropical Hybrid	1	0	0	1
Multiple Borer Composite	1	0	0	1
Semidentado Riograndense	2	0	0	2
St. Croix	1	1	1	3
Suwan	14	4	0	20
Suwan/Cristalino Colorado	2	0	0	2
Suwan/Tusón	1	0	0	1
Tropical Hybrid	25	77	4	106
Tropical Hybrid/Mixed Tropical	1	2	0	3
Tropical Hybrid/Multiple Borer Composite	1	0	0	1
Tropical Hybrid/Tuxpeño	0	1	0	1
Tropical Inbred	22	10	0	32
Tropical Inbred/Mixed Tropical	1	0	0	1
Tropical Inbred/Tropical Hybrid	1	0	0	1
Tropical Inbred/Tusón	2	0	0	2
Tusón	10	3	1	14
Tuxpeño	4	8	0	12
Tuxpeño/Olotillo	3	0	0	3
Tuxpeño/Olotillo/Tropical Inbred	1	0	0	0
Unclassified Tropical	1	0	0	1
Totals	199	124	19	349

Table 7. GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site	Year
1	Piura 144/B94/B94)	GEMS-0001	Alazan	Peru	Ames	2001
2	FS8A(S):S09-043-002	GEMS-0002	Mixed Tropical	Mixed	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	Tropical Hybrid	Thailand	NC	2003
5	DK212T:S11-B-015-001-B-B	GEMS-0005	Tropical Hybrid	Thailand	NC	2003
6	DK212T:S11-B-017-001-B-B	GEMS-0006	Tropical Hybrid	Thailand	NC	2003
7	DK212T:S11-B-018-001-B-B	GEMS-0007	Tropical Hybrid	Thailand	NC	2003
8	DK212T:S11-B-038-001-B-B	GEMS-0008	Tropical Hybrid	Thailand	NC	2003
9	DK212T:S11-B-040-001-B-B	GEMS-0009	Tropical Hybrid	Thailand	NC	2003
10	DK212T:S11-B-041-002-B-B	GEMS-0010	Tropical Hybrid	Thailand	NC	2003
11	DK212T:S11-B-045-002-B-B	GEMS-0011	Tropical Hybrid	Thailand	NC	2003
12	DK888:S11-B-003-001-B-B	GEMS-0012	Tropical Hybrid	Thailand	NC	2003
13	DK888:S11-B-004-004-B-B	GEMS-0013	Tropical Hybrid	Thailand	NC	2003
14	DK888:S11-B-010-001-B-B	GEMS-0014	Tropical Hybrid	Thailand	NC	2003
15	DK888:S11-B-014-001-B-B	GEMS-0015	Tropical Hybrid	Thailand	NC	2003
16	DK888:S11-B-015-003-B-B	GEMS-0016	Tropical Hybrid	Thailand	NC	2003
17	DK888:S11-B-025-001-B-B	GEMS-0017	Tropical Hybrid	Thailand	NC	2003
18	DK888:S11-B-026-002-B-B	GEMS-0018	Tropical Hybrid	Thailand	NC	2003
19	DK888:S11-B-029-001-B-B	GEMS-0019	Tropical Hybrid	Thailand	NC	2003
20	DK888:S11-B-033-001-B-B	GEMS-0020	Tropical Hybrid	Thailand	NC	2003
21	DK888:S11-B-035-002-B-B	GEMS-0021	Tropical Hybrid	Thailand	NC	2003
22	DK888:S11-B-035-003-B-B	GEMS-0022	Tropical Hybrid	Thailand	NC	2003
23	DK888:S11-B-039-002-B-B	GEMS-0023	Tropical Hybrid	Thailand	NC	2003
24	DKB830:S11-B-045-001-B-B	GEMS-0024	Tropical Hybrid	Mexico	NC	2003
25	DKXL370:S11-B-001-002-B-B	GEMS-0025	Tropical Hybrid	Brazil	NC	2003
26	DKXL370:S11-B-025-001-B-B	GEMS-0027	Tropical Hybrid	Brazil	NC	2003
27	DKXL370:S11-B-025-002-B-B	GEMS-0028	Tropical Hybrid	Brazil	NC	2003
28	DKXL370:S11-B-028-001-B-B	GEMS-0029	Tropical Hybrid	Brazil	NC	2003
29	DKXL380:S11-B-004-003-B-B	GEMS-0030	Tropical Hybrid	Brazil	NC	2003
30	DKXL380:S11-B-028-001-B-B	GEMS-0031	Tropical Hybrid	Brazil	NC	2003
31	DKXL380:S11-B-029-001-B-B	GEMS-0032	Tropical Hybrid	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
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	Tropical Hybrid	Brazil	Ames	2003

Table 7. GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site	Year
46	DKB844:S1601-512-1-B	GEMS-0049	Tropical Hybrid	Mexico	Ames	2003
47	DKB844:S1601-517-1-B	GEMS-0050	Tropical Hybrid	Mexico	Ames	2003
48	CUBA164:S2008a-83-1-B	GEMS-0051	Creole	Cuba	Ames	2003
49	CUBA164:S2008a-326-1-B	GEMS-0052	Creole	Cuba	Ames	2003
50	CUBA164:S15-192-2-B	GEMS-0053	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 Tropical	Mixed	Ames	2003
54	AR01150:N04-545-1-B	GEMN-0057	Dentado Blanco Rugoso	Argentina	Ames	2003
55	AR01150:N04-696-1-B	GEMN-0058	Dentado 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	Creole	Cuba	Ames	2003
61	CUBA164:S1511b-249-1-B-B	GEMS-0064	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/(H99ae/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
71	CUBA164:S1517-163-001	GEMS-0074	Creole	Cuba	Ames	2003
72	CUBA164:S1517-241-002	GEMS-0075	Creole	Cuba	Ames	2003
73	DKB844:N11b-118-001	GEMN-0076	Tropical Hybrid	Mexico	Ames	2003
74	DKXL370:N11a20-604-001	GEMN-0077	Tropical Hybrid	Brazil	Ames	2003
75	FS8A(S):S09-362-001	GEMS-0078	Mixed Tropical	Mixed	Ames	2003
76	FS8B(S):S0316-802-001	GEMS-0079	Mixed Tropical	Mixed	Ames	2003
77	FS8B(S):S0316-814-001	GEMS-0080	Mixed Tropical	Mixed	Ames	2003
78	FS8B(T):N1802-382-001	GEMN-0081	Mixed Tropical	Mixed	Ames	2003
79	FS8B(T):N1802-525-001	GEMN-0082	Mixed Tropical	Mixed	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	Creole	Cuba	Ames	2004
90	CUBA164:S2012-966-001	GEMS-0093	Creole	Cuba	Ames	2004

Table 7. GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site	Year
91	DKXL370:N11a20-199-002	GEMN-0094	Tropical Hybrid	Brazil	Ames	2004
92	DKXL370:N11a20-234-002	GEMN-0095	Tropical Hybrid	Brazil	Ames	2004
93	DKXL370:N11a20-322-001	GEMN-0096	Tropical Hybrid	Brazil	Ames	2004
94	FS8B(T):N11a-087-001	GEMN-0097	Mixed Tropical	Mixed	Ames	2004
95	FS8B(T):N11a-110-001	GEMN-0098	Mixed Tropical	Mixed	Ames	2004
96	FS8B(T):N11a-322-001	GEMN-0099	Mixed Tropical	Mixed	Ames	2004
97	UR11003:S0302-937-001	GEMS-0100	Dente Branco	Uruguay	Ames	2004
98	DK212T:S11b-007-B-B	GEMS-0101	Tropical Hybrid	Thailand	NC	2004
99	DK888:S11b-001-B	GEMS-0102	Tropical Hybrid	Thailand	NC	2004
100	DK888:N11(95)-B-027-010-B-B	GEMN-0103	Tropical Hybrid	Thailand	NC	2004
101	DK888:N11(95)-B-027-012-B-B	GEMN-0104	Tropical Hybrid	Thailand	NC	2004
102	DK888:N11(95)-B-027-015-B-B	GEMN-0105	Tropical Hybrid	Thailand	NC	2004
103	DK888:N11(95)-B-022-007-B-B	GEMN-0106	Tropical Hybrid	Thailand	NC	2004
104	DK888:N11(95)-B-022-012-B-B	GEMN-0107	Tropical Hybrid	Thailand	NC	2004
105	DK888:N11(95)-B-027-001-B-B	GEMN-0108	Tropical Hybrid	Thailand	NC	2004
106	DKXL380:N11-B-015-003-B-B	GEMN-0109	Tropical Hybrid	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	Tropical Hybrid	Thailand	Ames	2005
112	DKB844:S1601-073-001	GEMS-0115	Tropical Hybrid	Mexico	Ames	2005
113	DKB844:S1601-003-002	GEMS-0116	Tropical Hybrid	Mexico	Ames	2005
114	DREP150:N2011d-624-001	GEMN-0117	Mixed Tropical	Dominican 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	Tropical Hybrid	Thailand	NC	2005
122	DK888:S11-B-029-001-B	GEMS-0125	Tropical Hybrid	Thailand	NC	2005
123	DK888:S11-B-029-006-B	GEMS-0126	Tropical Hybrid	Thailand	NC	2005
124	DK888:N11(95)-B-017-001-B	GEMN-0127	Tropical Hybrid	Thailand	NC	2005
125	DKXL370:N11-B-005-002-B	GEMN-0128	Tropical Hybrid	Brazil	NC	2005
126	DKXL370:N11-B-005-006-B	GEMN-0129	Tropical Hybrid	Brazil	NC	2005
127	DKXL370:N11-B-005-010-B	GEMN-0130	Tropical Hybrid	Brazil	NC	2005
128	DKXL370:N11-B-005-011-B	GEMN-0131	Tropical Hybrid	Brazil	NC	2005
129	DKXL370:N11-B-005-021-B	GEMN-0132	Tropical Hybrid	Brazil	NC	2005
130	DKXL370:N11-B-029-002-B	GEMN-0133	Tropical Hybrid	Brazil	NC	2005
131	DKXL380:N11-B-010-017-B	GEMN-0134	Tropical Hybrid	Brazil	NC	2005
132	DKXL380:N11-B-007-025-B	GEMN-0135	Tropical Hybrid	Brazil	NC	2005
133	DKXL380:N11-B-007-028-B	GEMN-0136	Tropical Hybrid	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

Table 7. GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site	Year
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
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	Tropical Inbred	Thailand	Ames	2006
144	NEI9004:S2818-025-001	GEMS-0147	Tropical Inbred	Thailand	Ames	2006
145	NEI9004:S2818-376-001	GEMS-0148	Tropical Inbred	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	Tropical Hybrid	Thailand	NC	2006
150	DKXL380:N11-B-007-027-B-B-B-B	GEMN-0153	Tropical Hybrid	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	Creole	Cuba	Ames	2007
161	DK212T:N11-B-003-022-B-B-B	GEMN-0164	Tropical Hybrid	Thailand	NC	2007
162	DK888:N11(95)-B-022-012-026-B-B	GEMN-0165	Tropical Hybrid	Thailand	NC	2007
163	DK888:N11(95)-B-027-001-008-B-B	GEMN-0166	Tropical Hybrid	Thailand	NC	2007
164	DK888:N11(95)-B-027-001-018-B-B	GEMN-0167	Tropical Hybrid	Thailand	NC	2007
165	DK888:N11(95)-B-027-001-019-B	GEMN-0168	Tropical Hybrid	Thailand	NC	2007
166	DK888:N11(95)-B-027-001-027-B	GEMN-0169	Tropical Hybrid	Thailand	NC	2007
167	DK888:N11(95)-B-027-001-030-B	GEMN-0170	Tropical Hybrid	Thailand	NC	2007
168	DK888:N11(95)-B-027-001-037-B	GEMN-0171	Tropical Hybrid	Thailand	NC	2007
169	DK888:N11(95)-B-027-001-040-B	GEMN-0172	Tropical Hybrid	Thailand	NC	2007
170	DK888:N11(95)-B-027-012-009-B	GEMN-0173	Tropical Hybrid	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 Islands	Ames	2008
173	CUBA164:S2008c-289-001	GEMS-0176	Creole	Cuba	Ames	2008
174	DK888:N11a08a-395-001	GEMN-0177	Tropical Hybrid	Thailand	Ames	2008
175	DK888:N11a08a-440-001	GEMN-0178	Tropical Hybrid	Thailand	Ames	2008
176	FS8B(T):N11a08c-030-002	GEMN-0179	Mixed Tropical	Mixed	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

Table 7. GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site	Year
181	GUAT209:S1308a-120-001	GEMS-0184	Tusón	Guatemala	Ames	2008
182	CUBA164:S2012-966-001-B wx	GEMS-0185	Creole	Cuba	Ames	2008
183	DKXL370:N11a20-036-002-B wx	GEMN-0186	Tropical Hybrid	Brazil	Ames	2008
184	ANTIG03:N1218-056-001	GEMN-0187	Criollo	Antigua	Ames	2009
185	DKXL212:S0912-012-001	GEMS-0188	Tropical Hybrid	Brazil	Ames	2009
186	DKXL212:S0912-117-001	GEMS-0189	Tropical Hybrid	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	Tropical Hybrid	Thailand	NC	2009
192	DK888:N11(95)-B-027-001-015-B	GEMN-0195	Tropical Hybrid	Thailand	NC	2009
193	DK888:N11(95)-B-003-001-001-B	GEMN-0196	Tropical Hybrid	Thailand	NC	2009
194	DK888:N11(95)-002-021-008-B-B	GEMN-0197	Tropical Hybrid	Thailand	NC	2009
195	DK212T:N11-040-001-007	GEMN-0198	Tropical Hybrid	Thailand	NC	2009
196	AR16021:S0908a-039-001	GEMS-0199	Cristalino Colorado	Argentina	Ames	2010
197	BR105:S1612-008-001	GEMS-0200	Suwan	Brazil	Ames	2010
198	BR105:S1612-057-001	GEMS-0201	Suwan	Brazil	Ames	2010
199	BR105:S1640-128-001	GEMS-0202	Suwan	Brazil	Ames	2010
200	CUBA164:S2008dF44-012-001	GEMS-0203	Creole	Cuba	Ames	2010
201	FS8A(T):N1804-006-001	GEMN-0204	Mixed Tropical	Mixed	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	Tropical Inbred	Mexico	NC	2010
208	DK888:N11-B-027-012-B-007	GEMN-0212	Tropical Hybrid	Thailand	NC	2010
209	DKXL380:N11-B-007-010-B-002	GEMN-0213	Tropical Hybrid	Brazil	NC	2010
210	MDI022:N21-B-002-003	GEMN-0214	Cuban yellow	Peru	NC	2010
211	NS1:S08-006-001-002	GEMS-0215	Tropical Inbred	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	Tropical Hybrid	Thailand	NC	2010
214	(CUBA164:S2012-459-001-B/GEMS-0002)-B-B-011	GEMS-0218	Creole	Cuba	Ames	2011
215	(CUBA164:S2012-459-001-B/GEMS-0002)-B-B-031	GEMS-0219	Creole	Cuba	Ames	2011
216	(GEMS-0113/GEMS-0091)-B-058-001	GEMS-0220	Tuxpeño/Olotillo	Mexico	Ames	2011
217	BR105:N1641-159-001	GEMN-0221	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	Creole	Cuba	Ames	2011
220	BG070404:D27S42-B-014	GEMS-0224	Unclassified Tropical	Venezuela	Ames	2012
221	BR105:N16a16b-B-074	GEMN-0225	Suwan	Brazil	Ames	2012
222	BR106:S(LH132)(PHG39)-B-053	GEMS-0226	Tuxpeño	Brazil	Ames	2012
223	NEI9004:S2809-B-022	GEMS-0227	Tropical Inbred	Thailand	Ames	2012
224	NEI9004:S2809-B-025	GEMS-0228	Tropical Inbred	Thailand	Ames	2012
225	SANM126:N12(LH123)-B-033	GEMN-0229	Cuban Yellow	Peru	Ames	2012

