



Evaluation of Florida Accessions of *Mimosa strigillosa*

Janet Grabowski*

ABSTRACT

The United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Brooksville Plant Materials Center (PMC) evaluated 69 accessions of powderpuff (*Mimosa strigillosa* Torr. & A. Gray) for their seed production potential. Included were 67 accessions collected throughout Florida, Crockett Germplasm released by the East Texas PMC in Nacogdoches, and a potted plant from a Florida nursery. Evaluation plots were planted at the Brooksville PMC and University of Florida research stations at Ona and Quincy. Eleven of the Florida-collected accessions were selected based on their superior seed pod production at two or all three of the evaluation sites. We recommend that these accessions be recollected and used to develop a polycross seed source of powderpuff that can be planted throughout the state to revegetate and stabilize soils and provide wildlife and pollinator habitat.

INTRODUCTION



Figure 1. Distribution of *Mimosa strigillosa* in Florida (Wunderlin et al., 2019)

Powderpuff, also known as herbaceous mimosa or sunshine mimosa, is a low growing, native perennial legume. It is widely distributed in Florida, except for the western panhandle (Fig. 1); however, there are some authorities that question its nativity in south Florida (McLaughlin et al., 2003). Plants may be translocated to south Florida and other locations in the state through low quality sod, containing powderpuff plants in addition to turf grasses, being used to revegetate following road construction (M.J Williams, personal communication). Powderpuff is also found in Georgia, Mississippi, Arkansas, Louisiana, and Texas (USDA, NRCS, 2019). It was given the common name powderpuff because the showy, circular clusters of tubular pink flowers resemble a lady's powderpuff (Norcini and Aldrich, 2007a). In Florida, its main flowering period is in late spring,

although it will produce sporadic flowers throughout the growing season (Norcini and Aldrich, 2007b). After the flowers are pollinated, clusters of rough, hairy, flattened pods form; the pods turn brown and open when mature to release the shiny brown seeds (Norcini and Aldrich, 2007a; Taylor, 2013). The leaves of powderpuff are bipinnately compound. The prostrate stems lie flat along the ground, making a thick carpet. The stems often form roots at the nodes, especially in areas where the soil remains moist (Brakie, 2011; Norcini and Aldrich, 2007a). It is classified as a facultative wetland species in its area of occurrence (USDA, NRCS, 2019); however, it is very

*Janet Grabowski, PMC Manager, Brooksville Plant Materials Center, 14119 Broad Street, Brooksville, FL 34601, 352-397-3831, janet.grabowski@usda.gov. Retired 29 Feb. 2020.

drought tolerant once established due to its deep root system (Florida Native Plant Society, 2019; Robinson and Schultz, 1994).

Powderpuff serves as a larval host plant for little sulphur butterfly (*Pyristia lisa* Boisduval & Leconte) (Norcini and Aldrich, 2007a). Flowers are primarily pollinated by honey bees (*Apis mellifera* L.) (Oecohort, 2013), but numerous other insect species have also been noted visiting the flowers, indicating that it may have potential for pollinator plantings. Powderpuff plants also provides food for various bird species in the form of insects and seeds (Brakie, 2011).

The East Texas PMC in Nacogdoches released Crockett, a selected-class germplasm of powderpuff, in 2006 for revegetation of disturbed sites. Crockett Germplasm is a single line that originated from a collection made in Houston County, Texas (East Texas PMC, 2006).

In addition to stabilizing soils, powderpuff also has excellent potential as a wildflower that can be used as a ground cover and low-traffic turf substitute (McLaughlin et al., 2003; Norcini and Aldrich, 2007a; Robinson and Schultz, 1994). Many native nurseries in Florida market mimosa plants in pots, but there are no Florida ecotypes currently available as seed.

This study to collect and evaluate Florida accessions of powderpuff began due to a need identified by the state plant materials committee to increase the number of available native species that could be planted for roadside beautification, wildlife habitat, and ecosystem restoration. In order to increase the use of powderpuff for these uses, development of a Florida-adapted seed source of powderpuff was desired.

MATERIALS AND METHODS

Powderpuff accessions for this study were assembled in 2009 and 2010. Herbarium records for powderpuff as referenced in the Atlas of Florida Plants (Wunderlin, 2019) were accessed to locate potential collection sites. Accession 421895, a Florida accession collected in 1974, was recollected from its original site. Sites were also identified by staff members driving along roads looking for powderpuff blooms. Since these populations occurred in areas that were regularly mowed, seed production was lacking. Therefore, accessions were collected as vegetative material. When a population was found, sections of stems were pulled up and placed in a plastic bag for transport to the PMC. In most instances, enough plant material was collected to fill a 26-37 l (7-10 gal) trash can liner bag. Standard plant collection information was recorded for each accession, including GPS coordinates at the collection site. Seedlings of Crockett Germplasm (accession number 9028136) and a potted plant obtained from a native plant nursery (formerly All Natives, San Antonio, FL) (accession number 9060881) were included as a known seed-producing germplasm and a representative Florida nursery type. Plants were potted in 15.2-cm (6-in) pots and held in the PMC shadehouse until planting in the study plots. Additional increase of some smaller volume collections was necessary during this holding period.

Accessions were planted in a replicated space plant trial at three locations: the Brooksville PMC (Brooksville); the University of Florida (UF), Institute of Food and Agricultural Sciences (IFAS) Ona Range Cattle Research and Education Center (Ona); and the UF/IFAS Quincy North Florida Research and Education Center (Quincy). Brooksville, located in Hernando County, is in MLRA 154 - South-Central Florida Ridge; Ona located in Hardee County is in MLRA 155 - Southern Florida Flatwoods; and Quincy located in Gadsden County is in MLRA 133 - Southern Coastal Plain. Plots were arranged in a randomized complete block at each location with three replications of each plot. Space limitations at the sites prevented planting more replications. The

powderpuff plants were planted into an existing sod of bahiagrass (*Paspalum notatum* Fluegge). Each plot was a 1.8-m x 1.8-m (6-ft x 6-ft) square area, of which the center 0.9-m x 0.9-m (3-ft x 3-ft) was sprayed with glyphosate (3% v/v solution) at least one week prior to planting. Planting dates were: Brooksville 19 July 2011; Ona 21 July 2011; and Quincy 9-10 Aug 2011. A single pot of each accession was planted in the middle of the herbicide treated area in each plot. No fertilizer was applied to the plots. Plots were mowed as necessary during the evaluation period to reduce weed competition.

