

Cotton Germplasm Committee Meeting Minutes

Wednesday January 3, 2024. 2:00 – 3:00 pm CST

Omni Hotel Fort Worth, Fort Worth Ballroom 6-8

Members in attendance: Todd Campbell, Jim Olvey, Josh Udall, Cory Mills, Jodi Scheffler, Don Jones, Kolbyn Joy, Lori Hinze, Tom Brooks

The current chair, Peng Chee was unable to attend due to a family emergency and Todd Campbell chaired the meeting in Peng Chee's absence.

Todd Campbell informed the committee that Steve Hague had requested resign from the committee.

The committee was also informed that the National Program Leader (NPL) Peter Bretting had retired, but is still active.

Roll was taken and after a short discussion, it was determined that we had a quorum.

Introductions were made including the two new committee members, Duke Pauli and Lori Hinze.

The minutes from the 2023 CCGC meeting were reviewed.

It was noted that Lori Hinze's appointment to the committee was not included.

It was proposed to add:

Lori Hinze nominated as a new committee member by Jodi Scheffler

Todd Campbell seconded and the nomination was passed by vote of the committee.

Motion to accept minutes as amended (K Joy) Second (D Jones). Passed by general consent.

Committee Membership

Currently we have 4 university members, 4 private industry members and 5 ARS members.

Need to elect a new member to replace Steve Hague and someone to replace Steve as the vice chair Steve Hague.

Don Jones nominated Jodi Scheffler for the vice chair position, seconded by Tom Brooks.

Motion to close nominations (C Mills) and seconded (D Jones) motion carried.

Don Jones nominated Jenny Koebernick as the new committee member, seconded (J Olvey).

There were no other nominations. J Scheffler moved to close nominations and seconded (K Joy). J Koebernick elected by general consent.

Winter Nursery Report and Discussion

Report (Don Jones)

This year planting was delayed 4 weeks due to prolonged rain and flooding. The first planting was 4 weeks late and at the same time as the second planting. The third planting was December 11th.

Land rent increased significantly and forced the winter nursery manager to move most of the

planting to a new field adjacent to the previous site. A new well was also installed. Don Jones provided some history on the budgeting transition that occurred two years ago and commented that it was working well.

Josh Udall presented the Winter Nursery Report in James Frelichowski's absence. Universities were the most active users of the NCGC with 13 users from those institutions requesting seed. The other major users were USDA-ARS and US commercial companies. The number of requests declined again but the number of accessions requested per order rose. Probably due to individual users building up their cotton breeding base with many and diverse accessions.

Funding for seed increases has remained flat while costs have increased significantly. Greater commitment to accession increases is needed to keep the seed of all sub-collections viable while meeting the increasing demand from users and the additional seed required for long term storage at Fort Collins, CO. A better balance is needed to sustain seed increase activities of the more easily curated sub-collection and accessions along with intensive care of the critical ones.

The number of accessions sent to the winter nursery (173) held steady.

Jim Olvey asked how much of the CGC material we are losing yearly. J Udall said that they were currently conducting germination tests on the collection accessions and prioritizing those with poor germination for expedited rejuvenation.

CottonGen database is maintained by Jing Yu and no problems reported, but there was some concern about future funding.

National Plant Germplasm Report

Todd Campbell presented the report from Peter Bretting and highlighted that there were significant changes with six germplasm collection curators leaving or retiring.

The 2018 Farm Bill mandated a report on the status of the National Plant Germplasm System (NPGS). The report was led by Peter Bretting and has just been released. This report was the basis for the NPGS Plan that will be included in the future government budget.

T Campbell encouraged the committee members to read the report and plan and see where cotton could fit.

Other Business

Lori Hinze added some information about the NPGS plan stating that there were requests for permanent funds to support personnel and one time funding for genotyping the collections.

There was no other new business and D Jones made a motion to adjourn, seconded (J Udall) and motion carried.

Meeting adjourned at 3:00 PM.

Cotton Crop Germplasm Committee Meeting January 14, 2025

U.S. National Cotton Germplasm Collection (NCGC) report for the calendar year 2022.
USDA-ARS-PA-SPARC, Crop Germplasm Research Unit (CGRU), College Station, TX.