Table 7. GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site	Year
226	CML413:N18-001-036-002	GEMN-0230	Tropical Inbred	Mexico	NC	2012
227	CUBA164:D27-B-017-001	GEMN-0231	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	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/Tusón	Cuba	Ames	2013
232	DK212T:N11a10-B-110	GEMN-0236	Tropical Hybrid	Thailand	Ames	2013
233	DKXL370:S08c17c-B-008	GEMS-0237	Tropical Hybrid	Brazil	Ames	2013
234	NEI9004:N0803-B-027	GEMN-0238	Tropical Inbred	Thailand	Ames	2013
235	NEI9004:N0803-B-053	GEMN-0239	Tropical Inbred	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	Tropical Inbred	Mexico	NC	2013
240	CML287:S15-027-001-B	GEMS-0244	Tropical Inbred	Mexico	NC	2013
241	DK888:S11b-037-018-008-B	GEMS-0245	Tropical Hybrid	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	Suwan	Brazil	Ames	2014
246	CL-G1703:S17c43-B-023-B-B	GEMS-0250	Tropical Inbred	Mexico	Ames	2014
247	CL-G1703:S17c43-B-026-B-B	GEMS-0251	Tropical Inbred	Mexico	Ames	2014
248	DKB844:N11b18-241-001-B-B	GEMN-0252	Tropical Hybrid	Mexico	Ames	2014
249	DK212T:S0640-034-002	GEMS-0253	Tropical Hybrid	Thailand	NC	2015
250	FS8B(T):N11a-225-002	GEMN-0254	Mixed Tropical	Mixed	NC	2015
251	FS8B(S):S03-133-002	GEMS-0255	Mixed Tropical	Mixed	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	Tropical Hybrid	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	Dente Amarelo/Mixed Tropical	Brazil/Mixed	Ames	2015
257	(GEMN-0140/GEMN-0097)-B-B-027-B-B	GEMN-0261	Dente Amarelo/Mixed Tropical	Brazil/Mixed	Ames	2015
258	(GEMS-0147/GEMS-0180)-B-104-001-B-B	GEMS-0262	Tropical Inbred/Tusón	Thailand/Guatemala	Ames	2015
259	BR105:S1626(GEMS-0175)-B-049-B-B	GEMS-0263	Suwan/Tusón	Brazil/Virgin Islands	Ames	2015
260	BR105:S1643-078-001-B-B	GEMS-0264	Suwan	Brazil	Ames	2015
261	DKXL212:S0950-B-083-B-B	GEMS-0265	Tropical Hybrid	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	Suwan	Brazil	NC	2016
268	(GEMN-0043/GEMN-0097)-B-001	GEMN-0272	Cateto/Mixed Tropical	Brazil/Mixed	NC	2016
269	(GEMS-0032/GEMS-0050)-B-007	GEMS-0273	Tropical Hybrid/Tropical Hybrid	Brazil/Mexico	NC	2016
270	(GEMS-0032/GEMS-0113)-B-004	GEMS-0274	Tropical Hybrid/Tuxpeño	Brazil/Mexico	NC	2016

Table 7. GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site	Year
271	((KO679Y/GEMS-0115)/GEMS-0162)-008-001	GEMS-0275	Tropical Inbred	South Africa	Ames	2016
272	(53SS4/GEMS-0026)-SIB-B-003	GEMS-0276	Tropical Hybrid	Brazil	Ames	2016
273	(53SS4/GEMS-0031)-SIB-B-039	GEMS-0277	Tropical Hybrid	Brazil	Ames	2016
274	(GEMS-0115/S49w)-B-B-036	GEMS-0278	Tropical Hybrid	Mexico	Ames	2016
275	(GEMS-0176/S49w)-B-B-028	GEMS-0279	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	Tuxpeño/Olotillo	Mexico	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
281	(GEMN-0117/DKXL212:N11a-139-001-001-B-B-B-B-B)-B-B-019	GEMN-0285	Tropical Hybrid	Thailand	Ames	2016
282	MDI022:N(PHG35)(GEMN-0097)-072-001	GEMN-0286	Cuban yellow	Peru	Ames	2016
283	(GEMN-0108/GEMN-0178)-B-004	GEMN-0287	Tropical Hybrid	Thailand	NC	2016
284	(GEMS-0147/GEMS-0115)-B-002-001-001-B	GEMS-0288	Tropical Inbred/Tropical Hybrid	Thailand/Mexico	Ames	2017
285	(GEMS-0147/GEMS-0180)-B-033-001-001-B	GEMS-0289	Tropical Inbred/Tusón	Thailand/Guatemala	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	Thailand	Ames	2017
288	(GEMN-0097/GEMN-0136)-B-008	GEMN-0292	Mixed Tropical/Tropical Hybrid	Mixed/Brazil	NC	2017
289	CML341:S42-B-124	GEMS-0293	Tropical Inbred (Tuxpeño)	Mexico	NC	2017
290	DKB844:S16-005-022-012	GEMS-0294	Tropical Hybrid	Mexico	NC	2017
291	DKB830:S51-031-003	GEMS-0295	Tropical Hybrid	Mexico	NC	2017
292	(GEMS-0113/GEMS-0162)-B-B-054-001	GEMS-0296	Tuxpeño/Argentino	Mexico/Cuba	Ames	2018
293	(GEMS-0115/GEMS-0222)-B-B-033-001	GEMS-0297	Tropical Hybrid/Multiple Borer Composite	Mexico	Ames	2018
294	(GEMS-0219/GEMS-0227)-B-015-001	GEMS-0298	Creole/Tropical Inbred	Cuba/Thailand	Ames	2018
295	(H8431/((GEMS-0115/Mp717)/TZAR101))-SIB-B-005-001	GEMS-0299	Tropical Inbred	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/Mixed Tropical	Brazil/Mixed	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	Tropical Hybrid/Mixed Tropical	Thailand/Mixed	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
309	((GEMS-0162/PHP38)/GEMS-0227)-206-001-001	GEMS-0313	Argentino/Tropical Inbred	Cuba/Thailand	Ames	2020
310	((GEMS-0227/Ki14)/12)-080-001-002	GEMS-0314	Tropical Inbred	Thailand	Ames	2020
311	(GEMS-0227/(Mp494/GEMS-0002)-001-002-001-001)-SIB-138-001-002	GEMS-0315	Tropical Inbred/Mixed Tropical	Thailand/Mixed	Ames	2020
312	((KO679Y/GEMS-0030)/12)-090-001-001	GEMS-0316	Tropical Inbred	South Africa	Ames	2020
313	(GEMN-0097/(GEMN-0140/GEMN-0130))-002-001-002	GEMN-0317	Mixed Tropical//Dente Amarelo/Tropical Hybrid	Mixed/Brazil	Ames	2020
314	(GEMN-0097/TF-2-0-T3-P74-G121)-147-001-002	GEMN-0318	Mixed Tropical	Mixed	Ames	2020
315	Ki14:N4212-185-001-002	GEMN-0319	Tropical Inbred	Thailand	Ames	2020

Table 7. GEM Germplasm Releases

Entry	Pedigree	Code	Race	Country	Site	Year
316	La Posta Sequia C7 F71-1-1-1-2-B*4:S40b-B-031	GEMS-0320	Tropical Inbred	Mexico	NC	2021
317	La Posta Sequia C7 F71-1-1-1-2-B*4:S40b-B-018	GEMS-0321	Tropical Inbred	Mexico	NC	2021
318	KO679Y/GEMS-0030//794-015-001-001-B	GEMS-0322	Tropical Inbred	South Africa	Ames	2022
319	GEMS-0219//GEMS-0147/GEMS-0227-SIB-B-122-001-B	GEMS-0323	Creole/Tropical Inbred	Cuba/Thailand	Ames	2022
320	GEMS-0227/Ki14//41-002-001-001-B	GEMS-0324	Tropical Inbred	Thailand	Ames	2022
321	PHN46//GEMN-0130/Mp494//41-002-001-001-B	GEMN-0325	Tropical Inbred/Tropical Inbred	Brazil/Mixed	Ames	2022
322	GEMS-0220/CML373//R3212Z-069-002-001-B	GEMS-0326	Tuxpeño/Olotillo/Tropical Inbred	Mexico	Ames	2023
323	GEMS-0227/CML373//R3212Z-087-002-001-B	GEMS-0327	Tropical Inbred	Thailand/Mexico	Ames	2023
324	GEMS-0227/Ki14//GEMS-0218-040-001-001-B	GEMS-0328	Creole/Tropical Inbred	Thailand/Cuba	Ames	2023
325	GEMS-0227/Ki14//PHW51-005-001-001-B	GEMS-0329	Tropical Inbred	Thailand	Ames	2023
326	(GEMS-0050/CL-G1501:S17b-B-020)-003-01-B	GEMS-0330	Tropical Hybrid/Tropical Inbred	Mexico	NC	2024
327	GEMN-0135/GEMN-0137-002-02	GEMN-0331	Tropical Hybrid/Tusón	Brazil/St. Croix	NC	2024
328	GEMS-0227/42T1-B05-02	GEMS-0332	Tropical Inbred	Thailand	NC	2024
329	GEMS-0227/42T2-B44-01	GEMS-0333	Tropical Inbred	Thailand	NC	2024
330	La Posta Seq C7 F71-1-1-1-2:S40a/R3212Z-060-001-001-B	GEMS-0334	Tropical Inbred	Mexico	Ames	2024
331	PHHB4/KS23-6//2FACC-139-001-001-B	GEMS-0335	Tropical Inbred	Thailand	Ames	2024
332	PHHB9/KS23-6/PHW52-139-001-001-B	GEMS-0336	Tropical Inbred	Thailand	Ames	2024
1	DKXL212:N11a-139-001-001	DE EXP	Tropical Hybrid	Brazil	Deleware	2003
2	DE3 (DKXL212:N11a-191)	DE3	Tropical Hybrid	Brazil	Deleware	2002
3	DE4 (DKXL212:N11a-365)	DE4	Tropical Hybrid	Brazil	Deleware	2002
4	DE6 (DKXL212:N11a-234)	DE6	Tropical Hybrid	Brazil	Deleware	2005
5	NY212 (FS8B(T):N1802-212)	NY212	Mixed Tropical	Mixed	Cornell	2009
6	NY215 (FS8B(T):N1802-215)	NY215	Mixed Tropical	Mixed	Cornell	2009
7	NY266 (AR01150:N0406-266)	NY266	Dentado Blanco Rugoso	Argentina	Cornell	2009
8	Tx204 (AR01150:N0406)	Tx204	Dentado Blanco Rugoso	Argentina	Texas A&M	2004
9	Tx205 (AR01150:N0406)	Tx205	Dentado Blanco Rugoso	Argentina	Texas A&M	2004
10	W605S (AR17026:N1019)	W605S	Cristalino Colorado	Argentina	Wisconsin	2004
11	W606S (SCRO1:N1310)	W606S	St. Croix	St. Croix	Wisconsin	2009
12	W607S (BR52051:N04)	W607S	Dente Amarelo	Brazil	Wisconsin	2009
13	W608S (CH05015:N15)	W608S	Camelia	Chile	Wisconsin	2009
14	W609S (FS8B(T):N11a)	W609S	Mixed Tropical	Mixed	Wisconsin	2009
15	W610S (CUBA164:S2012)	W610S	Creole	Cuba	Wisconsin	2009
16	W615S (GEM Quality Syn. GQS C0)	W615S	Criollo/Argentino	Cuba	Wisconsin	2013
17	W616S (AR16026:S1719)	W616S	Cristalino Colorado	Argentina	Wisconsin	2013

Bolded codes are Crop Science Registered

Breeding Cross Observation

Table 8. 2023 Breeding Cross Observations - Raleigh, NC

Entry	Pedigree	Days to Anthesis	Days to Silking	Plant Height (cm)	Ear Height (cm)	Notes
1	2FACC/Celaya-GTO84//LH242	70	71	310	140	Discard
2	84BRQ4//LH195/55T3	70	71	250	108	Possibly plant in 2024 nursery
3	84BRQ4//LH195/55T6	68	70	275	125	Plant in 2024 nursery
4	84BRQ4//LH195/Celaya-GTO84	71	73	265	125	Possibly plant in 2024 nursery
5	84BRQ4//LH204/Tuxpeño-VER 147	70	71	275	118	Possibly plant in 2024 nursery
6	84QAB1//LH204/55T1	69	69	225	98	Probably discard
7	84QAB1//LH227/Tuxpeño-BVIR 153	72	73	288	120	Discard
8	84QAB1//PHW52/55T2	70	71	250	103	Probably discard
9	89343/LH214	68	69	300	140	Probably needs second cross
10	91BMA2//HC33/55T5	66	67	248	108	Possibly plant in 2024 nursery
11	91BMA2//HC33/55T6	64	65	245	110	Possibly plant in 2024 nursery
12	BR106/S42//GEMS-0050	69	70	260	125	Possibly plant in 2024 nursery
13	BR106/S42//GEMS-0281	70	70	270	115	Possibly plant in 2024 nursery
14	Canilla-Venezuela 981/N40x//GEMN-0048	66	67	270	135	Possibly plant in 2024 nursery, some ear rot concerns
15	Celaya-GTO84/LH228	73	75	323	150	Needs second cross
16	Celaya-GTO84/LH242	75	79	335	160	Needs second cross
17	Celaya-GTO84/PH37C	75	80	328	163	Needs second cross
18	Celaya-JAL167B/DK_90DJD28	67	69	315	148	Needs second cross
19	Celaya-JAL167B/PH37C	70	71	320	138	Needs second cross
20	CML341/S42//GEMS-0281	70	70	245	103	Planted in 2023 nursery
21	CML341/S42//GEMS-0298	69	70	258	110	Planted in 2023 nursery; silks out prematurely
22	CML341/S42//PH37C	70	70	263	103	Possibly plant in 2024 nursery
23	CML343/DK_FBL	74	74	293	133	Needs second cross
24	CML343/GEMS-0032//S40x///GEMS-0281	70	70	268	108	Possibly plant in 2024 nursery
25	CML343/GEMS-0032//S40x///PH37C	72	72	258	110	Possibly plant in 2024 nursery
26	CML343/PHHB9//GEMS-0281	70	70	273	113	Possibly plant in 2024 nursery
27	CML343/S42//GEMS-0281	72	72	250	98	Planted in 2023 nursery
28	CML373/PHHB9/LH244	72	73	283	105	Plant in 2024 nursery
29	CML373/S42//GEMS-0298	69	70	258	93	Planted in 2023 nursery
30	CML373/S42//PH37C	70	71	233	95	Possibly plant in 2024 nursery
31	CML376/GEMN-0310	70	70	280	135	Planted in 2023 nursery, EH a concern
32	CML449/GEMN-0310	67	67	270	140	Needs a second cross
33	CML494/GEMS-0032//S40x///GEMS-0281	69	70	253	113	Possibly plant in 2024 nursery
34	CML97//LH283/LH287	65	65	285	145	Needs a second cross, lodging a concern
35	CML97/GEMN-0310	65	67	275	135	Needs a second cross
36	CML97/LH214	69	69	305	160	Needs a second cross

Table 8. 2023 Breeding Cross Observations - Raleigh, NC

Entry	Pedigree	Days to Anthesis	Days to Silking	Plant Height (cm)	Ear Height (cm)	Notes
37	Coastal Tropical Flint-Barbados GP2/LH82//GEMN-0048	65	67	270	120	Planted in 2023 winter nursery
38	Coastal Tropical Flint-Barbados GP2/LH82//GEMN-0310	63	64	270	140	Possibly plant in 2024 nursery
39	Coastal Tropical Flint-Barbados GP2/LH82//LH287	64	65	275	130	Plant in 2024 nursery
40	Coastal Tropical Flint-Barbados GP2/PHVB2	70	70	310	165	Needs a second cross
41	Coastal Tropical Flint-Barbados GP2:N(LH82)/LH214	67	68	290	130	Possibly plant in 2024 nursery
42	Comun-Valle 343/N40x//GEMN-0048	66	67	280	120	Possibly plant in 2024 nursery
43	Comun-Valle 343/N40x//LH287	63	63	310	135	Possibly plant in 2024 nursery
44	Costeno/LH287	69	70	310	160	Ear height a concern, needs a second cross
45	Costeno/PHVB2	70	72	300	150	Ear height a concern, needs a second cross
46	Cubano Amarillo-Ucayali 12/N40x//GEMN-0048	67	69	280	125	Possibly plant in 2024 nursery
47	Cubano Amarillo-Ucayali 12/N40x//LH287	64	64	280	130	Possibly plant in 2024 nursery
48	DKB830/S51//GEMS-0050	71	73	268	113	Possibly plant in 2024 nursery
49	DKB830/S51//GEMS-0281	71	72	263	100	Possibly plant in 2024 nursery
50	DKB844/S51//GEMS-0050	74	74	268	125	Discard
51	DKB844/S51//GEMS-0281	70	71	275	118	Possibly plant in 2024 nursery
52	E.T.O. Blanco 244/LH287	67	67	295	145	Plant in 2024 nursery
53	E.T.O. Blanco 244/PHVB2	68	69	285	140	Needs second cross
54	FL_4BT7/GEMN-0310	66	67	290	130	Plant in 2024 nursery
55	GEMN-0048/NX20T0025//PH02T	68	68	275	130	Plant in 2024 nursery
56	GEMN-0048/NX20T0025//PH32C	66	67	285	125	
57	GEMN-0097/Cubano Amarillo Duro-Ucayali 12//GEMN-0310	65	67	265	140	Plant in 2024 nursery
58	GEMN-0097/Perla-Lima 13//GEMN-0310	66	67	280	130	Plant in 2024 nursery
59	GEMN-0104/Tx772	67	67	250	120	
60	GEMN-0272/Tx772	65	66	240	105	Planted in winter 2023 nursery
61	GEMN-0287/Tx772	64	65	255	115	Planted in winter 2023 nursery
62	GEMS-0050//CML343/S42	72	72	255	128	Possibly plant in 2024 nursery
63	GEMS-0050/GEMS-0226	73	74	258	118	Replant in 2024 Obs?
64	GEMS-0050/GEMS-0243	73	73	258	108	Replant in 2024 Obs?
65	GEMS-0050/GEMS-0245	71	72	265	115	Replant in 2024 Obs?
66	GEMS-0050/GEMS-0321	71	71	268	113	Replant in 2024 Obs?
67	GEMS-0115/NX20T0063//84QAB1	70	70	265	120	Probably discard
68	GEMS-0232/Tx772	67	67	270	120	Planted in winter 2023 nursery
69	GEMS-0245/GEMS-0320	73	74	295	133	Replant in 2024 Obs?
70	GEMS-0281//La Posta Sequia C7 F71-1-1-1-2-B*4/S40a	69	69	253	108	Planted in 2023 nursery
71	GEMS-0281//La Posta Sequia C7 F71-1-1-1-2-B*4/S40b	68	69	260	105	Planted in 2023 nursery
72	GEMS-0320/GEMS-0050	71	72	270	115	Replant in 2024 Obs?