The following year, survival was rated three times at quarterly intervals and in the fourth quarter (fall 2012) the spread of each plant was rated. This was done using a 1-m² (10.8 ft²) gridded quadrat frame, divided into 100 1-dm x 1-dm (3.9-in x 3.9-in) squares. The frame was laid on top of the plot with the center of the frame positioned in the center of each plot (Fig. 2). The number of squares containing a portion of a powderpuff plant were counted. This rating does not equate to total spread of each plant because many trailed beyond the edges of the quadrat frame. The most vigorous accessions also spread beyond the bounds of their plot. Spread counts were only taken at the end of the first year of growth because the accessions began to grow together quickly.

The plots were checked monthly (Apr-Aug) during 2013 for production of flowers and seed pods. When it appeared that peak production was reached at each location, we counted flowers and pods. The 1-m quadrat was also utilized for this evaluation; however, instead of counting the number of squares that contained flowers or seed pods, we counted the number of flower clusters (powderpuffs) and the number of pods that occurred within the entire 1-m square area. Determining the plot origin of flower clusters and pods required some tracing of stems back to their source. Flower clusters were counted at each site on two dates several weeks apart and the numbers from each date were added together for analysis. Seed pods were similarly counted on two dates and summed to determine total pod production; care was taken to not count open pods with no remaining seeds during the second count to prevent double counts of pods.



Figure 2. One-meter-square quadrat used to determine plant spread. White PVC pipe marks the center of the plot.

The tables in Appendix A contain the raw data set for each location. There were numerous missing plots caused by dead plants as well as absence of flowers and pods on some surviving plants, which made statistical analysis to determine differences between accessions problematic. Therefore, data in the results and discussion section are presented as simple averages for each accession. There was no attempt to account for missing plots when calculating averages.

RESULTS AND DISCUSSION

There were 35 accessions with above average spread within the one square meter frame recorded at Brooksville, 31 at Ona, and 30 at Quincy (Table 1). Ten of these accessions had spread counts that were above average at all three sites. These accessions were 9028136 (Crockett Germplasm); 9060771; 9060809; 9060809; 9060812; 9060826; 9060827; 9060830; 9060831; and 9060836. Eight accessions with above average spread at both Brooksville and Ona were

9060733; 9060739; 9060745; 9060817; 9060821; 9060832; 9060835; and 9060840. Six accessions with above average spread at Brooksville and Quincy were 421895; 9060727; 9060729; 9060837; 9060871; and 9060878. Seven accessions with above average spread at Ona and Quincy were 9060702; 9060735; 9060740; 9060812; 9060815; 9060816; and 9060819 (Table 1).

Table 1. Powderpuff accessions with powderpuff plants spread counts greater than the average of the spread counts recorded at each location during the fall of 2012. Planting locations were the USDA, NRCS Brooksville Plant Materials Center (Brooksville), the UF/IFAS Ona Range Cattle Research and Education Center (Ona), and the UF/IFAS Quincy North Florida Research and Education Center (Quincy).

Brooksville		Ona		Quincy	
Accession	Average Spread ¹ (no. sq dm)	Accession	Average Spread ² (no. sq dm)	Accession	Average Spread ³ (no. sq dm)
9060837	57	9060739	49	9060815	53
9060817	55	9060741	47	9060837	53
9060812	52	9060817	44	9060823	50
9060739	52	9060830	42	9060827	49
9060820	49	9060746	42	9028136	48
9060827	49	9060735	39	9060812	46
9060813	46	9060745	36	9060729	40
9060881	44	9060832	36	9060744	38
9060872	43	9060809	34	9060830	38
9060831	42	9060811	33	9060702	37
9060809	40	9060815	32	9060814	37
9060830	40	9060812	31	9060816	37
9060832	40	9028136	29	421895	36
9060745	39	9060836	29	9060878	36
9060724	39	9060861	28	9060735	33
9060733	37	9060702	28	9060871	32
9060833	36	9060831	27	9060880	31
9060836	34	9060835	25	9060819	30
9060878	34	9060862	25	9060727	29
9060725	34	9060816	25	9060731	29
9060741	34	9060874	25	9060741	29
9060840	33	9060818	24	9060809	29
421895	30	9060826	24	9060873	27
9060821	30	9060840	24	9060824	27
9060835	30	9060740	23	9060831	25
9060839	29	9060733	23	9060740	24
9060729	28	9060731	22	9060739	24
9028136	28	9060827	20	9060826	24
9060871	28	9060743	20	9060836	23
9060727	26	9060819	19	9060838	23
9060826	26	9060821	19		
9060734	26				
9060828	26				
9060731	25				
9060834	25				
Location Average	25	Location Average	19	Location Average	22

¹ Plant spread at Brooksville was determined using a one square meter frame with strings attached every ten centimeters, dividing the frame into 100 square decimeters (dm) on 17 Sep 2012. The frame was placed over the plots and the number of squares that contained a portion of a mimosa plant were counted. Values presented are the average counts for each accession from three replications. Note: this was not the total spread of each plant because many grew beyond the edges of the meter frame.

² Plant spread at Ona was measured as described above on 23 Aug 2012.

³ Plant spread at Quincy was measured as described above on 11 Sep 2012.

Flower clusters at each location were only counted on two dates at each location. Since the flowers are transitory, the counts of flower clusters shown in Table 2, which are the sum of the number counted on both dates, are only a snapshot of the number of clusters each accession produced at the times they were counted. Although these numbers may not accurately reflect the true annual flowering potential of each accession, they do allow a rough comparison between accessions. There were 20 accessions with flower counts that were above the average number of

clusters counted at Brooksville. Accessions with above average flower counts numbered 26 at Ona and 23 at Quincy. Of these, nine accessions had above average flower counts at all three locations. These accessions were 9060743; 9060744; 9060814; 9060815; 9060816; 9060827; 9060832; 9060836; and 9060871. Three accessions, 9060812; 9060826; and 9060878, had above average flower counts at both Brooksville and Ona. There were also three accessions with greater flower production at both Brooksville and Quincy and these were 9060830, 9060837, and 9060838. Five accessions with above average flower counts at Ona and Quincy were 9060726; 9060817; 9060831; 9060833; and 9060880 (Table 2).

Table 2. Powderpuff accessions with average number of flower clusters (powderpuffs) that were greater than the average number of flower clusters counted per location during the summer of 2013. Planting locations were the USDA, NRCS Brooksville Plant Materials Center (Brooksville), the UF/IFAS Ona Range Cattle Research and Education Center (Ona), and the UF/IFAS Quincy North Florida Research and Education Center (Quincy).