CGRU Research Leader: Joshua Udall

NCGC Curator: James Frelichowski

NCGC Technician: Janna Love (**retired**) job advertisement <https://www.usajobs.gov/job/826932200>

Cotton Winter Nursery (CWN): Alfonso Palafox

CGRU scientists: Lori Hinze, John Yu

NCGC Contents, update

Contents of the NCGC were reviewed for acquisitions since 2006 because many were finally admitted to the NCGC after testing for Adventitious Presence (AP) of transgenes in *G. hirsutum* and *G. barbadense* released from JPR or PVPO protection, and seed increases/assignment of PI numbers of collected/donated germplasm.

Table 1. Summaries of the NCGC contents, acquisitions, requests since 2006 (& 2024) by sub-collection.

Sub-collection	NCGC accessions	Acquired since 2006	Pending acquisitions	Requests since 2006	Average yearly request	2024 requests
A ₁ /A ₂ diploid cotton	1923	0	0	5458	287	283
<i>G. barbadense</i>	1618	32	0	6762	356	170
<i>G. hirsutum</i> improved	3679	532	140	25668	1351	2381
<i>G. hirsutum</i> 'wild'	2241	125	20	11780	620	440
Tetraploid species	203	9	0	408	22	42
Diploid species	447	93	0	2201	116	86
Totals	9664	791	160	52277	2751	3403

Seed increase, characterization

Totals for three environments used for 2024 seed increase and characterization are shown in Table 2: CWN in Costa Rica, College Station (CS) field and USDA Greenhouses (GH). The CWN 2025 season has been planted and totals 1425 hills. Eleven other users sent seed for 5311 hills. The grand total for 2024 of the NCGC is 820 accessions. Nine years of CWN plantings are shown in Table 3 and graphically illustrated in Figure 1. CS plantings have been used for day neutral flowering critical accessions of the NCGC, even occasionally planting exotic *Gossypium* species. GH plantings are the last resort for the most critical accessions or indefinitely house the most exotic and difficult to grow species and accessions. Since 2006, 1343 accessions of 40 species have been cultivated in USDA greenhouses. Currently, the greenhouses contain 34 species of *Gossypium*, 948 accessions in pots. GH plants are high maintenance, require daily self-pollination, weekly seed harvesting, regular fertilization, spraying for pests and even use of growth regulators to keep plants of reasonable size. An ideal situation would be the commitment of all TEX, GB, and SA sub-collections to the CWN, leaving only the exotic species and diploid cotton species for high maintenance cultivation in the CS fields and greenhouses, but all sub-collections currently have plants in the GH and are tightly packed on benches.

Table 2. NCGC plantings according to sub-collection in 2024 and environments. Totals for 2024 are listed by sub-collection and overall. CWN 2025 shows seed already planted in Costa Rica.

	CWN 2024	CS 2024	GH 2024	Total 2024	CWN 2025
<i>G. hirsutum</i> cultivars 'SA'	50	17	8	85	161
<i>G. hirsutum</i> racestocks 'TEX'	0	17	92	109	61
<i>Gossypium barbadense</i> 'GB'	4	2	9	15	2
Asiatic/African diploid cotton	112	58	396	566	0
AD tetraploid species	0	0	4	4	0
Rest of diploid species	0	0	41	41	0
Totals	166	94	550	820	224

Table 3. Number of accessions of the NCGC newly planted at the CWN according to year and sub-collection categories. Totals for each year, 9-year span and averages are also shown.

Year	Asiatic/ African Diploids	<i>Gossypium</i> <i>barbadense</i>	<i>G.</i> <i>hirsutum</i> cultivars	<i>G. hirsutum</i> racestocks	AD (tetraploid) species	Rest of diploid species	Other	Total by year
2016	11	90	86	0	0	0	5	192
2017	0	107	62	39	0	0	0	208
2018	0	135	8	133	0	0	0	276
2019	0	87	10	276	0	1	1	374
2020	0	3	8	308	0	0	226	545
2021	0	2	135	170	0	0	0	307
2022	0	2	31	140	0	0	0	173
2023	105	2	66	0	0	0	0	173
2024	112	4	50	0	0	0	80	246
2025	0	2	161	61	0	0	0	224
Totals	228	434	609	1127	0	1	312	2718
Average	23	43	61	113	0	0	31	272

CWN “Other” are accessions increased by other cooperators and shared with the NCGC to boost increases. Hopefully more photoperiodic *G. hirsutum* and *G. barbadense* can be grown at the CWN. Previously they were planted at the CS field for collection of descriptors and images, but few flowered and still need the CWN for increases. An increased emphasis was placed on increasing the Asiatic/African diploid cotton sub-collection because of low germination/viabilities. These were also started in USDA greenhouses and the most critical accessions remain there until successfully increased at the CWN or CS fields. GH contain 34 species of *Gossypium*, 948 accessions, with column GH reporting just the 550 accessions of 26 species that produced seed (31K+) in 2024.