Table 8. 2023 Breeding Cross Observations - Raleigh, NC

Entry	Pedigree	Days to Anthesis	Days to Silking	Plant Height (cm)	Ear Height (cm)	Notes
73	GS16(R)C1/GEMN-0310	66	66	300	135	Possibly plant in 2024 nursery
74	GS16(R)C1/LH287	65	65	300	130	Plant in 2024 nursery
75	HC33/55T4//LH242	73	73	258	118	Planted in 2023 nursery
76	HC33/55T5//LH242	71	72	253	118	Planted in 2023 nursery
77	ICA H-154//LH283/LH287	69	69	295	145	Do not replant
78	ICA V-106-#//LH283/LH287	67	69	275	125	Do not replant
79	La Posta Seq C7 F71-1-1-1-2-B*4//PHAG6/DK_FBLL	72	73	268	123	Decent
80	La Posta Seq C7 F71-1-1-1-2-B*4/S40a//GEMS-0298	69	70	248	100	Planted in 2023 nursery
81	La Posta Sequia C6-001)%B/DK_90DJD28	70	70	313	138	Needs second cross
82	La Posta Sequia C6-001)%B/LH228	70	70	278	128	Possibly plant in 2024 nursery
83	La Posta Sequia C6-001)%B/LH242	74	73	280	133	Possibly plant in 2024 nursery
84	La Posta Sequia C7 F71-1-1-1-2-B*4/S40b//GEMS-0298	68	69	250	93	Planted in 2023 nursery
85	LH216/TropHyb40//GEMN-0048	65	65	275	120	Possibly plant in 2024 nursery
86	LH227/55T4//LH242	73	73	250	103	Planted in 2023 nursery
87	LH283//LH213/55T5	65	65	270	140	Possibly plant in 2024 nursery
88	LH283/LH287//La Posta Seq C7 F64-1-1-1-1-B*3	66	66	290	150	
89	LH283/LH287//La Posta Seq C7 F71-1-1-1-2-B*4	65	65	285	135	
90	Lima 13/LH82//GEMN-0048	67	67	310	155	Possibly plant in 2024 nursery
91	NEI402020//PHAG6/DK_FBLL	75	76	275	128	
92	NEI402020//PHAG6/LH233	74	75	253	120	Possibly plant in 2024 nursery
93	Perla-Lima 13/LH82//LH214	64	65	290	140	Possibly plant in 2024 nursery
94	PH02T//LH185/55T4	67	67	245	125	Possibly plant in 2024 nursery
95	PH32C//PHR55/Coastal Tropical Flint-BVIR 104	65	67	290	135	Possibly plant in 2024 nursery
96	PH42B//HC33/55T6	69	69	260	110	Probably discard
97	PH42B//LH195/55T3	69	70	248	105	Probably discard
98	PHAG6//LH195//Tuson/Criollo-BVIR 155	73	75	283	128	Probably discard due to EH
99	PHAG6//LH204/55T1	69	73	245	98	Possibly plant in 2024 nursery
100	PHAG6//LH227/55T4	71	72	265	115	Probably discard
101	PHDG1//LH213/55T5	60	60	255	125	Poor husk cover, possibly plant in 2024 nursery
102	PHHB4/55T4//LH242	73	74	268	118	Already planted PHHB4/55T4//LH236 in nursery
103	PHK56/TropHyb40//GEMN-0048	69	70	320	135	Planted in winter 2023 nursery
104	PHK56/TropHyb40//LH214	66	67	285	125	Possibly plant in 2024 nursery
105	PHW52/55T1//LH242	69	70	275	118	Possibly plant in 2024 nursery
106	PHW52/55T2//LH242	71	71	243	103	Possibly plant in 2024 nursery
107	PHW52/55T4//LH242	71	71	265	118	Probably discard
108	PHW52/Celaya-GTO84//LH242	69	70	275	118	Possibly plant in 2024 nursery

Table 8. 2023 Breeding Cross Observations - Raleigh, NC

Entry	Pedigree	Days to Anthesis	Days to Silking	Plant Height (cm)	Ear Height (cm)	Notes
109	PHW52/Celaya-GTO84//LH244	69	71	295	130	Possibly plant in 2024 nursery
110	PHW52/GTO 36//LH242	68	68	295	133	Probably discard
111	PHW52/KS23(S)C5//LH242	68	69	263	115	Possibly plant in 2024 nursery
112	PHW52/KS23-5//LH242	68	69	258	98	Plant in 2024 nursery
113	Pioneer 1464 VYHR	65	66	270	120	
114	Pioneer 1464 VYHR	70	71	255	100	
115	PM-801/LH82//GEMN-0048	67	67	250	130	Plant in 2024 nursery
116	PM-801/LH82//LH214	65	66	275	125	Possibly plant in 2024 nursery?
117	Pool 25 C31-001)%B/LH287	65	66	280	140	Combine with Pool25GT and plant in 2024 nursery
118	Pool 33-128-01-01)%B//LH283/LH287	62	62	255	125	
119	Pool 33-128-01-01)%B/LH214	67	68	265	115	Planted in winter 2023 nursery
120	Pool25GT)%B/LH287	66	68	285	135	Combine with Pool C31 and plant in 2024 nursery
121	Pool26GT)%B/LH228	69	70	258	120	Possibly plant in 2024 nursery
122	Pool26GT)%B/LH242	70	71	295	133	Possibly plant in 2024 nursery
123	Pool33GT)%B/LH287	63	64	255	125	Possibly plant in 2024 nursery
124	Pool34GT)%B/DK 90DJD28	68	69	268	118	Possibly plant in 2024 nursery
125	POPEN 21 (IST) C2/PHP38//GEMS-0281	71	72	233	100	Possibly plant in 2024 nursery
126	POPEN 21 (IST) C2/PHP38//PH37C	73	73	245	118	Plant in 2024 nursery
127	POPULATION 21 (IST) C2/LH228	73	73	293	135	Needs second cross
128	POPULATION 21 (IST) C2/LH242	75	75	305	148	Needs second cross
129	Population 25 (IST) C2/GEMN-0310	66	68	265	128	Possibly needs second cross
130	Population 25 (IST) C2/LH287	65	66	295	135	Planted in winter 2023 nursery
131	Population 25 (IST) C2/PHVB2	67	68	280	135	Needs second cross
132	POPULATION 32 (IST) C2/LH185//GEMN-0048	65	65	270	115	Possibly plant in 2024 nursery
133	POPULATION 32 (IST) C2/LH185/GEMN-0310	65	65	260	125	Planted in winter 2023 nursery
134	POPULATION 33 (IST) C2/GEMN-0310	64	65	255	125	Plant in 2024 nursery
135	POPULATION 42 (IST) C2/GEMN-0310	65	66	275	140	Possibly plant in 2024 nursery
136	POPULATION 42 (IST) C2/LH287	64	64	290	140	Possibly plant in 2024 nursery
137	POPULATION 44 (IST) C2/DK_90DJD28	70	72	280	133	Possibly needs second cross
138	POPULATION 44 (IST) C2/PH37C	71	72	268	120	Possibly plant in 2024 nursery
139	Saint Croix GP3/LH82//GEMN-0048	66	67	275	125	Possibly plant in 2024 nursery
140	Saint Croix GP3/LH82//LH214	63	64	265	150	Planted in winter 2023 nursery
141	Saint Croix GP3/LH82//LH287	62	63	265	135	Possibly plant in 2024 nursery
142	Vandeno Synthetic/PH37C	72	73	318	153	Needs second cross

Table 9. 2023 Breeding Cross Observations - Ames, IA

Entry	HG	Pedigree	Pollen GDU	Silk GDU	Plant Height (cm)	Ear Height (cm)	Breeder Score
1	Ck	MBS3628/MBS9530	1223	1230	301	115	6
2	Ck	MBS3919/MBS5507	1225	1241	318	146	4
3	Ck	P0589	1213	1226	286	104	8
4	Ck	P1185	1250	1248	289	115	7
5	Ck	W4240	1209	1218	285	114	7
6	Ck	W7870	1238	1229	299	116	8
7	NSS	01HGI2//GEMN-0097/NX20T0066-B	1293	1303	315	140	5
8	NSS	01HGI2//GEMN-0238/NX20T0043-B	1315	1336	305	135	6
9	NSS	01HGI2//GEMN-0272/NX20T0079-B	1263	1293	333	140	3
10	NSS	01HGI4//GEMN-0104/NX20T0054-B	1349	1360	350	153	6
11	NSS	01HGI4//GEMN-0207/NX20T0041-B	1425	1491	343	160	4
12	NSS	01HGI4//GEMN-0272/NX20T0075-B	1325	1374	348	158	5
13	NSS	01INL1//GEMN-0097/NX20T0066-B	1274	1303	290	120	5
14	NSS	01INL1//GEMN-0238/NX20T0043-B	1336	1398	303	140	5
15	NSS	01INL1//GEMN-0272/NX20T0079-B	1293	1305	325	130	5
16	SS	17DHD16//GEMS-0050/NX20T0060-B	1315	1349	310	130	4
17	SS	17DHD16//GEMS-0093/NX20T0050-B	1315	1349	328	135	5
18	SS	17DHD16//GEMS-0113/NX20T0030-B	1303	1349	333	135	5
19	SS	17DHD16//GEMS-0311/NX20T0037-B	1336	1425	330	138	6
20	SS	17DHD16//GEMS-0312/NX20T0038-B	1315	1325	323	138	6
21	NSS	17INI20//GEMN-0124/NX20T0055-B	1284	1313	335	130	5
22	NSS	17INI20//GEMN-0257/NX20T0047-B	1360	1411	305	120	5
23	NSS	17INI20//GEMN-0302/NX20T0087-B	1293	1303	310	135	4
24	NSS	17INI30//GEMN-0207/NX20T0041-B	1372	1425	348	148	5
25	NSS	17INI30//GEMN-0272/NX20T0075-B	1284	1303	345	158	5
26	NSS	17INI30//GEMN-0302/NX20T0087-B	1254	1263	315	145	5
27	SS	17QFB1//GEMS-0050/NX20T0060-B	1263	1305	303	128	4
28	SS	17QFB1//GEMS-0093/NX20T0050-B	1325	1336	320	135	5
29	SS	17QFB1//GEMS-0294/NX20T0028-B	1411	1425	340	155	6
30	SS	17QFB1//GEMS-0311/NX20T0037-B	1384	1439	320	145	6
31	SS	17QFB1//GEMS-0312/NX20T0038-B	1359	1425	320	140	5
32	SS	22DHQ3//GEMS-0050/NX20T0060-B	1303	1325	310	143	5
33	SS	22DHQ3//GEMS-0093/NX20T0050-B	1360	1384	348	150	3
34	SS	22DHQ3//GEMS-0113/NX20T0030-B	1349	1399	340	158	5
35	SS	22DHQ3//GEMS-0115/NX20T0062-B	1325	1348	325	128	5
36	SS	22DHQ3//GEMS-0312/NX20T0038-B	1384	1411	333	140	4
37	NSS	4IBZ1A//GEMN-0257/NX20T0047-B	1384	1384	323	135	4
38	NSS	4IBZ1A//GEMN-0302/NX20T0087-B	1325	1360	340	130	5
39	SS	4SCQ3//GEMS-0050/NX20T0060-B	1315	1339	318	145	5
40	SS	4SCQ3//GEMS-0275/NX20T0027-B	1398	1452	335	148	4
41	SS	4SCQ3//GEMS-0294/NX20T0028-B	1411	1465	338	155	3
42	SS	4SCQ3//GEMS-0311/NX20T0037-B	1411	1465	338	165	3
43	SS	4SCQ3//GEMS-0312/NX20T0038-B	1360	1491	338	143	5
44	SS	87DIA4//GEMS-0113/NX20T0030-B	1226	1263	318	145	6
45	SS	87DIA4//GEMS-0115/NX20T0062-B	1233	1254	283	115	7
46	SS	87DIA4//GEMS-0142/NX20T0031-B	1273	1294	313	135	4
47	SS	87DIA4//GEMS-0255/NX20T0051-B	1283	1303	313	140	4

Table 9. 2023 Breeding Cross Observations - Ames, IA

Entry	HG	Pedigree	Pollen GDU	Silk GDU	Plant Height (cm)	Ear Height (cm)	Breeder Score
48	SS	90DJD28//GEMS-0258/NX20T0065-B	1425	1477	350	160	4
49	SS	90DJD28//GEMS-0275/NX20T0027-B	1349	1399	343	145	5
50	SS	90DJD28//GEMS-0294/NX20T0028-B	1360	1425	335	165	3
51	SS	90DJD28//GEMS-0311/NX20T0037-B	1349	1439	340	143	5
52	NSS	91INH2//GEMN-0097/NX20T0066-B	1274	1293	335	140	5
53	NSS	91INH2//GEMN-0270/NX20T0053-B	1374	1411	345	148	6
54	NSS	94INK1A//GEMN-0104/NX20T0054-B	1284	1325	338	130	4
55	NSS	94INK1A//GEMN-0254/NX20T0024-B	1293	1303	340	145	6
56	NSS	94INK1A//GEMN-0272/NX20T0075-B	1273	1273	328	143	6
57	SS	F298W//GEMS-0115/NX20T0062-B	1313	1359	310	125	4
58	NSS	GEMN-0048/NX20T0025//PH02T///01HGI2	1293	1303	320	130	3
59	NSS	GEMN-0048/NX20T0025//PH02T///01HGI4	1325	1349	333	148	3
60	NSS	GEMN-0048/NX20T0025//PH02T///01INL1	1325	1313	298	125	6
61	NSS	GEMN-0048/NX20T0025//PH02T///17INI20	1336	1325	325	143	6
62	NSS	GEMN-0048/NX20T0025//PH02T///91INH2	1284	1303	313	143	3
63	NSS	GEMN-0048/NX20T0025//PH02T///94INK1A	1243	1233	318	133	7
64	NSS	GEMN-0048/NX20T0025//PH02T///LH274	1273	1303	328	140	3
65	NSS	GEMN-0048/NX20T0025//PH02T///LH277	1284	1252	305	130	5
66	NSS	GEMN-0048/NX20T0025//PH32C///PH0KT	1325	1348	363	150	4
67	NSS	GEMN-0048/NX20T0025//PH32C///PH1GD	1243	1235	313	130	6
68	NSS	GEMN-0048/NX20T0025//PH32C///PH2EJ	1384	1425	348	155	5
69	NSS	GEMN-0048/NX20T0025//PH32C///PH3HH	1360	1438	315	135	6
70	NSS	GEMN-0048/NX20T0025//PHDG1///17INI30	1243	1252	293	123	5
71	NSS	GEMN-0048/NX20T0025//PHDG1///4IBZ1A	1233	1243	298	108	6
72	NSS	GEMN-0048/NX20T0025//PHDG1///91INH2	1243	1263	330	135	5
73	NSS	GEMN-0048/NX20T0025//PHDG1///94INK1A	1243	1243	310	128	7
74	NSS	GEMN-0048/NX20T0025//PHDG1///LH279	1273	1243	335	133	3
75	NSS	GEMN-0048/NX20T0025//PHDG1///LH293	1273	1293	338	153	5
76	NSS	GEMN-0048/NX20T0025//PHDG1///PH0KT	1303	1315	343	140	5
77	NSS	GEMN-0048/NX20T0025//PHDG1///PH1GD	1243	1284	320	130	6
78	NSS	GEMN-0048/NX20T0025//ZS0541///LH274	1235	1243	333	140	3
79	NSS	GEMN-0048/NX20T0025//ZS0541///LH277	1233	1243	300	130	7
80	NSS	GEMN-0048/NX20T0025//ZS0541///LH279	1263	1252	305	133	6
81	NSS	GEMN-0048/NX20T0025//ZS0541///LH293	1273	1274	330	135	4
82	NSS	GEMN-0048/NX20T0025//ZS0541///PH2EJ	1293	1313	338	148	6
83	NSS	GEMN-0048/NX20T0025//ZS0541///PH3HH	1315	1348	330	133	6
84	NSS	GEMN-0097/NX20T0067//LH280///01INL1	1252	1263	303	125	7
85	NSS	GEMN-0097/NX20T0067//LH280///17INI20	1233	1252	308	140	3
86	NSS	GEMN-0097/NX20T0067//LH280///17INI30	1226	1226	295	138	4
87	NSS	GEMN-0097/NX20T0067//LH280///4IBZ1A	1243	1252	310	125	8
88	NSS	GEMN-0097/NX20T0067//PH02T///01HGI2	1293	1313	305	130	3
89	NSS	GEMN-0097/NX20T0067//PH02T///01HGI4	1325	1349	298	125	5
90	NSS	GEMN-0097/NX20T0067//PH02T///PH50P	1252	1273	308	125	7
91	NSS	GEMN-0097/NX20T0067//PH02T///PH51H	1233	1263	310	135	5
92	NSS	GEMN-0098/NX20T0022//PH32C///91INH2	1305	1294	338	140	4
93	NSS	GEMN-0098/NX20T0022//PH32C///94INK1A	1226	1233	305	118	6
94	NSS	GEMN-0098/NX20T0022//PH32C///LH277	1243	1254	290	128	5