Brooksville		Ona		Quincy	
Accession	Average No. Flowers ¹	Accession	Average No. Flowers ²	Accession	Average No. Flowers ³
9060725	50	9060833	9	9060832	32
9060815	38	9060816	8	9060815	16
9060837	25	9060812	6	9060816	14
9060830	20	9060740	6	9060873	14
9060832	16	9060879	6	9060837	13
9060838	16	9060735	4	9060744	12
9060814	15	9060832	4	9060830	11
9060816	14	9060743	4	9060726	11
9060824	14	9060815	3	9060814	10
9060826	12	9060831	3	9060819	9
9060743	12	9060731	3	9060831	9
9060862	10	9060814	3	9060871	8
9060744	10	9060726	3	9060827	8
9060812	10	9060744	3	9060743	7
9060828	10	9060818	3	9060817	7
9060827	9	9060827	3	9060833	7
9060878	9	9060871	3	421895	7
9060819	9	9060809	2	9060838	6
9060836	9	9060817	2	9060732	6
9060871	8	9060821	2	9060880	6
		9060836	2	9060823	6
		9060741	2	9060836	5
		9060826	2	9060881	5
		9060877	2		
		9060878	2		
		9060880	2		
Location Average	7	Location Average	2	Location Average	5

¹ Number of flower clusters inside a one-meter square frame were counted at Brooksville on 4 Jun 2013 and 25 Jul 2013 and the counts from the two dates were added together to determine a total number of flower clusters produced; values presented are the average of total flower cluster numbers for each accession from three replications.

² Flower clusters at Ona were counted on 13 Jun 2013 and 11 Jul. 2013 as described above.

³ Flower clusters at Quincy were counted on 11 Jun 2013 and 17 Jul 2013 as described above.

Powderpuff seed pods were more persistent than the flower clusters; therefore, the number of pods for accessions presented in Table 3 are likely a more accurate reflection of annual seed pod production than the flowering data presented previously. The overall average number of seed pods produced was highest at Quincy, followed by Brooksville and Ona (Table 3). Quincy, in the Coastal Plain, is an area of Florida characterized by having well-drained loamy or sandy soils underlain by loamy subsoils that are suitable for producing several types of crops. Soils at Brooksville in the Central Ridge are excessively drained sands, that are better suited to pastures than most types of crop production. The Florida Flatwoods soils at Ona are poorly drained sands where the water table during the growing season is often at or near the soil surface. Flatwoods areas of Florida are also primarily used for pastures rather than crop production (Watts and Collins, 2008). Although classified as a facultative wetland species (USDA, NRCS, 2019), it appears that powderpuff seed production potential may be greater in more fertile, well drained soils, such as those in Quincy than in the excessively wet soils at Ona or the dry, infertile soils at Brooksville.

There were 21 accessions with above average pod production at Brooksville, 20 accessions with above average pod production at Ona, and 22 accessions with above average production at Quincy (Table 3). Of these, there were seven accessions that produced above average number of pods at all three locations. These were 9060726; 9060740; 9060815; 9080816; 9060825; 9060827; and 9060838. Two accessions produced an above average number of pods at Brooksville and Ona; these were 9060836 and 9060879. Four accessions, 9060739; 9060830; 9060837; and 9060872, produced an above average number of pods at Brooksville and Quincy. Three accessions produced an above average number of pods at Ona and Quincy; these were 9060744, 9060814, and 9060831 (Table 3). Neither Crockett Germplasm (9028136) nor the Florida nursery stock plant (9060881) were amongst the higher seed pod producing accessions at any evaluation site.

Table 3. Powderpuff accessions with average number of seed pods that were greater than the average number of seed pods counted per location during the summer of 2013. Planting locations were the USDA, NRCS Brooksville Plant Materials Center (Brooksville), the UF/IFAS Ona Range Cattle Research and Education Center (Ona), and the UF/IFAS Quincy North Florida Research and Education Center (Quincy).

Brooksville		Ona		Quincy	
Accession	Average No. Pods ¹	Accession	Average No. Pods ²	Accession	Average No. Pods ³
9060838	32	9060816	22	9060830	149
9060725	30	9060740	22	9060744	74
9060824	27	9060827	21	9060726	40
9060815	22	9060879	18	9060815	38
9060740	19	9060831	17	9060831	34
9060837	19	9060735	16	9060837	34
9060816	17	9060744	15	9060816	33
9060830	17	9060825	14	9060825	33
9060825	11	9060836	12	9060823	29
9060836	11	9060741	11	9060819	27
9060827	9	9060838	10	421895	25
9060839	9	9060729	8	9060838	25
9060726	8	9060833	8	9060827	24
9060879	8	9060743	8	9060871	20
9060734	7	9060815	7	9060872	19
9060872	7	9060731	7	9060832	19
9060878	7	9060817	6	9060821	18
9060739	6	9060726	6	9060814	18
9060826	6	9060814	5	9060739	17
9060862	6	9060745	5	9060877	15
9060874	6			9060873	15
				9060740	15
Location Average	6	Location Average	4	Location Average	14

¹ Number of pods inside a one-meter square frame were counted at Brooksville on 4 Jun 2013 and 25 Jul 2013 and the counts from the two dates were added together to determine a total number of pods produced; values presented are the average of total pod numbers for each accession from three replications.

² Pods at Ona were counted on 13 Jun 2013 and 11 Jul 2013 as described above.

³ Pods at Quincy were counted on 11 Jun 2013 and 17 Jul 2013 as described above.

Since the objective of this study was to develop seed sources of powderpuff, identification of superior accessions was based on the seed pod production data we collected. It has been documented that powderpuff is pollinated by honey bees (Oecohort, 2013), so it is likely an outcrossing species that requires genetic contributions from separate male and female populations to produce seed. However, even if powderpuff plants are capable of self-pollination, it is desirable for potential plant releases to include greater genetic diversity to increase chances for successful establishment over a broader geographic area and provide for greater environmental resilience. Therefore, we were not attempting to select a single line for future increase and release, but to identify superior accessions that could be used in a polycross. We limited our selection to those accessions with seed production that was above average for at least two of the evaluation sites (Table 3). This selection criteria increased both the geographic options for seed production and the chances of future established plantings being capable of

producing seeds throughout a larger portion of the state. The eleven superior powderpuff accessions we selected are shown in Table 4 on Page 10. Included in this table are the counties and GPS locations of the collection sites.

Figure 3 on Page 12 shows a map of Florida with the location of the three evaluation sites, indicated by stars, and the collection locations of the selected accessions, marked with pin symbols (accessions are identified by the last three digits of their accession numbers). These collection sites cover a large portion of the geographic distribution of powderpuff shown in Figure 1. It is interesting to look at the performance of certain accessions in relation to their counties of collection. Generally, one would expect accessions to perform best at evaluation sites that are at a similar latitude as their collection site. For example, the accessions 9060830 and 9060744 that produced the most seed pods at Quincy were collected at almost the same latitude in Madison County, just three counties east of this evaluation site in Gadsden County. But, accession 9060726 that is from a similar latitude as Brooksville was a good pod producer at Quincy, but not at Brooksville. One would also expect that accession 9060740 from Hernando County would be the top pod producer at Brooksville in its home county; but 9060838, collected in Alachua County, several counties north of Brooksville, was far more productive at this site. Because there does not appear to be a consistent trend between seed production and north-south location of the collection sites, we recommend that all eleven accessions be included in a polycross to produce seed for use throughout Florida. It is suggested that growers or other interested parties return to the original collection sites and collect vegetative material for planting in a polycross block. Pitman (2009) indicated that a lack of seedling vigor may be a hinderance to establishment of powderpuff seedlings. Further selection for improved seedling vigor out of seedlings derived from the polycross may further refine a powderpuff seed source for improved success in conservation plantings.