Table 4. NCGC plantings in College Station, TX summer field plots (CS) according to sub-collection. Totals for each year, 8-year span and averages are also shown, and also listing totals for greenhouses, CWN and overall.

Year	Asiatic/ African Diploids	<i>G.</i> <i>barb.</i>	<i>G. hirs.</i> cultivars	<i>G. hirs.</i> racestocks	AD (tetraploid) species	Rest of diploid species	Other	CS total	GH total	CWN total	Grand total
2016	0	6	50	592	0	0	0	648	163	192	1003
2017	0	2	64	650	0	0	0	716	185	208	1109
2018	2	18	63	312	6	4	150	555	114	276	945
2019	14	7	66	10	0	9	0	106	135	374	615
2020	6	2	117	0	0	9	0	134	132	545	811
2021	6	4	89	69	0	6	0	174	166	307	647
2022	25	2	11	0	0	5	0	43	273	173	489
2023	152	2	8	0	0	0	0	162	484	173	819
2024	58	2	17	17	0	0	0	94	550	246	950
Totals	263	45	485	1650	6	33	150	2632	2202	2494	7388
Average	29	5	54	183	1	4	17	294	245	271	821

*GH total adjusted for count of accessions with actual seed production in the year

Distribution & Acquisition

Distributions are in a constant state of flux and final distribution can differ from original orders in GG. Handling the data as received and distributed (Table 5) illustrates the extent of demand, highlights critical accessions in need of seed increase, and reflects the delays and changes up to the final shipment and logging items into GG distribution. Final distribution varies according to actual seed availabilities and other adjustments/substitutions, etc. *Not shown is the DBMU removal of numerous characterized as ‘Non Research Requests’.* For the purposes of graphing 2024 data with previous years, Figures 2&3 use the sum of both columns. “Items” sum all requests, including multiple/repeated requests for the same accession. Received data is entered into local excel spreadsheets that can be further totaled by user, sub-collection and individual accessions whereas GG is only data that is processed and finally ‘shipped’ by curator/technician.

Universities were the most active in the utilization of the NCGC with 16 requests for 852 items (sum of ordered and sent). The other major categories of USDA-ARS and US commercial were second and third respectively with 5 and 8 requests respectively. Because there are always delays and changes from the original requests to final delivery, reporting also includes original receipt of orders (not

shown and recorded by GG email alerts) and items, which for 2024 were 68 orders (60 US, 8 foreign users) and for 3403 items (3152 US, 251 foreign). Of the 3403 items, 1556 is the accession (not item) total, which remain when multiple requests per accession were reduced to just one. Therefore, significant processing of orders and items occur, examples being removal of duplicates, unavailable accessions (critical seed inventory), and combining multiple orders from the same users. Delays in processing orders or sometimes abandonment occurs in cases of inability to meet import requirements by the foreign users. These are only evident when accounting for original requests but still involve time of the NCGC. Reporting also includes portraying the distribution activities over years because it tends to fill in some of the gaps of orders and items of previous years and helps the NCGC prioritize future NCGC increase activities to keep up with demand. The demand was highest for *G. hirsutum* cultivar and germplasm sub-collection, followed by wild/TEX sub-collection, diploid cotton, *G. barbadense*, exotic diploid *Gossypium* species and lastly the exotic tetraploid species.

Table 5. Orders and items requested and delivered by the NCGC in 2024 according to user category. Items requested by US, Foreign users and totals by NCGC sub-collection are also shown.

User category	Requested		Delivered	
	Orders	Items	Orders	Items
STA US state agencies and all universities	3	9	13	843
UARS Agricultural Research Service	1	1	4	10
UCOM US commercial company	1	547	7	764
UIND US individual no affiliation	n/a	n/a	2	59
UPRU US non-profit organizations	n/a	n/a	n/a	n/a
UFED US Federal agency (not AID or ARS)	n/a	n/a	1	3
FCOM Foreign commercial company	1	28	1	20
FPRU Foreign non-commercial org.	4	214	1	9
Grand Totals	10	799	29	1705

Sub-collection	Items requested		
	US	Foreign	Total
A1/A2 diploid cotton	220	63	283
<i>G. barbadense</i>	161	10	171
<i>G. hirsutum</i> improved	2236	145	2381
<i>G. hirsutum</i> wild/TEX	417	23	440
Tetraploid species	40	2	42
Diploid species	78	8	86

A display of orders per year since 2006 shows a consistent decline (Figure 1) since 2020. The best explanation is the screening out orders that are Non-Research Requests. Also, past users may have retired, or their programs combined, or even whole companies merged into larger conglomerates. But the total items requested continue to rise as seen in Figure 2.