Table 9. 2023 Breeding Cross Observations - Ames, IA

Entry	HG	Pedigree	Pollen GDU	Silk GDU	Plant Height (cm)	Ear Height (cm)	Breeder Score
95	NSS	GEMN-0177/NX20T0056//PH03D///PH2EJ	1336	1336	345	158	4
96	NSS	GEMN-0177/NX20T0056//PH03D///PH3HH	1325	1336	313	143	5
97	NSS	GEMN-0177/NX20T0056//PH03D///PH50P	1243	1254	320	133	8
98	NSS	GEMN-0177/NX20T0056//PH03D///PH51H	1273	1294	320	138	8
99	NSS	GEMN-0177/NX20T0056//PH32C///LH279	1315	1303	333	145	6
100	NSS	GEMN-0177/NX20T0056//PH32C///LH293	1313	1336	338	140	6
101	NSS	GEMN-0177/NX20T0056//PH32C///PH0KT	1325	1336	353	160	5
102	NSS	GEMN-0177/NX20T0056//PH32C///PH1GD	1263	1273	323	143	3
103	NSS	GEMN-0178/NX20T0073//PH02T///LH274	1284	1313	333	150	4
104	NSS	GEMN-0178/NX20T0073//PH02T///LH277	1235	1263	308	135	7
105	NSS	GEMN-0178/NX20T0073//PH02T///LH279	1293	1252	315	135	7
106	NSS	GEMN-0178/NX20T0073//PH02T///LH293	1273	1303	325	145	3
107	NSS	GEMN-0178/NX20T0073//PHDG1///17INI30	1233	1233	308	120	6
108	NSS	GEMN-0178/NX20T0073//PHDG1///4IBZ1A	1233	1226	298	115	8
109	NSS	GEMN-0178/NX20T0073//PHDG1///91INH2	1254	1263	310	125	7
110	NSS	GEMN-0178/NX20T0073//PHDG1///94INK1A	1226	1233	308	123	8
111	NSS	GEMN-0178/NX20T0073//ZS1284///01HGI2	1233	1274	300	123	8
112	NSS	GEMN-0178/NX20T0073//ZS1284///01HGI4	1233	1263	300	120	5
113	NSS	GEMN-0178/NX20T0073//ZS1284///01INL1	1273	1285	295	128	6
114	NSS	GEMN-0178/NX20T0073//ZS1284///17INI20	1218	1226	298	118	6
115	NSS	GEMN-0238/NX20T0042//PHDG1///PH0KT	1273	1273	318	145	5
116	NSS	GEMN-0238/NX20T0042//PHDG1///PH1GD	1243	1293	295	123	4
117	NSS	GEMN-0238/NX20T0042//PHDG1///PH2EJ	1325	1336	323	140	5
118	NSS	GEMN-0238/NX20T0042//PHDG1///PH3HH	1325	1313	310	123	3
119	NSS	GEMN-0247/NX20T0045//PH0AA///01INL1	1252	1284	298	130	3
120	NSS	GEMN-0247/NX20T0045//PH0AA///17INI20	1243	1263	298	130	5
121	NSS	GEMN-0247/NX20T0045//PH0AA///17INI30	1243	1233	323	128	3
122	NSS	GEMN-0247/NX20T0045//PH0AA///4IBZ1A	1235	1233	325	123	3
123	NSS	GEMN-0247/NX20T0045//PH44G///01HGI2	1315	1374	313	143	4
124	NSS	GEMN-0247/NX20T0045//PH44G///01HGI4	1303	1336	320	143	3
125	NSS	GEMN-0247/NX20T0045//PH44G///PH50P	1263	1289	320	135	8
126	NSS	GEMN-0247/NX20T0045//PH44G///PH51H	1273	1294	320	145	3
127	NSS	GEMN-0247/NX20T0045//ZS0541///91INH2	1243	1284	315	135	5
128	NSS	GEMN-0247/NX20T0045//ZS0541///94INK1A	1233	1233	313	128	8
129	NSS	GEMN-0247/NX20T0045//ZS0541///LH274	1243	1243	310	133	7
130	NSS	GEMN-0247/NX20T0045//ZS0541///LH277	1233	1233	290	135	3
131	NSS	GEMN-0252/NX20T0029//PH32C///LH279	1273	1263	323	133	5
132	NSS	GEMN-0252/NX20T0029//PH32C///LH293	1263	1283	333	145	3
133	NSS	GEMN-0252/NX20T0029//PH32C///PH0KT	1294	1294	353	163	4
134	NSS	GEMN-0252/NX20T0029//PH32C///PH1GD	1252	1293	328	140	3
135	NSS	GEMN-0252/NX20T0029//PH44G///PH2EJ	1372	1398	355	160	5
136	NSS	GEMN-0252/NX20T0029//PH44G///PH3HH	1315	1349	320	140	3
137	NSS	GEMN-0252/NX20T0029//PH44G///PH50P	1235	1252	330	145	3
138	NSS	GEMN-0252/NX20T0029//PH44G///PH51H	1273	1294	318	153	3
139	NSS	GEMN-0266/NX20T0059//PH02T///01HGI2	1315	1360	325	153	3
140	NSS	GEMN-0266/NX20T0059//PH02T///01HGI4	1348	1336	320	158	3
141	NSS	GEMN-0266/NX20T0059//PH02T///01INL1	1303	1325	303	135	3

Table 9. 2023 Breeding Cross Observations - Ames, IA

Entry	HG	Pedigree	Pollen GDU	Silk GDU	Plant Height (cm)	Ear Height (cm)	Breeder Score
142	NSS	GEMN-0266/NX20T0059//PH02T///17INI20	1293	1313	300	125	5
143	NSS	GEMN-0266/NX20T0059//PH0HR///17INI30	1235	1263	298	128	6
144	NSS	GEMN-0266/NX20T0059//PH0HR///4IBZ1A	1243	1256	300	125	6
145	NSS	GEMN-0266/NX20T0059//PH0HR///91INH2	1235	1256	295	115	8
146	NSS	GEMN-0266/NX20T0059//PH0HR///94INK1A	1235	1263	313	133	8
147	NSS	GEMN-0286/NX20T0049//PH04G///01HGI2	1303	1349	315	150	5
148	NSS	GEMN-0286/NX20T0049//PH04G///01HGI4	1293	1336	315	153	3
149	NSS	GEMN-0286/NX20T0049//PH04G///PH50P	1273	1303	323	138	3
150	NSS	GEMN-0286/NX20T0049//PH04G///PH51H	1273	1273	315	145	3
151	NSS	GEMN-0286/NX20T0049//PH0HR///LH274	1252	1284	335	140	4
152	NSS	GEMN-0286/NX20T0049//PH0HR///LH277	1360	1385	323	148	4
153	NSS	GEMN-0286/NX20T0049//PH0HR///LH279	1293	1303	323	140	4
154	NSS	GEMN-0286/NX20T0049//PH0HR///LH293	1303	1313	340	153	4
155	NSS	GEMN-0286/NX20T0049//PH44G///PH0KT	1315	1348	348	155	5
156	NSS	GEMN-0286/NX20T0049//PH44G///PH1GD	1243	1273	315	135	5
157	NSS	GEMN-0286/NX20T0049//PH44G///PH2EJ	1384	1411	345	148	3
158	NSS	GEMN-0286/NX20T0049//PH44G///PH3HH	1349	1414	320	130	3
159	NSS	GEMN-0302/NX20T0088//PH44G///01INL1	1283	1303	298	115	6
160	NSS	GEMN-0302/NX20T0088//PH44G///17INI20	1273	1273	295	120	8
161	NSS	GEMN-0302/NX20T0088//PH44G///17INI30	1252	1273	313	125	7
162	NSS	GEMN-0302/NX20T0088//PH44G///4IBZ1A	1273	1294	313	130	7
163	SS	GEMS-0049/NX20T0026//84BRQ4///17QFB1	1284	1317	313	118	4
164	SS	GEMS-0049/NX20T0026//84BRQ4///90DJD28	1294	1313	313	133	3
165	SS	GEMS-0049/NX20T0026//84BRQ4///PH40B	1360	1384	325	133	5
166	SS	GEMS-0049/NX20T0026//84BRQ4///WDHQ11	1339	1376	330	138	6
167	SS	GEMS-0049/NX20T0026//PHAG6///17DHD16	1283	1326	293	125	5
168	SS	GEMS-0049/NX20T0026//PHAG6///87DIA4	1243	1252	310	130	8
169	SS	GEMS-0049/NX20T0026//PHAG6///PH42B	1263	1263	300	123	7
170	SS	GEMS-0049/NX20T0026//PHAG6///PHJ8R	1273	1303	318	150	4
171	SS	GEMS-0050/NX20T0061//01DIB2///01DIB2	1216	1226	268	115	6
172	SS	GEMS-0050/NX20T0061//01DIB2///4SCQ3	1243	1263	303	113	5
173	SS	GEMS-0050/NX20T0061//01DIB2///PH20A	1233	1263	318	140	3
174	SS	GEMS-0050/NX20T0061//01DIB2///PH2JR	1273	1303	303	113	5
175	SS	GEMS-0050/NX20T0061//PH25A///22DHQ3	1273	1294	298	138	3
176	SS	GEMS-0050/NX20T0061//PH25A///LH303	1246	1283	313	125	4
177	SS	GEMS-0050/NX20T0061//PH25A///PH25A	1303	1336	308	135	6
178	SS	GEMS-0050/NX20T0061//PH25A///WDHQ2	1294	1294	318	133	6
179	SS	GEMS-0115/NX20T0063//84QAB1///17DHD16	1252	1243	298	120	8
180	SS	GEMS-0115/NX20T0063//84QAB1///87DIA4	1233	1226	300	133	7
181	SS	GEMS-0115/NX20T0063//84QAB1///PH42B	1294	1273	310	125	8
182	SS	GEMS-0235/NX20T0019//PH20A///22DHQ3	1303	1336	325	135	5
183	SS	GEMS-0235/NX20T0019//PH20A///PH25A	1273	1303	330	150	3
184	SS	GEMS-0235/NX20T0019//PH20A///WDHQ2	1318	1343	345	148	6
185	SS	GEMS-0235/NX20T0019//PHEG9///01DIB2	1226	1233	310	125	7
186	SS	GEMS-0235/NX20T0019//PHEG9///4SCQ3	1348	1372	318	133	5
187	SS	GEMS-0235/NX20T0019//PHEG9///PH20A	1348	1425	338	145	3
188	SS	GEMS-0235/NX20T0019//PHEG9///PH2JR	1387	1462	308	123	5

Table 9. 2023 Breeding Cross Observations - Ames, IA

Entry	HG	Pedigree	Pollen GDU	Silk GDU	Plant Height (cm)	Ear Height (cm)	Breeder Score
189	SS	GEMS-0235/NX20T0019//RQAA8///17QFB1	1284	1303	313	130	5
190	SS	GEMS-0235/NX20T0019//RQAA8///90DJD28	1263	1263	300	123	8
191	SS	GEMS-0235/NX20T0019//RQAA8///PH40B	1372	1425	330	145	3
192	SS	GEMS-0235/NX20T0019//RQAA8///WDHQ11	1414	1450	343	148	4
193	SS	GEMS-0263/NX20T0057//01DIB2///17DHD16	1243	1283	285	125	3
194	SS	GEMS-0263/NX20T0057//01DIB2///87DIA4	1218	1226	285	118	5
195	SS	GEMS-0263/NX20T0057//01DIB2///PH42B	1283	1303	315	128	4
196	SS	GEMS-0263/NX20T0057//01DIB2///PHJ8R	1243	1252	300	130	7
197	SS	GEMS-0263/NX20T0057//84BRQ4///22DHQ3	1254	1273	323	138	3
198	SS	GEMS-0263/NX20T0057//84BRQ4///LH303	1273	1303	315	133	3
199	SS	GEMS-0263/NX20T0057//84BRQ4///PH25A	1284	1294	318	135	5
200	SS	GEMS-0263/NX20T0057//84BRQ4///WDHQ2	1349	1362	335	148	6
201	SS	GEMS-0263/NX20T0057//PHAG6///17QFB1	1254	1284	298	120	6
202	SS	GEMS-0263/NX20T0057//PHAG6///90DJD28	1263	1263	288	115	7
203	SS	GEMS-0263/NX20T0057//PHAG6///PH40B	1325	1336	333	135	3
204	SS	GEMS-0263/NX20T0057//PHAG6///WDHQ11	1326	1376	333	135	4
205	SS	GEMS-0281/NX20T0032//01DIB2///01DIB2	1243	1233	295	115	7
206	SS	GEMS-0281/NX20T0032//01DIB2///4SCQ3	1263	1273	283	120	7
207	SS	GEMS-0281/NX20T0032//01DIB2///PH20A	1284	1294	338	133	3
208	SS	GEMS-0281/NX20T0032//01DIB2///PH2JR	1273	1315	298	110	3
209	SS	GEMS-0281/NX20T0032//PH20A///17DHD16	1294	1352	330	125	4
210	SS	GEMS-0281/NX20T0032//PH20A///87DIA4	1243	1263	330	145	4
211	SS	GEMS-0281/NX20T0032//PH20A///PH42B	1339	1376	308	135	3
212	SS	GEMS-0281/NX20T0032//PH20A///PHJ8R	1303	1336	335	148	3
213	SS	GEMS-0281/NX20T0032//PH25A///22DHQ3	1284	1303	325	133	4
214	SS	GEMS-0281/NX20T0032//PH25A///LH303	1254	1263	320	135	6
215	SS	GEMS-0281/NX20T0032//PH25A///PH25A	1315	1359	320	128	3
216	SS	GEMS-0281/NX20T0032//PH25A///WDHQ2	1293	1325	315	135	6
217	SS	GEMS-0281/NX20T0032//RQAA8///17QFB1	1273	1283	308	123	6
218	SS	GEMS-0281/NX20T0032//RQAA8///90DJD28	1263	1315	313	128	3
219	SS	GEMS-0281/NX20T0032//RQAA8///PH40B	1336	1349	330	143	5
220	SS	GEMS-0281/NX20T0032//RQAA8///WDHQ11	1339	1332	303	120	3
221	SS	GEMS-0282/NX20T0033//84QAB1///17DHD16	1263	1285	285	115	7
222	SS	GEMS-0282/NX20T0033//84QAB1///87DIA4	1226	1243	320	130	6
223	SS	GEMS-0282/NX20T0033//84QAB1///PH42B	1325	1348	323	128	3
224	SS	GEMS-0282/NX20T0033//84QAB1///PHJ8R	1294	1339	343	150	4
225	SS	GEMS-0282/NX20T0033//PHAG6///22DHQ3	1243	1284	300	123	3
226	SS	GEMS-0282/NX20T0033//PHAG6///LH303	1233	1273	328	140	5
227	SS	GEMS-0282/NX20T0033//PHAG6///PH25A	1315	1413	335	133	5
228	SS	GEMS-0282/NX20T0033//PHAG6///WDHQ2	1303	1325	325	138	6
229	SS	GEMS-0282/NX20T0033//PHEG9///17QFB1	1303	1303	303	120	3
230	SS	GEMS-0282/NX20T0033//PHEG9///90DJD28	1243	1273	310	138	6
231	SS	GEMS-0282/NX20T0033//PHEG9///PH40B	1372	1398	328	133	3
232	SS	GEMS-0282/NX20T0033//PHEG9///WDHQ11	1273	1294	310	130	5
233	SS	GEMS-0282/NX20T0033//RQAA8///01DIB2	1226	1226	285	125	7
234	SS	GEMS-0282/NX20T0033//RQAA8///4SCQ3	1293	1303	290	118	3
235	SS	GEMS-0282/NX20T0033//RQAA8///PH20A	1360	1385	330	135	3