CONCLUSIONS

This research showed that there were differences in growth and seed production among powderpuff accessions collected in Florida. The sites where these accessions were evaluated represented three of the major geographic and land resource regions within the state. Since there was a great deal of commonality in performance of several accessions at these evaluation sites, this indicated that they could be utilized to develop a powderpuff seed source with broad adaptation in Florida. The eleven accessions selected in Table 4 were those that showed the greatest potential to develop this seed source.

LITERATURE CITED

- Brakie, M. 2011. Plant Guide for powderpuff (*Mimosa strigillosa*). USDA-Natural Resources Conservation Service, East Texas Plant Materials Center, Nacogdoches, TX 75964. https://plants.sc.egov.usda.gov/plantguide/pdf/pg_mist2.pdf (accessed 4 Feb 2019).
- East Texas PMC. 2006. Release brochure for Crockett herbaceous mimosa select germplasm. USDA, NRCS East Texas Plant Materials Center, Nacogdoches. https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/etpmc10847.pdf (accessed 17 Apr 2019).
- Florida Native Plant Society. 2019. *Mimosa strigillosa* sunshine mimosa, powderpuff. <https://www.fnps.org/plants/plant/mimosa-strigillosa> (accessed 2 Feb 2019).
- McLaughlin, J., L. Vasquez, and J., Haynes 2003. Native landscape plants for south Florida. IFAS Publication ENH 875, University of Florida, Gainesville. (No longer available online; copies can be obtained from the USDA, NRCS Brooksville Plant Materials Center.)
- Norcini, J.G., and J.H. Aldrich. 2007a. Native wildflowers: *Mimosa strigillosa* Torr. & A. Gray. IFAS Publication ENH 1075, University of Florida, Gainesville. (No longer available online; copies can be obtained from the USDA, NRCS Brooksville Plant Materials Center.)
- OecoHort, LLC. 2013. Sunshine Mimosa *Mimosa strigillosa* Torr. & A. Gray. Wildflower Seed and Plant Growers Association. <https://www.floridanativenurseries.org/info/wp-content/uploads/2013/06/SunshineMimosa-May2013.pdf> (accessed 5 Jun 2013).
- USDA, NRCS. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. USDA Handbook 296.
- Norcini, J.G., and J.H. Aldrich. 2007b. Performance of native Florida plants under north Florida conditions. IFAS Publication ENH 1074, University of Florida, Gainesville. <https://edis.ifas.ufl.edu/ep341> (accessed 7 Feb 2019).
- Pitman, W.D. 2009. Establishment and survival of native legumes on upland sites in Louisiana. *Native Plants* 10:240-250.
- Robinson, M.L., and U.E. Schultz. 1994. New introductions of drought tolerant plant materials for parking lots and highway medians. *Proc. Fla. State Hort. Soc.* 107:194-196.
- Taylor, W.K. 2013. *Florida wildflowers: a comprehensive guide*. Univ. Press of Florida, Gainesville.
- USDA, NRCS. 2019. The PLANTS database. National Plant Data Team, Greensboro, NC. <http://plants.usda.gov> (accessed 15 Jan 2019).
- Watts, F.C., and M.E. Collins. 2008. *Soils of Florida*, Soil Science Society of America, Madison, WI.

Wunderlin, R.P., B.F. Hansen, A.R. Franck, and F.B. Essig. 2019. Atlas of Florida plants. [S.M. Landry, and K.N. Campbell (application development), USF Water Institute.], Institute for Systematic Botany, University of South Florida, Tampa. <http://florida.plantatlas.usf.edu/> (accessed 15 Jan 2019).

Table 4. Average spread, pod counts, and collection locations of eleven Florida Mimosa accessions with superior pod production identified during testing in 2012 and 2013 at three locations in Florida. Planting locations were the USDA, NRCS Brooksville Plant Materials Center, the UF/IFAS Ona Range Cattle Research and Education Center, and the UF/IFAS Quincy North Florida Research and Education Center.

Accession	Brooksville		Ona		Quincy		County	GPS Coordinates
	Average Spread ¹ (no. sq dm)	Average Pods ²	Average Spread ³ (no. sq dm)	Average Pods ⁴	Average Spread ⁵ (no. sq dm)	Average Pods ⁶		
9060726	4	8	15	6	16	40	Seminole	N 28° 44' 5", W 81° 14' 7"
9060740	14	19	23	22	24	15	Hernando	N 28° 30' 3", W 82° 8' 3"
9060744	20	6	14	15	38	74	Madison	N 30° 26' 8", W 83° 31' 31"
9060815	22	22	32	7	53	38	St. Lucie	N 27° 24' 23", W 80° 18' 25"
9060816	12	17	25	22	37	33	St. Lucie	N 27° 26' 49", W 80° 19' 47"
9060825	19	11	5	14	22	33	Gilchrist	N 29° 38' 58", W 82° 50' 17"
9060827	49	9	20	21	49	24	Lafayette	N 29° 57' 2", W 82° 57' 6"
9060830	40	17	42	4	38	149	Madison	N 30° 29' 7", W 83° 27' 20"
9060831	42	1	27	17	25	34	Madison	N 30° 28' 8", W 83° 23' 19"
9060837	57	19	15	0	53	34	St. Johns	N 29° 47' 20", W 81° 19' 5"
9060838	10	32	15	10	23	25	Alachua	N 29° 48' 2", W 82° 30' 29"

¹ Plant spread at Brooksville was determined using a one square meter frame with strings attached every ten centimeters, dividing the frame into 100 square decimeters (dm) on 17 Sep 2012. The frame was placed over the plots and the number of squares that contained a portion of a mimosa plant were counted. Values presented are the average counts for each accession from three replications. Note: this was not the total spread of each plant because many grew beyond the edges of the meter frame.

² Number of pods inside a one-meter square frame were counted at Brooksville on 4 Jun 2013 and 25 Jul 2013 and the counts from the two dates were added together to determine a total number of pods produced; values presented are the average of total pod numbers from three replications.

³ Plant spread at Ona was measured as described above on 23 Aug 2012.

⁴ Pods at Ona were counted on 13 Jun 2013 and 11 Jul 2013 as described above.