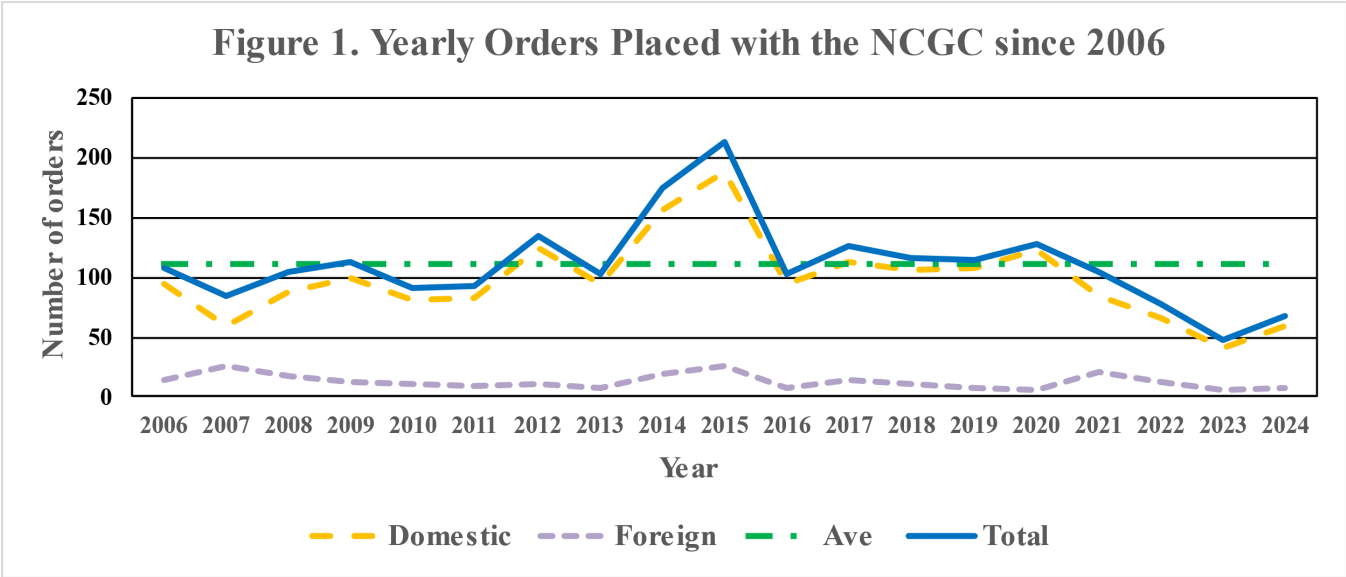
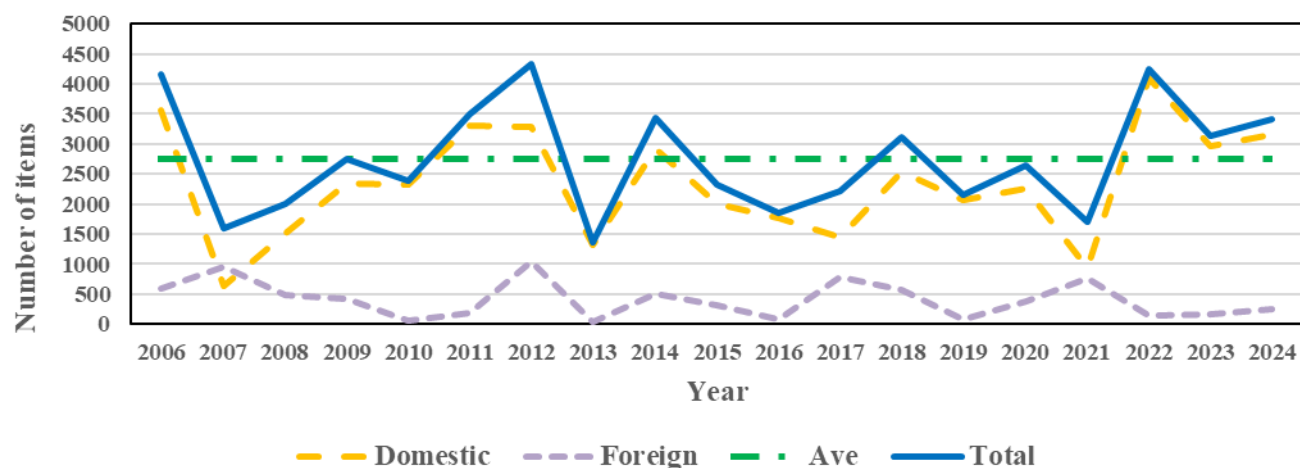