Table 9. 2023 Breeding Cross Observations - Ames, IA

Entry	HG	Pedigree	Pollen GDU	Silk GDU	Plant Height (cm)	Ear Height (cm)	Breeder Score
236	SS	GEMS-0282/NX20T0033//RQAA8//PH2JR	1313	1360	288	123	3
237	SS	GEMS-0284/NX20T0034//84BRQ4//01DIB2	1273	1273	323	133	4
238	SS	GEMS-0284/NX20T0034//84BRQ4//4SCQ3	1336	1374	318	135	3
239	SS	GEMS-0284/NX20T0034//84BRQ4//PH20A	1252	1263	320	140	5
240	SS	GEMS-0284/NX20T0034//84BRQ4//PH2JR	1305	1336	313	130	4
241	SS	GEMS-0284/NX20T0034//F298W//17QFB1	1284	1284	308	120	8
242	SS	GEMS-0284/NX20T0034//F298W//90DJD28	1263	1284	318	148	3
243	SS	GEMS-0284/NX20T0034//F298W//PH40B	1303	1325	345	155	3
244	SS	GEMS-0284/NX20T0034//F298W//WDHQ11	1263	1283	320	133	4
245	SS	GEMS-0284/NX20T0034//PH42B//17DHD16	1360	1362	338	148	4
246	SS	GEMS-0284/NX20T0034//PH42B//PH42B	1372	1398	318	123	6
247	SS	GEMS-0284/NX20T0034//PH42B//PHJ8R	1273	1305	328	153	3
248	SS	GEMS-0284/NX20T0034//RQAA8//22DHQ3	1283	1294	323	140	3
249	SS	GEMS-0284/NX20T0034//RQAA8//LH303	1263	1273	308	125	5
250	SS	GEMS-0284/NX20T0034//RQAA8//PH25A	1284	1303	310	130	3
251	SS	GEMS-0284/NX20T0034//RQAA8//WDHQ2	1273	1283	325	128	5
252	SS	GEMS-0288/NX20T0020//01DIB2//17DHD16	1226	1233	280	113	5
253	SS	GEMS-0288/NX20T0020//01DIB2//87DIA4	1233	1254	290	125	5
254	SS	GEMS-0288/NX20T0020//01DIB2//PH42B	1273	1294	318	123	5
255	SS	GEMS-0288/NX20T0020//01DIB2//PHJ8R	1243	1243	310	133	7
256	SS	GEMS-0288/NX20T0020//91BMA2//17QFB1	1233	1252	295	113	7
257	SS	GEMS-0288/NX20T0020//91BMA2//90DJD28	1233	1254	320	123	4
258	SS	GEMS-0288/NX20T0020//91BMA2//PH40B	1360	1349	365	163	4
259	SS	GEMS-0288/NX20T0020//91BMA2//WDHQ11	1303	1315	333	140	5
260	SS	GEMS-0288/NX20T0020//PH40B//01DIB2	1263	1263	300	125	7
261	SS	GEMS-0288/NX20T0020//PH40B//4SCQ3	1284	1303	308	120	3
262	SS	GEMS-0288/NX20T0020//PH40B//PH20A	1360	1411	338	150	3
263	SS	GEMS-0288/NX20T0020//PH40B//PH2JR	1384	1439	325	125	5
264	SS	GEMS-0288/NX20T0020//PH42B//22DHQ3	1293	1303	325	135	5
265	SS	GEMS-0288/NX20T0020//PH42B//LH303	1273	1294	325	133	3
266	SS	GEMS-0288/NX20T0020//PH42B//PH25A	1315	1325	320	135	6
267	SS	GEMS-0288/NX20T0020//PH42B//WDHQ2	1360	1385	343	138	6
268	SS	GEMS-0289/NX20T0021//PH20A//17DHD16	1263	1283	298	125	7
269	SS	GEMS-0289/NX20T0021//PH20A//87DIA4	1233	1243	310	130	7
270	SS	GEMS-0289/NX20T0021//PH20A//PH42B	1303	1336	323	133	5
271	SS	GEMS-0289/NX20T0021//PH20A//PHJ8R	1349	1374	343	145	3
272	SS	GEMS-0289/NX20T0021//PH42B//01DIB2	1233	1252	300	130	7
273	SS	GEMS-0289/NX20T0021//PH42B//4SCQ3	1305	1326	308	130	4
274	SS	GEMS-0289/NX20T0021//PH42B//PH20A	1325	1349	333	148	3
275	SS	GEMS-0289/NX20T0021//PH42B//PH2JR	1360	1399	310	125	6
276	SS	GEMS-0301/NX20T0058//84BRQ4//22DHQ3	1315	1336	315	128	3
277	SS	GEMS-0301/NX20T0058//84BRQ4//LH303	1263	1285	328	138	3
278	SS	GEMS-0301/NX20T0058//84BRQ4//PH25A	1360	1411	338	143	6
279	SS	GEMS-0301/NX20T0058//84BRQ4//WDHQ2	1325	1360	348	138	4
280	SS	GEMS-0301/NX20T0058//PH20A//17QFB1	1273	1284	310	120	8
281	SS	GEMS-0301/NX20T0058//PH20A//90DJD28	1305	1360	325	138	5
282	SS	GEMS-0301/NX20T0058//PH20A//PH40B	1360	1385	338	145	3

Table 9. 2023 Breeding Cross Observations - Ames, IA

Entry	HG	Pedigree	Pollen GDU	Silk GDU	Plant Height (cm)	Ear Height (cm)	Breeder Score
283	SS	GEMS-0301/NX20T0058//PH20A//WDHQ11	1305	1376	320	133	3
284	SS	GEMS-0301/NX20T0058//PH25A//01DIB2	1226	1243	275	115	5
285	SS	GEMS-0301/NX20T0058//PH25A//4SCQ3	1254	1266	308	135	5
286	SS	GEMS-0301/NX20T0058//PH25A//PH20A	1305	1360	333	130	3
287	SS	GEMS-0301/NX20T0058//PH25A//PH2JR	1303	1336	305	133	5
288	SS	GEMS-0307/NX20T0035//84QAB1//17DHD16	1325	1349	303	123	5
289	SS	GEMS-0307/NX20T0035//84QAB1//87DIA4	1274	1293	318	130	3
290	SS	GEMS-0307/NX20T0035//84QAB1//PH42B	1325	1372	328	138	4
291	SS	GEMS-0307/NX20T0035//84QAB1//PHJ8R	1384	1384	345	140	6
292	SS	GEMS-0307/NX20T0035//PH25A//22DHQ3	1284	1294	313	140	7
293	SS	GEMS-0307/NX20T0035//PH25A//LH303	1254	1273	298	133	6
294	SS	GEMS-0307/NX20T0035//PH25A//PH25A	1313	1325	313	125	3
295	SS	GEMS-0307/NX20T0035//PH25A//WDHQ2	1274	1283	308	128	7
296	SS	GEMS-0307/NX20T0035//PH40B//17QFB1	1303	1336	305	118	4
297	SS	GEMS-0307/NX20T0035//PH40B//90DJD28	1273	1372	308	120	3
298	SS	GEMS-0307/NX20T0035//PH40B//PH40B	1384	1384	320	140	5
299	SS	GEMS-0307/NX20T0035//PH40B//WDHQ11	1325	1359	325	133	3
300	SS	GEMS-0307/NX20T0035//PH42B//01DIB2	1336	1336	335	133	5
301	SS	GEMS-0307/NX20T0035//PH42B//4SCQ3	1293	1303	290	128	6
302	SS	GEMS-0307/NX20T0035//PH42B//PH20A	1349	1374	333	148	6
303	SS	GEMS-0307/NX20T0035//PH42B//PH2JR	1305	1326	310	128	4
304	NSS	LH262//LH168/CML384//PH38B	1360	1376	338	150	3
305	NSS	LH274//GEMN-0097/NX20T0066-B	1226	1263	310	135	8
306	NSS	LH274//GEMN-0238/NX20T0043-B	1336	1348	350	150	4
307	NSS	LH274//GEMN-0270/NX20T0053-B	1325	1360	340	150	5
308	NSS	LH277//GEMN-0124/NX20T0055-B	1263	1305	310	133	4
309	NSS	LH277//GEMN-0238/NX20T0043-B	1315	1339	295	135	4
310	NSS	LH277//GEMN-0272/NX20T0079-B	1226	1252	315	148	3
311	NSS	LH279//GEMN-0178/NX20T0072-B	1303	1303	320	135	6
312	NSS	LH279//GEMN-0270/NX20T0053-B	1336	1348	345	145	4
313	NSS	LH293//GEMN-0207/NX20T0041-B	1425	1477	353	155	3
314	NSS	LH293//GEMN-0272/NX20T0075-B	1325	1372	348	150	5
315	SS	LH303//GEMS-0258/NX20T0064-B	1372	1425	330	140	6
316	SS	LH303//GEMS-0258/NX20T0065-B	1438	1465	343	165	3
317	SS	LH303//GEMS-0275/NX20T0027-B	1384	1515	350	155	4
318	SS	LH303//GEMS-0294/NX20T0028-B	1398	1425	350	150	4
319	NSS	NP2031//GEMN-0104/NX20T0054-B	1384	1398	360	160	3
320	NSS	PH03D//GEMN-0124/NX20T0055-B	1294	1315	315	133	6
321	NSS	PH04G//GEMN-0157/NX20T0039-B	1303	1336	340	145	6
322	NSS	PH04G//GEMN-0270/NX20T0053-B	1360	1385	358	158	4
323	NSS	PH04G//GEMN-0302/NX20T0088-B	1273	1336	335	143	4
324	SS	PH05F//GEMS-0115/NX20T0063-B	1284	1325	333	145	6
325	SS	PH09B//GEMS-0255/NX20T0051-B	1348	1359	325	150	5
326	SS	PH09B//GEMS-0307/NX20T0035-B	1336	1372	333	140	5
327	NSS	PH0HR//GEMN-0285/NX20T0048-B	1273	1303	323	143	4
328	NSS	PH0KT//GEMN-0124/NX20T0055-B	1303	1315	355	155	6
329	NSS	PH0KT//GEMN-0257/NX20T0047-B	1425	1439	368	183	3

Table 9. 2023 Breeding Cross Observations - Ames, IA

Entry	HG	Pedigree	Pollen GDU	Silk GDU	Plant Height (cm)	Ear Height (cm)	Breeder Score
330	NSS	PH0KT//GEMN-0272/NX20T0079-B	1273	1293	355	150	6
331	NSS	PH17C//GEMN-0238/NX20T0042-B	1293	1313	358	148	6
332	NSS	PH17C//GEMN-0286/NX20T0049-B	1336	1385	348	158	5
333	NSS	PH1GD//GEMN-0254/NX20T0024-B	1315	1360	330	150	4
334	NSS	PH1GD//GEMN-0287/NX20T0080-B	1254	1303	360	163	6
335	NSS	PH2EJ//GEMN-0104/NX20T0054-B	1452	1465	355	180	3
336	NSS	PH2EJ//GEMN-0254/NX20T0024-B	1465	1465	370	175	3
337	NSS	PH2EJ//GEMN-0287/NX20T0080-B	1384	1438	320	173	5
338	SS	PH2JR//GEMS-0142/NX20T0031-B	1336	1372	338	148	5
339	SS	PH2JR//GEMS-0255/NX20T0051-B	1398	1438	350	150	6
340	SS	PH2JR//GEMS-0258/NX20T0064-B	1398	1452	338	145	5
341	SS	PH2JR//GEMS-0258/NX20T0065-B	1411	1452	340	160	6
342	NSS	PH32C//GEMN-0238/NX20T0043-B	1336	1372	330	150	4
343	NSS	PH32C//GEMN-0287/NX20T0080-B	1348	1372	368	153	3
344	NSS	PH3HH//GEMN-0178/NX20T0072-B	1372	1439	343	155	5
345	NSS	PH3HH//GEMN-0254/NX20T0024-B	1359	1438	325	135	4
346	NSS	PH3HH//GEMN-0287/NX20T0080-B	1360	1504	345	148	4
347	NSS	PH50P//GEMN-0207/NX20T0041-B	1325	1372	358	158	4
348	NSS	PH50P//GEMN-0257/NX20T0047-B	1315	1359	363	163	4
349	NSS	PH50P//GEMN-0302/NX20T0087-B	1273	1303	308	133	4
350	NSS	PH51H//GEMN-0178/NX20T0072-B	1226	1235	328	138	5
351	NSS	PH51H//GEMN-0270/NX20T0053-B	1293	1336	345	153	5
352	NSS	PH51H//GEMN-0287/NX20T0080-B	1315	1336	333	150	4
353	SS	PH79A//PHHB4/Ki20//LH242	1303	1313	315	140	4
354	SS	PHAG6//GEMS-0050/NX20T0060-B	1315	1374	300	130	4
355	SS	PHJ8R//GEMS-0255/NX20T0051-B	1384	1411	350	153	4
356	SS	PHJ8R//GEMS-0258/NX20T0064-B	1438	1504	365	163	5
357	SS	PHJ8R//GEMS-0258/NX20T0065-B	1489	1528	370	190	4
358	SS	PHJ8R//GEMS-0275/NX20T0027-B	1438	1504	338	163	4
359	SS	PHKV0//PHHB4/Ki20//PH42B	1273	1303	308	140	5
360	SS	PHKV0//GEMS-0281/NX20T0032-B	1336	1336	325	153	5
361	SS	PHKV0//GEMS-0284/NX20T0034-B	1274	1293	315	150	4
362	SS	WDHQ11//GEMS-0115/NX20T0062-B	1303	1325	318	145	6
363	SS	WDHQ11//GEMS-0142/NX20T0031-B	1336	1348	328	145	4
364	SS	WDHQ11//GEMS-0255/NX20T0051-B	1360	1374	340	148	6
365	SS	WDHQ11//GEMS-0258/NX20T0064-B	1452	1516	335	155	3
366	SS	WDHQ2//GEMS-0093/NX20T0050-B	1339	1348	340	148	6
367	SS	WDHQ2//GEMS-0113/NX20T0030-B	1360	1360	348	155	5
368	SS	WDHQ2//GEMS-0115/NX20T0062-B	1385	1411	318	140	4
369	SS	WDHQ2//GEMS-0142/NX20T0031-B	1372	1372	343	143	3
370	NSS	ZS1284//GEMN-0097/NX20T0066-B	1226	1254	290	120	5

Trial Information:

Planting Date: May 18, 2023

Location: Ames, IA

Disease Screening

Table 10. 2023 GEM Disease Trial Summary

Entry	Pedigree	Corteva			Wyffels
		Fusarium Ear Rot	Head Smut	NLB	Goss's Wilt
1	01DIB2	5	97.5	1	7
2	B73		94.5	3	7.5
3	LH291	3.5	81.5	1	6
4	MBWZ		80	5	7
5	PH03D		71		8
6	PH42B		95	5	7.5
7	PHP02	2	86	3.5	7
8	PHW52	3	93	3	7
9	WQCD10	5	89	5.5	7.5
10	GEMN-0097	6	91.5	6	7.5
11	GEMN-0178	5.5	97.5	5.5	8
12	GEMN-0267	5	87	5	4
13	GEMN-0285	3.5	69.5	6	7
14	GEMN-0286	4.5	88	6	6.5
15	GEMN-0287	5	74	6	8
16	GEMN-0292	5.5	97.5	6	7.5
17	GEMN-0310	5.5	78.5	6	8
18	GEMN-0325	5	84	5.5	7.5
19	GEMS-0050	5	97.5	5.5	8
20	GEMS-0115		100	4.5	7.5
21	GEMS-0227		79	5.5	8
22	GEMS-0248		100	5.5	
23	GEMS-0251	5	100	4.5	8
24	GEMS-0258	5.5	92.5	5.5	8
25	GEMS-0264	5	95	4	7
26	GEMS-0268	6	94.5	5	7
27	GEMS-0269	4.5	78.5	6	7
28	GEMS-0275	6	63.5	5.5	8
29	GEMS-0279		100	5	7.5
30	GEMS-0280	5	93	6.5	6.5
31	GEMS-0281	5	84	6	7.5
32	GEMS-0282	5	90	5	7
33	GEMS-0283	5	100	5	
34	GEMS-0284		65.5	4	6
35	GEMS-0293	6	100	6	8
36	GEMS-0294	6	53.5	7	7.5
37	GEMS-0295	6.5	100	5	8
38	GEMS-0311	5.5	71.5	5	8
39	GEMS-0312	5	40	5.5	3.5
40	GEMS-0320	5.5	90	5.5	7