⁵ Plant spread at Quincy was measured as described above on 11 Sep 2012.

⁶ Pods at Quincy were counted on 11 Jun 2013 and 17 Jul 2013 as described above.

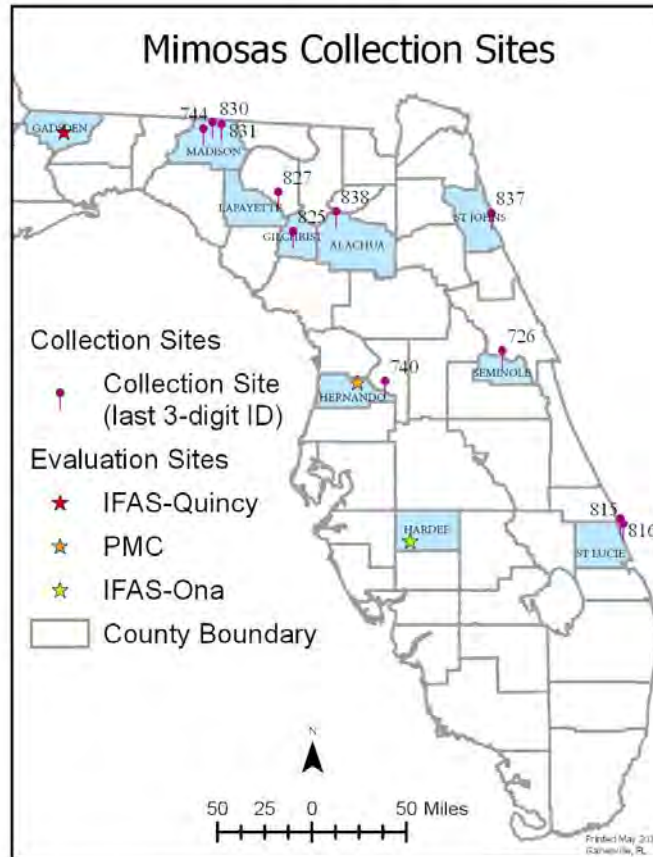


Figure 3. Map of Florida showing the collection locations of the superior accessions listed in Table 4 and the location of the evaluation sites.

APPENDIX A

Table 5. Spread, flowering and fruiting data, and general observations for 69 powderpuff accessions planted at the USDA, NRCS Brooksville Plant Materials Center, Brooksville, FL.

Accession	Rep	Plot	9/17/2012	6/4/2013		7/25/2013		Total Flowers ²	Total Pods ³	Comments:
			Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³			
421895	1	101	28	1	0	0	0	1	0	Tall dark green
421895	2	214	4	7	0	1	0	8	0	Med
421895	3	341	59	6	2	0	1	6	3	Low
9028136	1	102	33	0	0	0		0	0	Med
9028136	2	248	26	3	0	0	5	3	5	Med
9028136	3	367	25	2	0	2	0	4	0	Low
9060702	1	103	0	0	0	0	0	0	0	Med
9060702	2	269	10	7	0	0	0	7	0	Low
9060702	3	334	60	2	0	2	0	4	0	Tall
9060723	1	104	0	0	0	0	0	0	0	Tall
9060723	2	259	0	0	0	9	0	9	0	Low bloom med to tall
9060723	3	347	0							Dead
9060724	1	105	0							Dead
9060724	2	256	48	9	7	0	0	9	7	Med
9060724	3	354	68	1	0	0	0	1	0	Tall
9060725	1	106	0							Dead
9060725	2	236	95	57	0	40	58	97	58	Low very low to ground dark green
9060725	3	322	7	0	0	2	1	2	1	Tall
9060726	1	107	0	0	0	0	5	0	5	Med
9060726	2	230	1	10	0	0	18	10	18	Low
9060726	3	348	11	0	0	0	0	0	0	Low
9060727	1	108	0							Dead
9060727	2	240	53	1	0	3	8	4	8	Low
9060727	3	363	25	0	0	0	0	0	0	Low
9060728	1	109	16	5	0	0	0	5	0	Tall

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060728	2	261	22	2	0	0	2	2	2	Med
9060728	3	343	4	0	0	0	0	0	0	Med
9060729	1	110	4	12	0	2	9	14	9	Med
9060729	2	262	42	0	0	0	3	0	3	Low dark green
9060729	3	350	39	2	0	0	0	2	0	Med
9060730	1	111	4	0	0	0	0	0	0	Low
9060730	2	244	25	1	0	0	0	1	0	Low
9060730	3	349	44	11	2	0	0	11	2	Low
9060731	1	112	4	3	0	0	1	3	1	Low
9060731	2	268	47	2	0	0	1	2	1	Med dark green
9060731	3	329	25	0	0	0	0	0	0	Low
9060732	1	113	0	0	0	1	0	1	0	Low
9060732	2	217	29	3	0	2	0	5	0	Low seed pod tall
9060732	3	304	43	11	0	0	3	11	3	Med
9060733	1	114	0	1	0	0	0	1	0	Low
9060733	2	265	59	5	0	1	7	6	7	Med
9060733	3	326	52	7	1	0	1	7	2	Tall
9060734	1	115	40	3	5	0	2	3	7	Tall dark green
9060734	2	225	26	3	0	0	14	3	14	Low
9060734	3	312	11	1	0	0	0	1	0	Low
9060735	1	116	19	6	0	0	0	6	0	Med
9060735	2	213	0	1	1	0	3	1	4	Med
9060735	3	328	25	6	3	0	4	6	7	Low
9060736	1	117	11	0	0	0	0	0	0	Med
9060736	2	219	2	2	0	0	0	2	0	Low
9060736	3	323	8							Dead
9060737	1	118	0	2	0	0	0	2	0	Dead
9060737	2	255	0							Dead
9060737	3	365	0							Dead

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060739	1	119	13	3	0	0	0	3	0	Low
9060739	2	237	55	9	0	1	14	10	14	Low dark green
9060739	3	369	87	0	0	1	3	1	3	Med
9060740	1	120	0							Dead
9060740	2	251	42	6	2	0	17	6	19	Med
9060740	3	339	0		0					Dead
9060741	1	121	2	0	0	1	0	1	0	Low small leaf
9060741	2	221	46	9	0	1	2	10	2	Low
9060741	3	337	53	0	9	2	0	2	0	Low very low to ground dark green
9060743	1	122	0							Dead
9060743	2	207	0	7	0	2	2	9	2	Tall
9060743	3	307	48	10	2	5	7	15	9	Low dark green
9060744	1	123	29	13	0	0	0	13	0	Med
9060744	2	257	32	6	3	1	8	7	11	Tall seed pod tall
9060744	3	313	0							Dead
9060745	1	124	11	8	0	0	0	8	0	Tall
9060745	2	232	39	5	2	0	1	5	3	Tall
9060745	3	358	67	5	0	0	0	5	0	Tall
9060746	1	125	0							Dead
9060746	2	242	18	10	1	1	2	11	3	Low dark green
9060746	3	364	11	0	0	0	0	0	0	Med
9060809	1	126	11	4	0	0	0	4	0	Med to Low
9060809	2	245	56	6	0	0	2	6	2	Low
9060809	3	324	53	2	0	1	5	3	5	Med
9060810	1	127	4	0	0	0	0	0	0	Med
9060810	2	233	4	0	0	0	7	0	7	Tall
9060810	3	345	12	7	0	1	5	8	5	Med
9060811	1	128	4	0	0	0	0	0	0	Tall
9060811	2	235	8	1	0	0	0	1	0	Tall