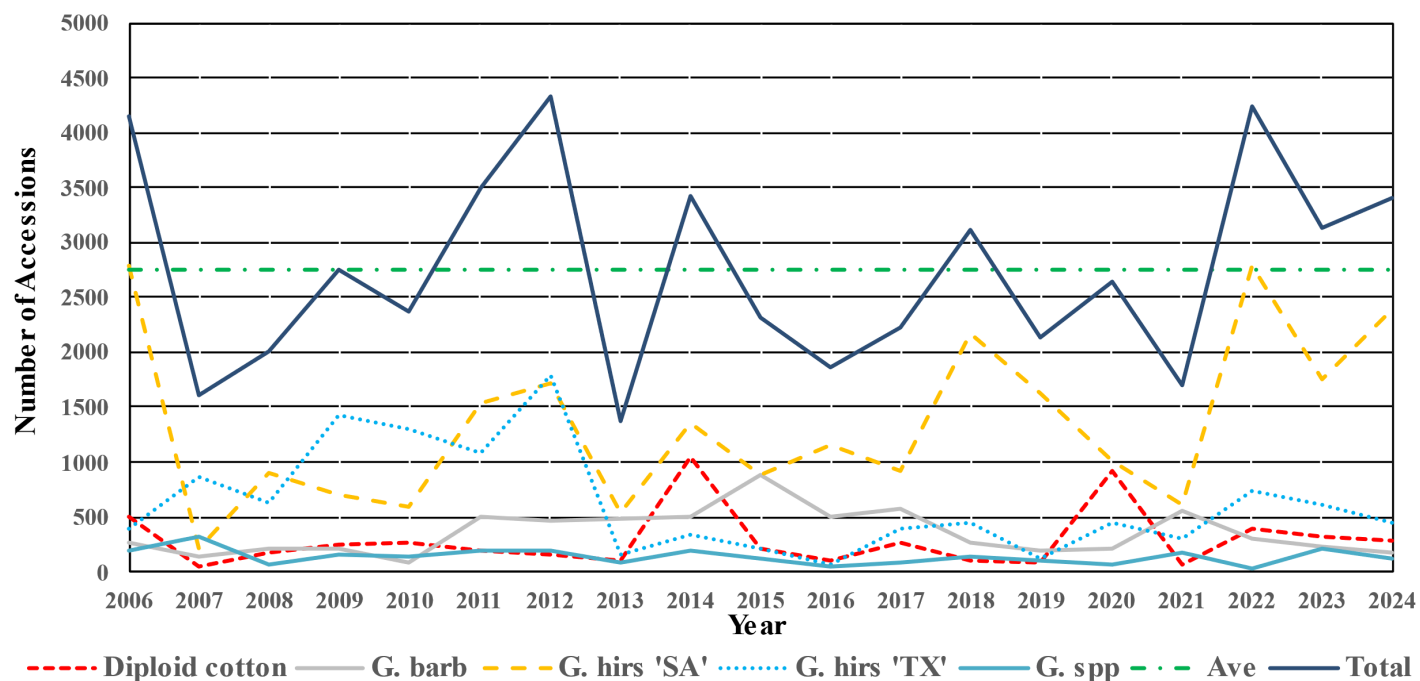