Table 10. 2023 GEM Disease Trial Summary

Entry	Pedigree	Corteva			Wyffels
		Fusarium Ear Rot	Head Smut	NLB	Goss's Wilt
46	GEMS-0327		92		7.5
47	GEMS-0328	5	66.5	5	7.5
48	GEMS-0329	5	84.5	6	7.5
49	GEMS-0334	5	87.5	6	
50	GEMS-0335	5	97.5	5.5	
51	GEMS-0336	4.5		3.5	

Corteva Legend:

Fusarium Ear Rot: 1-9, 9 = best

Head Smut: % of plants without smut

Northern Leaf Blight: 1-9, 9 = best

Wyffels Legend:

Goss's Bacterial Wilt: 1-9, 9 = best

Yield Trials

Table 11. 2023 GEM-Raleigh Yield Trial Summary

Trial	Year	Experimental Pedigree(s)	Tester	# of Locations*	# of Experimental Entries
23NCG07	1st	AC454/LH213, Ki21/DK_HBA1, F45/DK_HBA1, and F45/NC290	MBS3520	6	53
23NCG08	1st	GEMN-0272/GEMN-0104 and GEMN-0287/GEMN-0272	MBS3520, PC2754	6	22
23NCG09	1st	G17(C34)HS208+Pool 33-128/LH213 and CML449/GEMN-0097//40x	MBS3520	6	39
23NCG10	1st	La Posta Sequia C7 F96/LH193	MBS6717	6	52
23NCG11	1st	La Posta Sequia C7 F71-1-1-1-2-B*4:S40a	MBS6717	9	49
23NCG12	1st	GEMS-0255/GEMS-0115	MBS8731	6	44
23NCG13	1st	GEMN releases	MBS2887; MBS3520; MBS3640GT; PC2754	12 (12)	58
23NCG14	1st	GEMS releases	MBS6717;MBS8731	12 (12)	39
23NCG15	1st	GEMS-0293/GEMS-0281	MBS6717	5	59
23NCG16	1st	GEMS-0293/GEMS-0281	MBS6717	5	58
23NCG17	1st	GEMS-0281/GEMS-0311	MBS6717	5	59
23NCG18	1st	GEMS-0281/GEMS-0311	MBS6717	5	49
23NCG21	1st	La Posta Sequia C7 F64-1-1-1-2-B*4:S40a and La Posta Sequia C7 F64-1-1-1-2-B*4:S40b	MBS8731	3 (2)	72
23NCGE2	1st	Tropical inbreds and Tx772	MBS6717; PC2754	10 (10)	25
23NCG05	1st/2nd	GEMN x GEMN, CA00370:N(GEMN-0097)40x and CML449:N(GEMN-0097)40x	MBS3520; MBS3640GT; PC2754	9 (6)	16
23NCG06	1st/2nd	GEMS x GEMS, CML x ex-PVP, and other exotic x SSS combinations	MBS6717; MBS8731	9 (7)	51
23NCGE1	1st/2nd	Tropical inbreds and germplasm lines	ex-PVP x ex-PVP	11 (9)	43
23NCGP1	1st/2nd	DeKalb, Syngenta and Holden's nSSS ex-PVPs and southern inbreds	MBS2887; MBS3520; PC2754	4 (4)	58
23NCGP2	1st/2nd	Corteva nSSS ex-PVPs	MBS2887; MBS3520; PC2754	4 (3)	54
23NCGP3	1st/2nd	DeKalb, Syngenta and Holden's SSS ex-PVPs	MBS6717; MBS8731	4 (4)	51
23NCGP4	1st/2nd	Corteva SSS ex-PVPs	MBS6717; MBS8731	4 (4)	54
23NCG01	2nd	GEMS-0027/GEMS-0220 and GEMS-0050/CL-G1501:S17b-B-020	MBS6717; MBS8731	14 (11)	26
23NCG02	2nd	GEMN x GEMN combinations	MBS3520; MBS3640GT; PC2754	13 (11)	42
23NCG03	2nd	AC454/LH213, F45/DK_HBA1, and F45/NC290	MBS3520; MBS3640GT; PC2754	14 (12)	26
23NCG04	2nd	GEMS-0227/42T1 and GEMS-0227/42T2	MBS6717; MBS8731	14 (13)	42

*number of locations planted (number of locations used in analysis); 23NCG07 thru 23NCG12 and 23NCG15 thru 23NCG18 have yet to be analyzed.

Table 12. 23NCG01 GEM-Raleigh

Entry	Pedigree	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight (lbs/bu)	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
1	GEMS-0027/GEMS-0220)-06-01//MBS8731	207	97	21.4	9.7	52.9	3.0	1.3	98	305	139
2	GEMS-0027/GEMS-0220)-06-01//MBS6717	189	89	21.5	9.1	53.6	1.4	0.7	99	290	126
3	GEMS-0027/GEMS-0220)-06-02//MBS8731	213	100	20.9	10.3	52.1	0.7	0.0	100	304	139
4	GEMS-0027/GEMS-0220)-06-02//MBS6717	187	88	20.2	9.5	54.4	5.3	1.3	100	285	123
5	CL-G1501:S17b-B-020)%B/MBS8731	211	99	20.1	10.6	52.2	1.6	3.3	99	301	136
6	CL-G1501:S17b-B-020)%B/MBS6717	176	83	20.1	8.8	54.3	2.3	0.7	99	294	121
7	(GEMS-0050/CL-G1501:S17b-B-020)-003-01-B//MBS8731	212	100	20.8	10.3	51.3	0.3	3.2	100	304	139
8	(GEMS-0050/CL-G1501:S17b-B-020)-003-01-B//MBS6717	190	90	19.7	9.9	52.7	0.7	2.6	97	294	129
9	(CL-G1501:S17b-B-020/GEMS-0050)-011-01-B//MBS8731	200	94	20.1	10.1	51.1	2.8	1.5	97	302	135
10	(CL-G1501:S17b-B-020/GEMS-0050)-011-01-B//MBS6717	185	87	20.3	9.1	53.3	3.0	1.2	96	301	133
11	(CL-G1501:S17b-B-020/GEMS-0050)-011-02-B//MBS8731	205	96	20.7	9.9	51.8	3.2	0.5	100	316	141
12	(CL-G1501:S17b-B-020/GEMS-0050)-011-02-B//MBS6717	184	87	21.1	8.7	53.6	3.5	1.8	98	292	130
13	GEMS-0027/GEMS-0220)-03-05-B//MBS8731	226	106	22.0	10.5	51.5	0.7	0.2	100	306	137
14	GEMS-0027/GEMS-0220)-03-05-B//MBS6717	182	86	20.9	8.8	53.9	2.8	1.7	99	286	119
15	(GEMS-0050/CL-G1501:S17b-B-020)-004-01//MBS8731	199	93	19.4	10.5	52.8	4.9	0.8	94	274	142
16	(GEMS-0050/CL-G1501:S17b-B-020)-004-01//MBS6717	178	84	19.8	9.2	54.0	4.2	1.3	100	283	134
17	(GEMS-0050/CL-G1501:S17b-B-020)-008-05//MBS8731	206	97	21.4	9.7	53.0	9.6	0.0	99	301	134
18	(GEMS-0050/CL-G1501:S17b-B-020)-008-05//MBS6717	187	88	20.6	9.3	54.5	2.8	4.2	100	291	123
19	(CL-G1501:S17b-B-020/GEMS-0050)-004-03//MBS8731	203	96	21.8	9.5	50.3	2.2	1.0	100	311	141
20	(CL-G1501:S17b-B-020/GEMS-0050)-004-03//MBS6717	187	88	21.3	8.7	53.1	0.5	2.5	99	296	132
21	GEMS-0027/MBS8731	199	94	21.5	9.4	52.7	1.3	1.0	98	317	146
22	GEMS-0027/MBS6717	187	88	20.3	9.3	54.1	3.6	7.0	99	306	133
23	GEMS-0050/MBS8731	203	95	21.4	9.5	51.6	2.3	2.0	100	304	145
24	GEMS-0050/MBS6717	169	80	21.0	8.1	52.9	3.9	4.3	99	286	127
25	GEMS-0220/MBS8731	195	92	21.2	9.3	53.7	1.7	1.8	99	303	130
26	GEMS-0220/MBS6717	183	86	21.1	8.8	55.1	0.8	2.7	100	284	120
27	DeKalb 63-57	205	97	20.2	10.2	56.2	2.7	0.8	100	281	131
28	DeKalb 64-69	195	92	21.0	9.4	56.0	0.2	1.5	100	274	122

Table 12. 23NCG01 GEM-Raleigh

Entry	Pedigree	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight (lbs/bu)	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
29	DeKalb 67-44	234	110	21.0	11.4	56.1	1.3	3.7	100	286	121
30	Pioneer 1197R	186	87	17.9	10.3	55.9	2.2	1.2	100	268	105
31	Pioneer 1464 VYHR	217	102	20.4	10.7	55.9	4.0	1.7	100	293	134
32	Pioneer 1637R	211	99	21.4	9.9	55.4	2.9	1.3	99	315	134
33	Wyffels 7870	216	102	21.3	10.3	53.6	-0.1	0.6	100	284	123
34	Pioneer 1185	208	98	20.0	10.5	57.5	2.2	-0.4	98	264	109
35	MBS3919/MBS5507	202	95	20.1	10.1	54.0	7.8	3.8	90	309	151
36	MBS3628/MBS9530	214	101	19.7	11.2	53.4	-0.3	2.6	100	286	127

Experiment Mean	197		20.5	9.7	53.7	2.6	1.9	99	294	131
Check Mean*	213		20.8	10.3	55.9	2.2	1.8	100	290	129
LSD (0.05)	12.5		0.8	0.7	0.8	3.7	2.9	2.1	12.1	6.8
C.V. (%)	8.5		5.3	9.4	2.0	191	212	2.9	5.5	7.0

*Check mean does not include entries 30, 33, 34, 35, or 36. The latter four hybrids were only planted at five locations.

Yield, Moisture, and Y/M were calculated from 11 locations; Test Weight from nine locations; Root and Stalk Lodging and Erect Plants from three locations; Plant and Ear Height from seven locations.

Table 13. 23NCG02 GEM-Raleigh

Entry	Pedigree	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight (lbs/bu)	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
1	(GEMN-0104/GEMN-0048)-010-01//MBS3520	162	83	20.3	8.0	54.4	0.0	0.0	93	279	124
2	(GEMN-0104/GEMN-0048)-010-01//PC2754	172	88	21.8	7.9	56.0	0.0	0.0	93	263	110
3	(GEMN-0135/GEMN-0137)-002-02//MBS3520	176	90	19.7	9.0	55.7	3.5	0.0	94	260	116
4	(GEMN-0135/GEMN-0137)-002-02//PC2754	178	92	21.5	8.1	56.1	2.4	0.5	94	241	101
5	(GEMN-0135/GEMN-0137)-021-04//MBS3520	158	82	19.4	8.2	56.0	0.5	0.0	93	258	103
6	(GEMN-0135/GEMN-0137)-021-04//MBS3640GT	145	75	19.6	7.4	55.7	3.1	0.3	96	274	118
7	(GEMN-0137/GEMN-0135)-003-01//MBS3520	149	77	19.0	8.0	57.1	0.5	0.0	95	265	109
8	(GEMN-0137/GEMN-0135)-003-01//MBS3640GT	127	65	19.9	6.6	56.8	1.3	-0.2	94	270	115
9	(GEMN-0257/GEMN-0048)-010-03//MBS3520	155	80	20.1	7.8	57.1	3.4	0.0	94	235	91
10	(GEMN-0257/GEMN-0048)-010-03//PC2754	170	88	21.9	7.8	56.9	3.3	1.0	90	275	113
11	(GEMN-0272/GEMN-0104)-003-02//MBS3520	145	75	19.0	7.7	55.2	0.0	0.0	97	274	106
12	(GEMN-0272/GEMN-0104)-003-02//MBS3640GT	167	86	18.3	9.0	56.1	1.4	0.4	78	-	-
13	(GEMN-0272/GEMN-0104)-003-02//PC2754	164	85	21.3	7.7	56.3	0.0	0.0	93	256	103
14	(GEMN-0272/GEMN-0104)-004-02//MBS3520	171	88	18.9	9.0	54.4	0.0	0.0	100	260	111
15	(GEMN-0272/GEMN-0104)-004-02//PC2754	159	82	20.6	7.8	55.1	1.9	0.0	98	288	125
16	(GEMN-0272/GEMN-0287)-003-01//MBS3520	162	83	18.2	9.1	55.3	-0.2	-0.2	88	268	111
17	(GEMN-0272/GEMN-0287)-003-01//MBS3640GT	155	80	17.8	9.1	56.0	0.8	-0.1	95	270	101
18	(GEMN-0272/GEMN-0287)-003-01//PC2754	163	84	20.5	7.9	57.1	2.0	1.1	94	255	105
19	(GEMN-0272/GEMN-0287)-003-02//MBS3520	134	69	17.5	7.7	55.9	5.4	0.0	89	254	96
20	(GEMN-0272/GEMN-0287)-003-02//MBS3640GT	151	78	17.3	9.0	55.3	1.0	0.5	94	276	103
21	(GEMN-0272/GEMN-0287)-003-02//PC2754	158	82	20.2	7.9	56.4	6.7	0.5	87	270	111
22	(GEMN-0272/GEMN-0287)-012-01//MBS3520	153	79	17.7	8.7	54.5	0.0	1.0	93	260	100
23	(GEMN-0272/GEMN-0287)-012-01//MBS3640GT	176	90	19.2	9.0	55.9	0.0	0.5	96	259	105
24	(GEMN-0272/GEMN-0287)-012-01//PC2754	160	82	20.4	7.9	54.6	0.5	2.1	91	253	104
25	(GEMN-0287/GEMN-0272)-023-02//MBS3520	155	80	18.0	8.7	55.3	0.0	0.0	97	246	104
26	(GEMN-0287/GEMN-0272)-023-02//MBS3640GT	162	84	18.3	9.0	55.5	1.0	0.0	96	256	101
27	(GEMN-0287/GEMN-0272)-023-02//PC2754	154	79	20.9	7.4	55.9	1.5	1.5	94	268	113
28	(GEMN-0287/GEMN-0272)-025-04//MBS3520	148	76	18.6	8.0	54.5	1.9	1.5	94	255	113
29	(GEMN-0287/GEMN-0272)-025-04//MBS3640GT	178	92	18.7	9.6	54.4	1.1	0.0	92	281	109
30	(GEMN-0287/GEMN-0272)-025-04//PC2754	162	83	21.4	7.7	55.0	0.9	0.0	93	273	114
31	(GEMN-0287/GEMN-0272)-029-01//MBS3520	150	77	17.3	8.6	53.1	0.5	0.0	93	276	123
32	(GEMN-0287/GEMN-0272)-029-01//MBS3640GT	185	96	19.3	9.6	55.2	0.5	0.5	96	264	104
33	(GEMN-0287/GEMN-0272)-029-01//PC2754	164	84	20.9	8.0	53.4	2.7	0.4	94	253	109
34	(GEMN-0287/GEMN-0272)-029-03//MBS3520	149	77	19.0	7.9	53.4	0.0	0.0	97	231	86

Table 13. 23NCG02 GEM-Raleigh

Entry	Pedigree	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight (lbs/bu)	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
35	(GEMN-0287/GEMN-0272)-029-03//MBS3640GT	146	75	18.9	7.7	54.2	0.0	0.0	95	248	95
36	(GEMN-0287/GEMN-0272)-029-03//PC2754	155	80	21.1	7.4	53.6	0.5	0.0	96	228	106
37	(GEMN-0287/GEMN-0272)-029-04//MBS3520	130	67	18.6	7.2	54.0	2.6	0.6	94	256	95
38	(GEMN-0287/GEMN-0272)-029-04//PC2754	156	80	20.3	7.8	54.3	2.6	-0.1	95	258	109
39	CML449:N(GEMN-0097)40x-B04-02/MBS3520	166	86	19.1	8.8	54.7	3.3	4.1	81	253	104
40	CML449:N(GEMN-0097)40x-B04-02/PC2754	175	90	22.1	8.0	53.1	3.6	0.0	87	270	114
41	CML449:N(GEMN-0097)40x-B17-01/MBS3520	153	79	20.1	7.8	53.8	1.4	0.5	95	254	99
42	CML449:N(GEMN-0097)40x-B17-01/PC2754	165	85	22.5	7.4	54.5	1.8	0.0	93	261	109
43	DeKalb 67-44	200	103	19.6	10.1	58.0	0.0	0.0	90	268	105
44	DeKalb 68-69	200	103	21.0	9.5	57.0	0.0	0.0	97	245	101
45	Pioneer 1197R	171	88	15.8	10.6	58.3	2.5	0.0	95	236	93
46	Pioneer 1464 VYHR	188	97	18.2	10.2	58.4	0.0	0.0	97	269	121
47	Pioneer 1794VYHR	182	94	19.0	9.6	57.7	1.0	0.5	92	274	119
48	Pioneer 1847VYHR	187	97	19.5	9.5	58.1	0.0	0.0	97	248	100

Experiment Mean	164	84	19.7	8.4	55.5	1.4	0.4	93.8	261	107
Check Mean*	194	100	19.8	9.8	57.7	0.2	0.1	94.4	254	107
LSD (0.05)	17	9	0.9	0.8	0.9	2.1	1.2	5.4	14.8	11.6
C.V. (%)	13	7	6.1	12.7	2.0	195	417	7.4	7.3	14.0

*Check mean does not include entry 45.