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060811	3	333	21	3	0	9	0	12	0	Med to tall
9060812	1	129	29	4	0	0	0	4	0	Med
9060812	2	250	60	26	0	0	0	26	0	Tall
9060812	3	319	67	0	0	0	0	0	0	Low
9060813	1	130	0							Dead
9060813	2	239	52	2	0	1	0	3	0	Low
9060813	3	352	86	0	0	1	5	1	5	Low dark green
9060814	1	131	4	3	0	0	0	3	0	Low dark green
9060814	2	205	24	36	0	0	1	36	1	Low dark green
9060814	3	342	2	5	4	1	0	6	4	Med
9060815	1	132	11	13	0	0	0	13	0	Low
9060815	2	229	6	32	1	0	14	32	15	Low dark green
9060815	3	301	50	31	0	38	52	69	52	Low very low to ground dark green
9060816	1	133	0	7	4	0	0	7	4	Low small leaf dark green
9060816	2	208	36	26	11	0	33	26	44	Low dark green
9060816	3	332	1	9	4	0	0	9	4	Med
9060817	1	134	37	2	0	1	0	3	0	Med
9060817	2	247	28	0	0	0	0	0	0	Low
9060817	3	327	100	0	0	0	7	0	7	Low
9060818	1	135	3	1	0	0	0	1	0	Low
9060818	2	258	0	0	0	0	0	0	0	Low
9060818	3	336	69	9	0	3	4	12	4	Med
9060819	1	136	0	3	0	1	0	4	0	Med
9060819	2	243	0	11	0	3	10	14	10	Low
9060819	3	325	17	7	0	1	4	8	4	Med
9060820	1	137	40	1	0	1	0	2	0	Med
9060820	2	204	95	4	0	0	1	4	1	Low
9060820	3	330	13	3	0	0	0	3	0	Tall
9060821	1	138	37	0	0	0	0	0	0	Med

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060821	2	234	1	10	1	0	0	10	1	Tall
9060821	3	360	51	7	3	0	4	7	7	Low
9060823	1	139	24	2	0	0	0	2	0	Med
9060823	2	224	0	0	0	0	0	0	0	Low
9060823	3	368	40	3	0	0	0	3	0	Med
9060824	1	140	35	31	18	5	58	36	76	Low dark green small leaf
9060824	2	203	10	3	0	3	5	6	5	Low very low to ground- seed pod tall
9060824	3	338	17	0	0	0	0	0	0	Low
9060825	1	141	23	3	0	14	7	17	7	Low
9060825	2	212	6	4	25	0	0	4	25	Tall
9060825	3	362	29	0	0	0	0	0	0	Med
9060826	1	142	21	7	0	3	1	10	1	Low dark green
9060826	2	266	4	0	0	0	0	0	0	Med
9060826	3	311	53	14	0	13	17	27	17	Low
9060827	1	143	6	1	8	1	0	2	8	Low
9060827	2	246	85	17	7	3	5	20	12	Low
9060827	3	305	56	2	4	3	3	5	7	Low
9060828	1	144	25	6	3	5	2	11	5	Med dark green
9060828	2	201	46	6	0	11	10	17	10	Low very low to ground
9060828	3	331	6	1	0	0	0	1	0	Tall
9060830	1	145	53	20	8	0	0	20	8	Med
9060830	2	209	56	21	7	6	18	27	25	Tall
9060830	3	346	10	9	12	4	6	13	18	Low dark green
9060831	1	146	48	14	4	0	0	14	4	Med
9060831	2	231	4	2	0	0	0	2	0	Med
9060831	3	355	74	2	0	3	0	5	0	Med
9060832	1	147	45	24	0	5	8	29	8	Low spreading
9060832	2	218	6	11	0	0	0	11	0	Low
9060832	3	356	68	9	2	0	0	9	2	Tall

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060833	1	148	16	7	1	0	0	7	1	Low
9060833	2	211	27	9	1	0	0	9	1	Tall
9060833	3	359	65	4	0	0	6	4	6	Med
9060834	1	149	17	0	0	2	0	2	0	Med
9060834	2	228	0							Dead
9060834	3	302	59	7	0	3	0	10	0	Low
9060835	1	150	49	0	0	0	0	0	0	Low
9060835	2	264	18	2	0	0	6	2	6	Med
9060835	3	315	22	0	0	0	0	0	0	Low
9060836	1	151	20	9	11	0	7	9	18	Med
9060836	2	223	40	6	0	0	2	6	2	Med
9060836	3	317	43	2	3	9	9	11	12	Low dark green
9060837	1	152	21	8	0	1	6	9	6	Low
9060837	2	238	75	19	0	7	31	26	31	Low small
9060837	3	306	74	17	0	23	21	40	21	Med to low
9060838	1	153	2	4	1	1	1	5	2	Med
9060838	2	241	4	31	27	3	43	34	70	Low dark green
9060838	3	321	25	6	6	3	18	9	24	Med
9060839	1	154	0							Dead
9060839	2	263	43	4	0	0	8	4	8	Tall
9060839	3	310	44	7	3	0	6	7	9	Low
9060840	1	155	12	0	0	0	0	0	0	Med
9060840	2	226	50	0	4	0	0	0	4	Tall
9060840	3	314	38	0	5	0	0	0	5	Low dark green
9060841	1	156	0							Dead
9060841	2	222	0	3	2	0	0	3	2	Low
9060841	3	318	0							Dead
9060861	1	157	0	2	0	0	0	2	0	Tall
9060861	2	267	41	0	0	1	0	1	0	Med