Figure 2. Yearly Requests of Items from the NCGC since 2006



New users accounted for continued occurrence of large and/or frequent orders. Items requested are further partitioned according to NCGC sub-collection in Figure 3. Most requests are for cotton *G. hirsutum* accessions and tied tightly to breeding for improvement. The next most requested is the *G. hirsutum* landrace/wild cotton sub-collection (prefix TEX for NCGC inventories) and is the next most readily accessible genetic source for cotton improvement. However, most of these accessions are from the tropics and still require short daylength to flower and set bolls. Their seed increase and cross pollination with cotton requires cultivation in a tropical nursery or in greenhouses. The next most requested are accessions of the diploid cotton species *G. arboreum* and *G. herbaceum*. They still have valuable traits for improvement and are homoeologous with the A subgenome of *G. hirsutum*. The next most requested are the tetraploid and diploid *Gossypium* species. Breeding is more difficult, especially with the diploids but value still exists in traits for cotton improvement, and research into the *Gossypium* genome. The last sub-collection is *G. barbadense* and appears underutilized but is still a valuable source of genetic diversity and readily accessible to breeders of Pima and Egyptian cotton.

Figure 3. Yearly Requests of Items by Subcollection since 2006



GRIN-Global has a feature to show the top accessions distributed and for 2024 TAMCOT SPHINX (SA 2292 PI 592801) was the top with 9 (Table 6). Only one wild cotton or landrace made the top 15 otherwise they were all *G. hirsutum* cultivars, and 6 from Texas A&M breeding programs. Because of a break in the years with using GG for final processing of orders and items, the data on total accession requests going back to 2006 used excel spreadsheets that were built upon recording the original incoming requests (Table 7). The top request in this 19-year period was Coker 312 (SA 1213 PI 529278 with 85 requests, closely followed by a wild collected *G. barbadense* Inca Cotton (GB 713 PI 608139) with 71 requests made. *G. barbadense* still had popularity with several other accessions of PIMA and Sea Island pedigree. Other pedigrees of *G. hirsutum* cotton are reflected in the top list and several diploid exotic species of *G. raimondii* and *G. longicalyx*. *G. raimondii* is considered a living descendent of the likely progenitor of the D subgenome of cotton, and *G. longicalyx* was once used to introgress genes for resistances to nematodes. More request totals are included all the way down to those just requested once (1258) and not at all (1707). It is difficult to keep inventories up to date so users do request unavailable items because the critical quantity was not updated or the inventory (n/a) trigger set lower. Those with recently harvested seeds need faster updating in GG to help users request them successfully.

Table 6. Most sent *Gossypium* accessions of the NCGC in 2024.

Inv Prefix	Inv Num	Taxon	PI	Name	Sent
SA	2292	<i>G. hirsutum</i>	529278	TAMCOT SPHINX	9
SA	1583	<i>G. hirsutum</i>	529637	TAMCOT SP-37	6
SA	1723	<i>G. hirsutum</i>	547084	LA-887	6
SA	1742	<i>G. hirsutum</i>	552537	GEORGIA KING	6
SA	3134	<i>G. hirsutum</i>	564768	TAMCOT CAB-CS	6
SA	2261	<i>G. hirsutum</i>	591419	PD 93009	6
SA	3144	<i>G. hirsutum</i>	600977	BRONCO 625	6
SA	3547	<i>G. hirsutum</i>	647088	NIBGE-2	6
TEX	1521	<i>G. hirsutum</i>	464845	JMS-12, Australia wild cotton	5
SA	741	<i>G. hirsutum</i>	528932	FREGO VIRESCENT	5
SA	1469	<i>G. hirsutum</i>	529523	STONEVILLE 506	5
SA	1565	<i>G. hirsutum</i>	529619	PD 3246	5
SA	1580	<i>G. hirsutum</i>	529634	TAMCOT SP-21	5
SA	1636	<i>G. hirsutum</i>	533642	PD 778	5
SA	2350	<i>G. hirsutum</i>	538033	TAMCOT HQ95	5
SA	1763	<i>G. hirsutum</i>	564679	MISCOT 8001	5
SA	2209	<i>G. hirsutum</i>	572268	LA 850082FN	5
SA	2316	<i>G. hirsutum</i>	595852	ARKOT 8102	5
SA	3107	<i>G. hirsutum</i>	600895	CASCOT C-13	5
SA	3771	<i>G. hirsutum</i>	601708	GREEN	5
SA	3778	<i>G. hirsutum</i>	634320	CABCSV506S-1-94	5
SA	3517	<i>G. hirsutum</i>	636491	TAM 98D-99ne	5