Yield, Moisture, Y/M calculated from 11 environments, Test Weight from 8 environments, Root and Stalk Lodging from five environments, Erect Plants from six environments, and Plant and Ear Height from four environments.

Table 14. 23NCG04 GEM-Raleigh

Entry	Pedigree	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
1	(GEMS-0227/42T1)-B05-01//MBS6717	154	85	16.1	9.7	56.7	0.0	0.0	100	272	107
2	(GEMS-0227/42T1)-B05-01//MBS8731	160	88	16.3	9.7	54.6	0.3	0.0	100	275	112
3	(GEMS-0227/42T1)-B05-02//MBS6717	167	92	15.9	10.6	55.7	0.3	0.0	100	277	114
4	(GEMS-0227/42T1)-B05-02//MBS8731	169	93	16.1	10.6	55.7	0.3	0.0	100	283	116
5	(GEMS-0227/42T1)-B16-03//MBS6717	148	81	16.7	8.8	55.4	0.0	0.0	100	269	107
6	(GEMS-0227/42T1)-B16-03//MBS8731	160	88	16.9	9.5	55.0	0.3	0.0	100	281	123
7	(GEMS-0227/42T1)-B25-02//MBS6717	161	89	16.8	9.7	55.5	0.3	0.0	100	280	114
8	(GEMS-0227/42T1)-B25-02//MBS8731	159	87	16.9	9.4	54.3	0.0	0.3	100	292	123
9	(GEMS-0227/42T1)-B27-04//MBS6717	166	91	16.7	10.2	54.6	0.3	2.0	98	287	126
10	(GEMS-0227/42T1)-B27-04//MBS8731	154	84	17.0	9.1	54.3	0.0	0.0	100	309	130
11	(GEMS-0227/42T1)-B34-01//MBS6717	154	85	16.3	9.5	55.3	0.9	0.9	98	284	117
12	(GEMS-0227/42T1)-B34-01//MBS8731	165	91	16.2	10.1	54.0	0.0	0.0	100	292	121
13	(GEMS-0227/42T1)-B34-02//MBS6717	134	74	16.7	8.1	56.2	0.5	0.8	99	278	118
14	(GEMS-0227/42T1)-B34-02//MBS8731	148	81	16.6	9.0	54.8	1.1	1.4	97	302	130
15	(GEMS-0227/42T1)-B35-02//MBS6717	151	83	15.9	9.6	56.4	0.3	0.3	99	283	112
16	(GEMS-0227/42T1)-B35-02//MBS8731	162	89	15.7	10.3	54.6	0.3	0.0	100	291	118
17	(GEMS-0227/42T2)-B03-01//MBS6717	156	86	16.1	9.8	56.8	0.6	0.0	99	270	110
18	(GEMS-0227/42T2)-B03-01//MBS8731	170	93	16.3	10.3	55.0	0.2	0.8	99	289	122
19	(GEMS-0227/42T2)-B09-01//MBS6717	147	81	15.7	9.4	57.5	1.1	0.0	99	268	103
20	(GEMS-0227/42T2)-B09-01//MBS8731	169	93	16.3	10.4	54.6	0.0	0.0	100	286	118
21	(GEMS-0227/42T2)-B11-01//MBS6717	157	87	16.1	9.8	57.4	0.0	0.0	100	272	112
22	(GEMS-0227/42T2)-B11-01//MBS8731	162	89	16.9	9.5	54.9	0.0	0.0	100	278	115
23	(GEMS-0227/42T2)-B14-01//MBS6717	151	83	17.2	8.9	54.7	0.0	0.2	100	259	106
24	(GEMS-0227/42T2)-B14-01//MBS8731	168	92	17.2	9.8	53.9	1.4	0.3	98	283	122
25	(GEMS-0227/42T2)-B18-01//MBS6717	163	89	18.0	9.0	56.3	0.6	0.0	99	276	118
26	(GEMS-0227/42T2)-B18-01//MBS8731	171	94	17.8	9.7	54.3	0.0	0.0	100	289	126
27	(GEMS-0227/42T2)-B29-01//MBS6717	147	81	15.8	9.4	56.8	0.5	0.0	99	274	108
28	(GEMS-0227/42T2)-B29-01//MBS8731	171	94	16.6	10.3	53.7	0.0	0.0	100	282	113
29	(GEMS-0227/42T2)-B30-01//MBS6717	160	88	16.8	9.7	56.2	0.6	0.0	99	283	119
30	(GEMS-0227/42T2)-B30-01//MBS8731	167	92	16.8	10.0	52.9	1.4	1.1	97	287	131
31	(GEMS-0227/42T2)-B31-01//MBS6717	143	79	17.6	8.1	55.8	0.6	0.0	99	262	108
32	(GEMS-0227/42T2)-B31-01//MBS8731	159	87	16.9	9.4	53.2	1.4	0.6	98	279	117
33	(GEMS-0227/42T2)-B44-01//MBS6717	165	91	16.9	9.9	56.0	0.6	0.0	99	282	114
34	(GEMS-0227/42T2)-B44-01//MBS8731	173	95	17.6	9.8	54.2	0.0	0.7	99	287	130

Table 14. 23NCG04 GEM-Raleigh

Entry	Pedigree	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
35	(GEMS-0227/42T2)-B50-03//MBS6717	163	90	16.8	9.8	55.9	0.4	0.0	100	278	112
36	(GEMS-0227/42T2)-B50-03//MBS8731	166	91	16.9	9.9	53.9	0.0	0.5	99	292	123
37	(GEMS-0227/42T2)-B54-01//MBS6717	148	81	16.5	9.0	57.0	0.0	0.0	100	261	106
38	(GEMS-0227/42T2)-B54-01//MBS8731	161	89	16.5	9.7	54.3	0.3	0.0	100	284	112
39	(GEMS-0227/42T2)-B62-01//MBS6717	148	81	16.1	9.3	57.8	0.0	0.0	100	257	105
40	(GEMS-0227/42T2)-B62-01//MBS8731	156	86	16.6	9.3	56.1	0.0	0.0	100	277	114
41	(GEMS-0227/42T2)-B75-03//MBS6717	149	82	16.6	9.1	55.7	0.3	0.6	99	284	117
42	(GEMS-0227/42T2)-B75-03//MBS8731	174	96	16.3	10.7	54.0	0.3	0.0	100	285	119
43	DeKalb 63-57	185	102	16.3	11.4	57.7	0.0	0.0	100	269	127
44	DeKalb 64-69	171	94	16.9	10.2	56.9	0.0	0.0	100	262	114
45	DeKalb 67-44	194	107	17.0	11.5	57.1	0.0	0.6	99	276	121
46	Pioneer 1197R	154	85	15.1	10.1	56.5	0.0	0.0	100	256	106
47	Pioneer 1464 VYHR	179	98	16.4	11.0	56.9	0.4	0.6	99	271	117
48	Pioneer 1637R	181	99	17.0	10.6	56.6	0.5	0.0	99	293	122

Experiment Mean	161		16.6	10.0	55.5	0.5	0.5	99	279	116
Check Mean*	182		16.7	11.0	57.0	0.6	1.0	100	274	120
LSD (0.05)	12.7		0.7	0.9	0.9	1.0	1.6	1.3	10.4	8.2
C.V. (%)	10.6		5.8	11.6	2.1	273	414	1.8	5.0	9.4

*Check mean does not include entry 46.

Yield, Moisture, Y/M calculated from 13 environments, Test Weight from eight environments, Root and Stalk Lodging, Erect Plants and Plant and Ear Height from nine environments.

Table 15. 23NCG13 GEM-Raleigh

Entry	Pedigree	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
1	GEMN-0048/MBS2887	159	87	16.5	9.7	55.2	1.1	8.1	91	303	132
2	GEMN-0048/MBS3520	156	85	16.8	9.5	54.4	0.3	0.4	99	292	115
3	GEMN-0048/PC2754	158	86	18.0	9.0	56.8	3.2	1.1	96	291	124
4	GEMN-0097/MBS2887	152	83	15.0	10.2	55.1	2.6	1.8	96	291	130
5	GEMN-0097/MBS3520	130	71	14.8	8.8	55.5	3.5	0.0	97	298	118
6	GEMN-0097/PC2754	162	89	17.1	9.5	56.8	3.1	2.9	94	294	133
7	GEMN-0104/MBS3520	162	89	17.9	9.2	54.1	0.2	0.6	99	307	140
8	GEMN-0104/PC2754	171	94	20.0	8.8	55.0	2.5	0.5	97	306	146
9	GEMN-0108/MBS3520	152	83	18.4	8.2	54.8	0.9	0.4	99	301	127
10	GEMN-0124/MBS2887	165	90	18.2	9.1	54.7	4.2	4.5	91	283	134
11	GEMN-0124/MBS3520	168	92	17.6	9.8	54.8	1.7	1.1	97	285	126
12	GEMN-0124/MBS3640GT	171	94	18.4	9.5	54.2	2.4	1.6	96	296	136
13	GEMN-0124/PC2754	164	90	19.3	8.6	55.6	9.2	1.2	90	284	135
14	GEMN-0135/MBS3520	152	83	17.4	9.0	56.0	2.7	4.9	92	308	147
15	GEMN-0137/MBS3520	157	86	18.2	8.7	55.7	1.4	0.0	99	292	136
16	GEMN-0137/PC2754	169	93	19.2	8.8	55.7	1.4	1.2	97	284	137
17	GEMN-0177/MBS3520	156	85	16.4	9.7	56.5	2.3	1.8	96	302	131
18	GEMN-0178/MBS3520	155	85	16.7	9.5	55.2	0.7	0.5	99	300	124
19	GEMN-0225/MBS3520	149	82	16.8	9.0	55.5	1.6	1.8	97	293	134
20	GEMN-0230/MBS3520	162	89	17.1	9.8	56.6	0.4	0.5	99	307	143
21	GEMN-0230/PC2754	167	91	18.1	9.6	57.4	5.6	3.9	91	293	140
22	GEMS-0232/MBS2887	167	91	17.2	9.7	55.1	1.1	0.4	99	304	156
23	GEMS-0232/MBS3520	158	86	16.5	9.7	55.8	1.1	0.0	99	289	141
24	GEMS-0232/PC2754	180	98	19.1	9.6	55.9	5.9	1.7	92	297	148
25	GEMN-0238/MBS3520	155	85	15.7	10.0	54.8	1.6	2.7	96	293	127
26	GEMN-0242/MBS3520	162	88	17.3	9.5	56.7	4.0	5.5	91	308	144
27	GEMN-0242/PC2754	163	89	18.9	8.7	57.5	5.1	2.0	93	301	136
28	GEMN-0254/MBS3520	150	82	16.5	9.2	56.7	2.0	0.4	98	295	116
29	GEMN-0254/MBS2887	157	86	17.1	9.3	57.1	4.0	4.2	92	298	138
30	GEMN-0254/PC2754	173	94	18.3	9.6	58.1	2.0	1.8	96	287	124
31	GEMN-0257/MBS3520	153	84	17.5	9.0	55.8	3.4	4.0	93	298	132
32	GEMN-0257/PC2754	158	87	19.9	8.0	55.7	6.6	4.5	89	291	139
33	GEMN-0259/MBS2887	143	78	16.5	8.8	57.2	8.9	6.5	85	317	151
34	GEMN-0259/PC2754	164	90	17.8	9.4	57.9	3.5	5.2	91	315	146
35	GEMN-0259/MBS3520	160	88	16.2	10.0	57.2	0.7	4.7	95	316	143
36	GEMN-0270/MBS3520	139	76	17.6	7.8	54.2	1.2	2.5	96	303	126
37	GEMN-0270/PC2754	155	85	19.8	7.8	54.4	3.1	1.4	96	292	138
38	GEMN-0271/MBS2887	169	93	17.6	9.9	56.5	2.9	7.1	90	322	158

Table 15. 23NCG13 GEM-Raleigh

Entry	Pedigree	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
39	GEMN-0271/MBS3520	148	81	16.5	8.9	57.4	0.9	1.6	97	305	132
40	GEMN-0271/PC2754	168	92	18.4	9.3	57.8	5.0	1.9	93	304	146
41	GEMN-0272/MBS2887	154	84	16.6	9.3	54.6	5.2	3.1	92	297	140
42	GEMN-0272/MBS3520	158	87	16.2	9.8	54.6	0.2	0.4	99	294	122
43	Pioneer 2042VYHR	175	96	18.6	9.5	57.3	0.0	0.4	100	292	122
44	GEMN-0272/PC2754	159	87	17.9	9.0	55.1	3.1	0.2	97	292	127
45	GEMN-0287/MBS2887	160	88	17.5	9.3	55.7	1.1	2.4	96	316	147
46	GEMN-0287/MBS3520	145	79	16.4	9.0	55.1	1.0	0.2	99	304	130
47	GEMN-0287/PC2754	160	88	19.4	8.4	55.6	0.9	0.7	98	292	127
48	Pioneer 1622VYHR	177	97	17.5	10.2	57.0	0.9	0.0	99	269	115
49	GEMN-0292/PC2754	158	86	18.1	9.0	55.6	3.3	2.3	94	294	132
50	GEMN-0302/PC2754	148	81	18.0	8.3	56.8	0.2	0.4	99	271	118
51	GEMN-0309/PC2754	153	84	16.8	9.5	57.4	1.2	5.1	94	277	128
52	GEMN-0310/MBS2887	158	87	16.0	9.9	54.7	1.9	1.9	96	299	139
53	GEMN-0310/MBS3520	152	83	15.7	9.8	55.3	2.3	2.2	96	294	127
54	GEMN-0310/PC2754	174	95	17.9	9.9	56.7	5.3	2.6	92	293	137
55	GEMN-0319/MBS3520	144	79	16.2	8.8	54.7	0.5	1.8	98	283	124
56	GEMN-0319/MBS3640GT	148	81	17.1	8.6	54.8	0.2	0.0	100	282	124
57	GEMN-0319/PC2754	156	85	18.5	8.6	56.6	0.7	0.6	99	293	131
58	GEMN-0325/PC2754	161	88	18.9	8.7	56.7	2.3	1.4	96	282	127
59	DeKalb 64-69	156	85	16.8	9.2	56.7	0.7	0.4	99	268	114
60	DeKalb 67-44	189	104	17.3	11.1	56.7	0.2	0.4	99	282	121
61	Pioneer 1197R	157	86	15.3	10.2	56.9	0.0	0.0	100	257	109
62	Pioneer 1464 VYHR	185	101	17.2	11.2	57.5	0.0	0.0	100	278	134
63	Pioneer 1847VYHR	181	99	18.1	10.0	57.5	0.0	0.0	100	287	119
64	Pioneer 1903YHR	190	104	18.2	10.6	55.7	0.0	0.4	100	287	131

Experiment Mean	161		17.5	9.3	56.0	2.3	1.9	96	294	132
Check Mean*	183		17.8	10.4	56.9	0.2	0.2	100	283	124
LSD (0.05)	16.6		1.0	1.0	1.1	3.3	3.6	5.2	11.0	8.8
C.V. (%)	12.9		6.9	13.9	2.5	180	235	6.7	4.7	8.2

*Check mean does not include entry 61.