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060861	3	316	13	0	0	5	0	5	0	Med
9060862	1	158	14	11	0	0	0	11	0	Med
9060862	2	202	16	5	3	5	15	10	18	Low very low to ground
9060862	3	357	0	7	0	3	1	10	1	Med
9060871	1	159	0							Dead
9060871	2	252	16	11	2	0	2	11	4	Low
9060871	3	353	67	1	0	3	3	4	3	Low
9060872	1	160	24	1	5	0	0	1	5	Tall
9060872	2	206	68	3	3	1	7	4	10	Tall seed pod tall
9060872	3	320	38	3	4	0	3	3	7	Low
9060873	1	161	10	4	1	0	0	4	1	Med
9060873	2	216	18	1	0	0	0	1	0	Tall very
9060873	3	361	27	3	0	1	0	4	0	Low
9060874	1	162	23	7	3	0	0	7	3	Med
9060874	2	215	11	3	14	3	0	6	14	Low
9060874	3	344	32	5	0	0	2	5	2	Med
9060875	1	163	0							Dead
9060875	2	254	2	3	0	0	0	3	0	Med
9060875	3	366	31	0	0	0	3	0	3	Tall
9060876	1	164	0							Dead
9060876	2	220	2							Dead
9060876	3	340	38	3	0	0	0	3	0	Low
9060877	1	165	9	5	0	0	0	5	0	Tall
9060877	2	249	0	2	0	0	5	2	5	Med
9060877	3	309	0	7	7	0	0	7	7	Low
9060878	1	166	23	3	0	0	0	3	0	Tall
9060878	2	210	48	6	0	1	4	7	4	Tall
9060878	3	308	32	15	0	2	17	17	17	Med
9060879	1	167	4	3	0	0	0	3	0	Tall

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060879	2	253	2	5	0	0	23	5	23	Low
9060879	3	335	7	3	0	1	0	4	0	Tall
9060880	1	168	4	1	0	0	0	1	0	Med
9060880	2	227	17	6	1	1	11	7	12	Tall
9060880	3	303	4	4	0	2	0	6	0	Low
9060881	1	169	4	3	0	2	0	5	0	Med
9060881	2	260	48	3	0	0	1	3	1	Low
9060881	3	351	81	3	0	2	9	5	9	Med dark green

¹ Plant spread was determined using a one square meter frame with strings attached every ten centimeters, dividing the frame into 100 square decimeters (dm). The frame was placed over the plots and the number of squares that contained a portion of a powderpuff plant were counted. Note: this was not the total spread of each plant because many grew beyond the edges of the meter frame.

² No. Flowers refers to the number of circular flower clusters counted within the one square meter frame described above, not to the number of individual flowers.

³ The number of pods counted within the one square meter frame described above.

Table 6. Spread, flowering and fruiting data, and general observations for 69 powderpuff accessions planted at the University of Florida, Institute of Food and Agricultural Sciences, Ona Range Cattle Research and Education Center, Ona, FL.

			8/23/2012	6/13/2013		7/11/2013				
Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
421895	1	101	28	0	0	0	0	0	0	Med
421895	2	225	7	0	0	0	0	0	0	Low
421895	3	305	17	0	0	0	0	0	0	Tall
9028136	1	102	17	0	0	0	0	0	0	Med
9028136	2	254	48	1	0	0	0	1	0	Med
9028136	3	332	21	0	1	0	0	0	1	Med
9060702	1	103	27	0	0	0	0	0	0	Med
9060702	2	207	14	0	0	0	0	0	0	Med
9060702	3	362	42	0	0	0	0	0	0	Med dark green
9060723	1	104	0							Dead
9060723	2	237	6	0	0	0	0	0	0	Med
9060723	3	363	11	1	0	0	0	1	0	Tall
9060724	1	105	0							Dead
9060724	2	217	0	0	0	0	0	0	0	Med
9060724	3	337	7	0	0	0	0	0	0	Med dark green
9060725	1	106	10	0	0	0	0	0	0	Low
9060725	2	269	0	0	0	0	0	0	0	Med
9060725	3	321	5	0	0	0	0	0	0	Low dark green
9060726	1	107	0							Dead
9060726	2	204	24	3	9	0	1	3	10	Low to ground
9060726	3	327	21	2	2	0	0	2	2	Med
9060727	1	108	14	0	0	0	0	0	0	Low
9060727	2	222	18	4	0	0	0	4	0	Tall
9060727	3	320	21	0	0	0	0	0	0	Med
9060728	1	109	16	0	0	0	0	0	0	Med
9060728	2	239	0							Dead
9060728	3	304	9	0	0	0	0	0	0	Med

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060729	1	110	15	1	14	0	0	1	14	Med
9060729	2	218	28	0	0	0	0	0	0	Med
9060729	3	367	9	1	11	0	0	1	11	Med
9060730	1	111	0							Dead
9060730	2	251	0	0	0	0	0	0	0	Low
9060730	3	353	0	0	0	0	0	0	0	Low
9060731	1	112	28	5	13	0	2	5	15	Tall seed head tall
9060731	2	215	17	1	5	0	0	1	5	Med
9060731	3	357	20	2	0	0	0	2	0	Med
9060732	1	113	0	0	0	0	0	0	0	Med
9060732	2	228	11	1	0	0	0	1	0	Med
9060732	3	314	30	0	0	0	0	0	0	Med
9060733	1	114	8	1	0	0	0	1	0	Med
9060733	2	264	33	1	0	0	0	1	0	Low
9060733	3	309	27	2	3	0	0	2	3	Tall
9060734	1	115	8	0	0	0	0	0	0	Low
9060734	2	213	11	1	0	0	0	1	0	Tall
9060734	3	319	33	2	5	0	0	2	5	Med
9060735	1	116	40	10	36	0	0	10	36	Low
9060735	2	214	50	3	13	0	0	3	13	Med
9060735	3	355	28	0	0	0	0	0	0	Med
9060736	1	117	22	0	0	0	0	0	0	Low
9060736	2	253	13	0	0	0	0	0	0	Med
9060736	3	302	4	0	0	0	0	0	0	Med
9060737	1	118	18	2	0	0	0	2	0	Med
9060737	2	243	22	0	0	0	0	0	0	Med large leaf
9060737	3	356	15	0	0	0	0	0	0	Tall
9060739	1	119	48	3	0	0	3	3	3	Tall seed head tall
9060739	2	246	41	0	0	0	0	0	0	Med dark green