Table 1 shows addition of new accessions to the NCGC since 2006 (791) according to sub-collection. Delays in addition of new accessions are typically explained by the testing for Adventitious Presence (AP) of genetically engineered constructs or “GMO”, seed increases to enough for distribution, and assignment of PI numbers in GG. Since 2014 nearly 300 conventionally bred cotton accessions were tested for Cry1Ac, Cry2A and Cp4 EPSPS (Bollgards 1&2 and Roundup Ready) with immunostrips, often provided to us by cooperators. A portion were positive (70) for AP and remain in the “pending acquisition” list until clean seed can be provided to the NCGC. Also pending are those recently released from NCGRL (50) and donated directly from the developer (high oleic acid lines) or from other collections such as EMBRAPA or Cotton Seed Distributors (Australia). *G. barbadense* are split between cultivars (17) and wild collected (15), mostly from expeditions by Mauricio Ulloa and James McD Stewart. Wild *G. hirsutum* was from collection trips by Mauricio Ulloa and James Stewart. Additional wild *G. hirsutum* accessions were found by the NCGC in Puerto Rico in 2013. A more recent trip in South Florida in 2019 found a dozen more but is still pending germination in USDA greenhouses and assignment of PI numbers. Their acquisitions were made possible by assistance/donation from Sanibel-Captiva Conservation Foundation, Shelby Gardens, Neal Preserve, Bowman Park, Mike Dowd). Several tetraploid species were donated by Iowa State (Prof. Jonathan Wendel) and National Tropical Botanical Garden of Maui (Margaret Clarke). Accessions of Australian diploid species were collected by James Stewart and collaborators or donated by CSIRO and established in USDA greenhouses. D genome species were found by Mauricio Ulloa and James Stewart in 2002-2003. Additional accessions of *G. thurberi* were collected by the NCGC in 2017 and 2017 and donated from other sources (Phytogen, Scott Chamberlain, Millenium Seed Bank, US Forestry Service, Karen Williams). The recent NCGC collection trips were confined to US and Territories because of increasing difficulties in permitted access to foreign germplasm.

Table 7. Most requested *Gossypium* accessions of the NCGC since 2006.

Inv Prefix	Inv Num	Taxon	PI	Name	Req.
SA	1213	<i>G. hirsutum</i>	529278	COKER 312	85
GB	713	<i>G. barbadense</i>	608139	INCA COTTON	71
GB	1023	<i>G. barbadense</i>	560140	PIMA S-7	67
SA	2269	<i>G. hirsutum</i>	607172	TM 1	61
GB	1030	<i>G. barbadense</i>	608346	PIMA S-6	60
SA	1184	<i>G. hirsutum</i>	529249	COKER 310	59
SA	1611	<i>G. hirsutum</i>	606809	DES 119	58
SA	1512	<i>G. hirsutum</i>	529566	DELTAPINE 50	55
SA	1475	<i>G. hirsutum</i>	529529	DELTAPINE 90	51
SA	97	<i>G. hirsutum</i>	528504	SUPER OKRA	49
SA	2288	<i>G. hirsutum</i>	540885	ACALA MAXXA	47
SA	3	<i>G. hirsutum</i>	528420	ARKANSAS GREEN	47
SA	24	<i>G. hirsutum</i>	528441	RED OKRA GREEN	47
GB	1381	<i>G. barbadense</i>	630149	PIMA OKRA LEAF	45
D ₅	31	<i>G. raimondii</i>	530928		44
SA	1723	<i>G. hirsutum</i>	547084	LA-887	44
SA	1668	<i>G. hirsutum</i>	606814	PAYMASTER HS 26	44
SA	2291	<i>G. hirsutum</i>	607174	DELTAPINE 61	43
D ₅	1	<i>G. raimondii</i>	530898		43
GB	679	<i>G. barbadense</i>	608115	BLEAK HALL SEA ISLAND	42
F ₁	1	<i>G. longicalyx</i>	530986		42
SA	2580	<i>G. hirsutum</i>	612326	ACALA 1517-99	41
D ₅	2	<i>G. raimondii</i>	530899		41
SA	240	<i>G. hirsutum</i>	528608	ACALA RED OKRA	41
				38 accessions	30-40
				204 accessions	20-29
				1356 accessions	10-19
				3661 accessions	4-9
				890 accessions	3
				982 accessions	2
				1258 accessions	1
				1707 not requested	0

Databases

Descriptors and images were collected on accessions in the CWN and College Station. Often the images collected at the CWN are primarily to fill in gaps especially if displaying photoperiodic flowering response, but all descriptors (except photoperiodic rating) are also scored at the CWN. Data from 2024 College Station is being prepared for uploading into GRIN-Global. Table shows a summary of seed descriptors gathered from systematic germination testing of the *G. herbaceum* and *G. arboreum* seed inventories.