Yield, Moisture, Y/M calculated from 12 environments, Test Weight, Root and Stalk Lodging, and Erect
Plants from eight environments, and Plant and Ear Height from nine environments.

Table 16. 23NCG14 GEM-Raleigh

Entry	Pedigree	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
1	GEMS-0050/MBS8731	155	90.0	16.4	9.5	54.9	2.5	1.6	96	272	118
2	GEMS-0050/MBS6717	152	88.8	16.2	9.5	55.1	0.3	0.0	100	275	123
3	GEMS-0115/MBS8731	168	98.2	16.1	10.4	55.4	3.2	0.0	97	283	127
4	GEMS-0115/MBS6717	160	93.2	16.4	9.8	55.9	0.3	0.0	100	275	119
5	GEMS-0147/MBS8731	168	97.6	16.6	10.2	54.9	1.9	0.6	97	282	122
6	GEMS-0220/MBS8731	168	97.7	16.0	10.6	55.8	1.5	0.3	98	283	120
7	GEMS-0220/MBS6717	150	87.2	15.7	9.8	57.3	0.0	0.0	100	265	110
8	GEMS-0226/MBS8731	158	91.8	16.4	9.7	56.9	1.6	0.5	98	271	122
9	GEMS-0227/MBS8731	141	82.0	15.7	8.9	55.5	0.8	0.0	99	260	98
10	GEMS-0243/MBS6717	165	96.1	17.4	9.8	56.2	0.7	0.2	99	299	129
11	GEMS-0244/MBS6717	151	87.9	16.9	9.2	55.2	1.9	1.2	97	292	133
12	GEMS-0245/MBS8731	149	86.9	16.9	9.0	56.0	3.3	0.5	96	293	134
13	GEMS-0245/MBS6717	148	86.1	17.0	8.9	58.5	0.3	0.4	99	282	121
14	GEMS-0255/MBS6717	139	80.8	16.7	8.5	57.2	2.4	0.6	97	278	119
15	GEMS-0256/MBS6717	145	84.8	16.4	9.2	57.4	3.3	1.6	95	277	118
16	GEMS-0258/MBS6717	167	97.3	17.0	9.9	54.8	2.5	0.2	97	283	132
17	GEMS-0273/MBS6717	154	89.6	16.8	9.6	56.5	3.7	1.4	95	279	120
18	GEMS-0274/MBS6717	154	89.7	16.3	9.8	56.4	1.9	4.2	94	279	116
19	GEMS-0281/MBS8731	155	90.4	16.1	9.7	55.2	1.2	0.2	99	265	112
20	GEMS-0281/MBS6717	159	92.6	16.2	10.1	57.7	0.8	1.0	98	263	108
21	GEMS-0293/MBS8731	159	92.8	16.9	9.6	54.4	1.8	0.0	98	277	128
22	GEMS-0293/MBS6717	151	87.9	16.4	9.4	55.4	0.9	0.8	98	265	115
23	GEMS-0298/MBS8731	159	92.4	15.9	10.0	55.8	0.5	0.0	99	264	111
24	GEMS-0298/MBS6717	156	90.6	16.1	9.9	56.8	1.9	0.3	98	253	90
25	GEMS-0311/MBS8731	159	92.7	17.6	9.3	56.1	1.1	0.2	99	297	136
26	GEMS-0311/MBS6717	160	93.5	17.0	9.6	55.5	1.2	0.9	98	288	129
27	GEMS-0312/MBS8731	153	89.4	16.3	9.4	54.2	7.4	1.4	91	291	138
28	GEMS-0314/MBS8731	156	90.8	16.4	9.5	55.3	3.0	1.3	96	277	118
29	GEMS-0314/MBS6717	146	85.3	15.4	9.6	57.1	4.5	0.0	96	259	99
30	GEMS-0320/MBS8731	166	96.8	16.1	10.2	54.1	4.0	0.0	96	291	133
31	GEMS-0320/MBS6717	157	91.4	16.3	9.8	55.2	0.8	0.0	99	269	121
32	GEMS-0321/MBS8731	171	99.6	16.6	10.3	55.9	1.8	0.9	97	291	133
33	GEMS-0321/MBS6717	156	91.0	16.0	9.8	55.8	2.7	0.3	97	282	126
34	GEMS-0322/MBS8731	150	87.7	15.7	9.6	55.2	2.7	1.9	95	262	114
35	GEMS-0322/MBS6717	142	82.9	15.4	9.4	57.6	2.3	0.5	97	241	99
36	GEMS-0323/MBS8731	149	87.0	15.3	9.8	53.8	0.8	0.2	99	262	111
37	GEMS-0323/MBS6717	149	86.6	14.9	10.0	57.2	0.5	0.2	99	253	104
38	GEMS-0324/MBS8731	161	93.9	15.6	10.3	56.2	1.6	0.2	98	275	113
39	GEMS-0324/MBS6717	147	85.7	15.5	9.6	57.7	1.3	0.0	99	261	101
40	DeKalb 64-69	147	85.8	16.6	8.9	57.6	1.3	0.0	99	251	106

Table 16. 23NCG14 GEM-Raleigh

Entry	Pedigree	Yield (bu/ac)	% Check Mean	Moisture (%)	Y/M	Test Weight	Stalk Lodging (%)	Root Lodging (%)	Erect Plants (%)	Plant Height (cm)	Ear Height (cm)
41	DeKalb 67-44	184	107.4	16.6	11.1	58.2	0.0	0.0	100	267	114
42	Pioneer 1197R	160	93.4	15.3	10.6	57.7	0.0	0.0	100	249	99
43	Pioneer 1464 VYHR	174	101.5	15.9	11.0	57.3	1.2	0.2	99	274	128
44	Pioneer 1847VYHR	168	98.2	17.3	9.8	57.1	0.3	0.0	100	270	110
45	Pioneer 1289YHR	175	101.8	16.0	11.1	58.6	0.8	0.0	99	278	112
46	Pioneer 1587Q	165	96.2	16.2	10.3	57.9	0.5	0.0	99	271	117
47	Pioneer 1622VYHR	166	96.6	16.5	10.1	57.9	5.6	0.2	94	259	107
48	Pioneer 1903YHR	167	97.6	17.4	9.6	58.4	1.1	0.0	99	248	119

Experiment Mean	157		16.3	9.8	56.3	1.8	0.5	98	273	117
Check Mean*	172		16.6	10.4	57.9	1.4	0.1	99	267	115
LSD (0.05)	16.3		0.9	1.1	0.9	3.8	1.5	4.3	11.3	9.2
C.V. (%)	12.9		6.6	13.9	2.0	267	370	5.4	5.2	9.8

*Check mean does not include entry 42.

Yield, Moisture, Y/M calculated from 11 environments, Test Weight from eight environments, Root and Stalk Lodging from five environments, Erect Plants from six environments, and Plant and Ear Height from four environments.

Table 17. 2023 GEM-Ames Coded Line Trials (2364301)

Entry	GEM Line	Tester	%CHK YLD	Yield (bu/ac)	MST	TWT	PLTHT	EARHT
1	GEMS-0313	MBS4409	91.2	222.8	18.9	54.3	281.4	121.0
2	GEMS-0314	MBS4409	88.8	216.8	19.2	52.6	292.2	120.0
3	GEMS-0315	MBS4409	86.6	211.5	18.0	52.8	283.9	123.0
4	GEMS-0316	MBS4409	76.8	187.5	18.4	54.4	263.2	115.0
5	GEMS-0324	MBS4409	96.5	235.6	18.8	52.7	282.1	127.0
6	GEMS-0320	MBS4409	95.0	232.1	19.9	52.2	304.5	147.3
7	GEMS-0321	MBS4409	90.4	220.8	19.2	51.7	309.8	144.0
8	GEMS-0322	MBS4409	83.7	204.3	18.4	52.4	276.0	118.0
9	GEMS-0323	MBS4409	94.5	230.9	17.3	53.1	280.4	121.0
10	GEMS-0313	MBS5507	89.7	219.0	19.5	55.2	284.3	129.0
11	GEMS-0314	MBS5507	95.5	233.3	20.1	53.2	290.0	143.0
12	GEMS-0315	MBS5507	86.1	210.3	18.5	53.0	285.8	141.0
13	GEMS-0316	MBS5507	82.6	201.7	19.2	53.5	273.0	131.0
14	GEMS-0324	MBS5507	93.9	229.2	19.8	52.8	290.4	144.0
15	GEMS-0321	MBS5507	94.4	230.5	20.0	51.7	313.3	169.0
16	GEMS-0322	MBS5507	89.9	219.6	18.8	53.8	287.0	143.0
17	GEMS-0323	MBS5507	89.2	217.7	18.3	53.0	276.4	128.0
18	GEMS-0313	MBS6717	90.4	220.8	20.2	55.0	265.4	108.0
19	GEMS-0324	MBS6717	93.2	227.6	19.8	52.8	277.0	119.0
20	GEMS-0320	MBS6717	99.9	243.9	20.6	50.8	294.3	142.0
21	GEMS-0321	MBS6717	106.9	261.0	20.1	50.4	301.2	144.0
22	GEMS-0313	MBS9451	90.7	221.6	18.6	52.9	285.0	128.0
23	GEMS-0314	MBS9451	92.7	226.5	19.9	50.4	297.2	137.0
24	GEMS-0315	MBS9451	93.2	227.7	18.1	50.7	283.0	127.0
25	GEMS-0316	MBS9451	78.5	191.6	19.1	51.7	268.7	123.0
26	GEMS-0324	MBS9451	96.8	236.5	18.5	51.1	288.2	121.0
27	GEMS-0320	MBS9451	105.2	256.9	21.8	49.8	302.1	145.6
28	GEMS-0321	MBS9451	96.9	236.6	19.9	50.5	307.1	142.0
29	GEMS-0322	MBS9451	87.5	213.8	18.8	52.0	271.1	121.9
30	GEMS-0323	MBS9451	89.0	217.3	17.6	51.8	276.9	119.0
31	GEMS-0313	PC6567	81.1	198.0	19.7	53.9	277.1	118.0
32	GEMS-0314	PC6567	96.5	235.6	21.6	51.6	295.9	146.0
33	GEMS-0316	PC6567	86.3	210.7	19.7	52.9	268.7	133.0
34	GEMS-0324	PC6567	101.1	246.9	19.7	52.6	285.2	129.0
35	GEMS-0320	PC6567	96.5	235.7	21.7	51.0	307.9	159.1
36	GEMS-0321	PC6567	93.4	228.1	20.7	51.7	308.7	157.0
37	GEMS-0322	PC6567	86.8	212.1	19.4	52.8	292.4	138.0
38	GEMS-0323	PC6567	88.1	215.1	17.5	52.2	281.0	129.0

Number of Locations			13	13	13	13	13
Non Check Mean			223.3	19.3	52.4	287.1	132.9
Check Mean			244.2	19	52.7	268.4	121.3
H ²			0.86	0.92	0.95	0.89	0.95

Table 18. 2023 GEM-Ames Coded Line Trials (2364302)

Entry	GEM Line	Tester	%CHK YLD	Yield (bu/ac)	MST	TWT	PLTHT	EARHT
1	GEMN-0317	MBS2691	98.2	238.2	20.1	52.2	303.9	142.0
2	GEMN-0317	MBS2887	90.9	220.6	19.7	52.8	290.4	140.0
3	GEMN-0317	PC1476	81.1	196.9	19.7	52.0	301.5	139.0
4	GEMN-0317	PC3565	89.7	217.6	18.9	53.1	295.4	131.0
5	GEMN-0318	MBS2691	92.1	223.5	22.0	51.1	297.1	134.0
6	GEMN-0318	MBS2887	97.4	236.4	19.4	52.3	299.5	138.0
7	GEMN-0318	PC1476	84.5	205.0	19.1	52.2	297.8	134.0
8	GEMN-0319	MBS2691	93.7	227.3	21.8	51.2	281.3	124.0
9	GEMN-0319	MBS2887	97.2	235.9	20.5	51.8	295.8	137.0
10	GEMN-0319	PC1476	90.8	220.4	19.6	51.4	292.1	130.0
11	GEMN-0319	PC2754	93.4	226.6	22.7	51.8	290.9	126.0
12	GEMN-0319	PC3565	84.6	205.2	19.2	53.0	279.1	120.0
13	GEMN-0325	MBS2691	91.5	222.0	21.6	51.5	286.6	131.0
14	GEMN-0325	MBS2887	92.5	224.5	21.4	51.0	294.7	135.0
15	GEMN-0325	PC1476	93.3	226.4	18.3	52.7	297.8	138.0
16	GEMN-0325	PC2754	104.4	253.2	22.0	52.0	294.8	131.0
17	GEMN-0325	PC3565	91.4	221.7	20.0	52.7	276.9	119.0

Number of Locations			13.0	13.0	13.0	13.0	13.0
Non Check Mean			223.6	20.3	52.0	292.7	132.3
Check Mean			242.6	18.6	52.5	277.6	120.7
H ²			0.86	0.96	0.92	0.94	0.91

Table 19. 2023 GEM-Ames Yield Trial Summary

Experiment	Material	Tester	Entries	Locations	Plots	Usable Reps	H ² Yield
2313101	HBA1/CML323//GEMN-0097	PC3565; MBS3640GT	36	6	216	6	0.85
2313102	LH213/Ki59//LH283	PC3565	36	6	216	5	0.8
2313103	LH168/CML323//LH283; PHW86/KS23-6//LH283	PC3565	36	6	216	6	0.91
2313104	PHHB9/Ki59//LH244	PC6567	48	6	288	5	0.72
2313105	PHG39/KS23-6//GEMS-0147; LH204/KS23-6//WQCD10	PC6567; MBS8814	84	6	504	6	0.54
2313106	LH195/CML373//HC33; PHG39/CML373//WQCD10; PHW51/CML373//PHTP9	PC6567	96	6	576	6	0.75
2313107	PHHB9/KS23-6//GEMS-0227	PC6567	96	6	576	5	0.54
2313108	3IIH6/CML311//GEMN-0097; 3IIH6/CML323//GEMN-0302; LH82/CML323//LH216; PHW86/KS23-6//PHJ33	PC3565	72	6	432	6	0.86
2313109	PHHB4/55T4//LH244; PHK29/55T3//PHTP9	PC6567; MBS8814	96	6	576	5	0.55
2313110	GEMS-0227/CML373//FBLL	PC6567	60	6	360	6	0.69
2313111	PHK29/KS23-5//WQCD10; HC33/Ki30//PH42B;	PC6567; MBS8488	84	6	504	6	0.67
2374101	GEM Pop Dev1	MBS8488	36	6	216	6	0.91
2364201	2FACC//KS23-6/LH204; KS23-6/LH195//PHHB4; LH204//KS23-6/PHW52; LH204//La Posta Seq C7/PHP38; PHHB4/KS23-6//2FACC; PHHB4/KS23-6//2FACC; PHHB9//KS23-6/PHW52; PHHB9//KS23-6/PHW52; PHW52//KS23-6/PHP38	MBS8488	96	11	1056	11	0.86
2364202	2FACC//KS23-6/LH204; KS23-6/LH195//PHHB4; LH204//KS23-6/PHW52; LH204//La Posta Seq C7/PHP38; PHHB4/KS23-6//2FACC; PHHB4/KS23-6//2FACC; PHHB9//KS23-6/PHW52; PHHB9//KS23-6/PHW52; PHW52//KS23-6/PHP39	MBS8731	96	10	960	9	0.61
2364203	2FACC//KO679Y/La Posta Seq C7; La Posta Seq C7/40a//R3212Z	MBS8488	48	14	672	14	0.92
2364204	2FACC//KO679Y/La Posta Seq C7; La Posta Seq C7/40a//R3212Z	MBS8731	48	10	480	9	0.74
2364205	LH213/AC454//3IIH6; CML449/LH82//LH168; LH82/89343//PHR03; PHN37/CA00370//LH82; FL 4BT7/LH185//LH168; PHN37/CML449//MM501D	MBX20601; MBS3640GT	60	10	600	10	0.88
2364206	LH213/AC454//3IIH6; CML449/LH82//LH168; LH82/89343//PHR03; PHN37/CA00370//LH82; FL 4BT7/LH185//LH168; PHN37/CML449//MM501D	MBX20601; PC3565	60	14	840	13	0.91
2364301	GEM Stiff Stalk Coded Line Trial	Misc.	48	13	624	12	0.86
2364302	GEM Non-stiff Stalk Coded Line Trial	Misc.	24	13	312	11	0.86