Table 8. Traits collected for *Gossypium* species and uploaded to GRIN-Global

Sub-collection species	Trait	Data points
<i>G. herbaceum</i>	GermPercent1week	401
<i>G. herbaceum</i>	GermPercent1month	148
<i>G. herbaceum</i>	Seed Index	408
<i>G. arboreum</i>	GermPercent1week	2785
<i>G. arboreum</i>	GermPercent1month	96
<i>G. arboreum</i>	Seed Index	2753

Continued Work and Analysis

Replacement of Janna Love with a new technician is essential for continuity of the NCGC activities. Backlogs in processing recent harvests and updating GRIN-Global inventories must be addressed and help to reduce number of request denials in seed orders. Summary of the activities are also being included in a possible publication concerning the genetic utilization of the NCGC. Hopefully a steady increase in commitment to seed increases in all locations and better micromanagement of sub-collections and exotic accessions will revive and make accessible more of the NCGC to users. The NCGC needs to resume regular inventory and seed germination/viability assessment of another sub-collection to better prioritize seed increases.

New accessions received from Fort Collins were shelved because of testing for adventitious presence “AP” of genetically engineered constructs or “GMO” or “GEO”. Since 2014 Lori Hinze has tested over 250 conventionally bred cotton accessions for Cry1Ac, Cry2A and Cp4 EPSPS (Bollgard 1&2 and Roundup Ready) with immunostrips, often provided to us by cooperators. Of these 70 had at least one positive test, and 6 need re-testing. The ones that cleared the testing resulted, so far, in 8 and 131 additional *G. barbadense* and *G. hirsutum* accessions respectively in the NCGC. The 70 AP accessions will need assistance from the developers to provide a clean source to the NCGC. Fifty more were recently released to us and await testing. Bollgard® and other Plant Insecticidal Protein accessions are not accepted by the NCGC because of uncertainty in their handling, permissions to grow, and regulation by the EPA. The NCGC is anxious to distribute released germplasm but must first do the requisite for AP and do the initial seed increases to generate fresh and viable seed quantities for long term storage and distribution.

Recent Changes

The CWN is still operated by Alfonso Palafox, but new land and storage had to be purchased and prepared by Alfonso. Hopefully more space can be committed to the photoperiodic, often perennial wild collected cotton (TEX and a portion of GB accessions). Our technician Janna Love retired after 30+ years of service. She left an impressive mark on the NCGC with fulfilling thousands of seed requests, tracking inventories and arranging for seed increases and characterizations at the CWN and College Station. She transitioned the NCGC from the old GRIN to GRIN-Global and integrated barcoding and digital images. Finding a replacement and handling immediate operations will be difficult. Current operations are to finalize inventories from recent seed increases and do a systematic inventory of another sub-collection, *G. barbadense*. Previously the Asiatic/African diploid cotton sub-collection were re-evaluated for inventory and seed germination and helped to prioritize increases in the field and at the CWN. After the results of seed germination, plants of the most critical accessions (low, old or poorly germinating) were kept in greenhouses and transplanted to College Station field to generate fresh inventories. Successes are limited at the CWN because of germination difficulties with this sub-collection and greenhouses are expected to continue to be full of their plants. Additional results were gathering of descriptors Seed Index, GermPercent1week and where applicable GermPercent1month. This is a relatively new operation that must be regularly conducted to assess viability of the NCGC and prioritize seed increases at the CWN, and field and greenhouse resources.

Analysis

Resources for seed increases are increasing in costs while financial support remains steady. Greater commitment to accession increases is needed to keep the seed of all sub-collections viable and meet increasing demand from users. Excess seed is needed for long term storage at Fort Collins, CO but is threatened by urgent demands by users of fresh seed of critical accessions. A better balance is needed to sustain seed increase activities of the more easily curated sub-collection and accessions along with intensive care of the critical ones. Germination tests are routinely scheduled to update inventories and characterize accession inventories by viability and better prioritize seed increases with the limited resources. Collection of descriptor data and digital images to enrich the GRIN-Global and CottonGen databases still proceed but to a lesser extent because of limited resources to increase diverse portions of the large cotton collection (where most gaps remain). Descriptors or data such as seed index and seed germination are the bulk of the data collected to prioritize critical seed replenishments.