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060739	3	313	59	0	0	0	0	0	0	Med
9060740	1	120	16	10	21	0	1	10	22	Med
9060740	2	236	35	7	14	0	29	7	43	Med uniform still ripening
9060740	3	336	18	0	0	0	0	0	0	Med
9060741	1	121	99	6	17	0	15	6	32	Low seed head low
9060741	2	208	16	0	2	0	0	0	2	Med
9060741	3	347	26	0	0	0	0	0	0	Med dark green
9060743	1	122	13	3	3	0	0	3	3	Low seed head low
9060743	2	267	25	5	9	0	4	5	13	Med plant low seed head
9060743	3	350	21	3	7	0	0	3	7	Med
9060744	1	123	29	2	3	0	1	2	4	Tall seed head tall
9060744	2	227	0							Dead
9060744	3	343	14	3	22	0	3	3	25	Med
9060745	1	124	23	1	2	0	2	1	4	Tall seed head tall
9060745	2	255	69	3	10	0	0	3	10	Tall
9060745	3	330	16	1	0	0	0	1	0	Med
9060746	1	125	41	0	1	0	0	0	1	Med
9060746	2	220	50	0	2	0	0	0	2	Med
9060746	3	342	34	0	0	0	0	0	0	Low
9060809	1	126	58	3	13	0	0	3	13	Med
9060809	2	230	24	2	0	0	0	2	0	Low
9060809	3	311	21	2	0	0	0	2	0	Low
9060810	1	127	6	1	0	0	0	1	0	Low growing
9060810	2	210	17	1	1	0	0	1	1	Low
9060810	3	366	10	1	0	0	0	1	0	Med
9060811	1	128	29	3	0	0	0	3	0	Low
9060811	2	231	44	0	0	0	0	0	0	Med
9060811	3	331	25	0	0	0	0	0	0	Med
9060812	1	129	30	1	0	0	0	1	0	Med

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060812	2	238	0							Dead
9060812	3	328	63	11	0	0	0	11	0	Low
9060813	1	130	15	0	0	0	0	0	0	Low
9060813	2	247	8	1	7	0	0	1	7	Low dark green
9060813	3	323	0							Dead
9060814	1	131	25	7	15	0	0	7	15	Low growing dark green small leaf
9060814	2	203	0	0	0	0	0	0	0	Med
9060814	3	333	20	1	0	0	0	1	0	Med dark green
9060815	1	132	42	6	17	0	0	6	17	Low growing dark green small leaf
9060815	2	242	28	4	4	0	0	4	4	Low dark green
9060815	3	317	27	0	1	0	0	0	1	Med dark green
9060816	1	133	14	6	16	0	0	6	16	Low growing dark green small leaf
9060816	2	256	23	7	12	0	0	7	12	Tall
9060816	3	351	37	12	27	0	12	12	39	Low compact dark green
9060817	1	134	47	3	12	0	0	3	12	Low growing dark green small leaf
9060817	2	206	29	3	7	0	0	3	7	Med
9060817	3	301	55	1	0	0	0	1	0	Med
9060818	1	135	14							Dead
9060818	2	250	24	2	0	0	0	2	0	Med
9060818	3	312	35	3	0	0	0	3	0	Low
9060819	1	136	13	3	0	0	0	3	0	Tall
9060819	2	235	8	0	0	0	0	0	0	Low
9060819	3	365	37	1	0	0	0	1	0	Low
9060820	1	137	3	1	0	0	0	1	0	Med
9060820	2	232	9	0	0	0	0	0	0	Med
9060820	3	354	2	2	0	0	0	2	0	Med
9060821	1	138	32	3	7	0	1	3	8	Med
9060821	2	244	20	3	0	0	0	3	0	Med
9060821	3	338	6	1	5	0	0	1	5	Med

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060823	1	139	14	2	8			2	8	Dead
9060823	2	249	0	0	0	0	0	0	0	Tall
9060823	3	345	23	1	5	0	0	1	5	Med
9060824	1	140	3	0	0	0	0	0	0	Med
9060824	2	226	0							Dead
9060824	3	364	0							Dead
9060825	1	141	5	2	0	0	0	2	0	Tall
9060825	2	212	0	0	0	0	0	0	0	Tall
9060825	3	352	11	2	36	0	5	2	41	Med dark green
9060826	1	142	28	0	0	0	0	0	0	Med
9060826	2	268	42	6	7	0	0	6	7	Med
9060826	3	369	3	0	0	0	0	0	0	Med
9060827	1	143	7							Dead
9060827	2	258	40	4	36	0	0	4	36	Med compact
9060827	3	334	13	1	5	0	0	1	5	Low very small
9060828	1	144	7							Dead
9060828	2	265	19	1	0	0	0	1	0	Med dark green
9060828	3	318	0							Dead
9060830	1	145	33	0	1	0	0	0	1	Low
9060830	2	259	66	4	11	0	0	4	11	Med
9060830	3	341	27	0	0	0	0	0	0	Low
9060831	1	146	17	1	4	2	1	3	5	Tall
9060831	2	224	64	7	45	0	0	7	45	Med
9060831	3	360	0	0	0	0	0	0	0	Tall
9060832	1	147	60	6	0	0	0	6	0	
9060832	2	248	46	5	10	0	0	5	10	Med
9060832	3	361	2	2	0	0	0	2	0	Tall
9060833	1	148	39	8	8	1	0	9	8	Tall seed pods tall
9060833	2	233	0							Dead

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060833	3	324	0							Dead
9060834	1	149	0							Dead
9060834	2	260	0	0	0	0	0	0	0	Med
9060834	3	348	0							Dead
9060835	1	150	3	0	0	0	0	0	0	Low
9060835	2	234	23	0	0	0	0	0	0	Low small leaf
9060835	3	349	50	0	0	0	0	0	0	Low compact
9060836	1	151	28	0	11	0	0	0	11	Tall plant
9060836	2	263	42	5	1	0	6	5	7	Med plant tall seed head
9060836	3	316	16	2	18	0	0	2	18	Tall big leaf
9060837	1	152	2	0	0	0	0	0	0	Med
9060837	2	261	43	0	0	0	0	0	0	Tall
9060837	3	359	0	1	0	0	0	1	0	Low
9060838	1	153	16	2	8	0	0	2	8	Med
9060838	2	262	21	2	7	0	0	2	7	Tall
9060838	3	340	8	1	16	0	0	1	16	Med
9060839	1	154	16	0	0	0	0	0	0	Med
9060839	2	201	17	2	0	0	0	2	0	Tall
9060839	3	303	0							Dead
9060840	1	155	19	0	0	0	0	0	0	Med
9060840	2	216	42	0	3	0	0	0	3	Med
9060840	3	326	11	4	1	0	0	4	1	Med
9060841	1	156	0							Dead
9060841	2	257	4							Dead
9060841	3	329	0	0	0	0	0	0	0	Low
9060861	1	157	27	0	0	0	0	0	0	Low
9060861	2	229	30	3	0	0	0	3	0	Med
9060861	3	358	27	0	0	0	0	0	0	Low
9060862	1	158	6	1	1	0	0	1	1	Low

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060862	2	252	46	2	0	0	0	2	0	Low compact
9060862	3	346	24	0	0	0	0	0	0	Low
9060871	1	159	8	4	7	0	0	4	7	Med
9060871	2	209	0							Dead
9060871	3	307	15	1	0	0	0	1	0	Tall
9060872	1	160	0							Dead
9060872	2	245	15	0	0	0	0	0	0	Tall
9060872	3	310	38	2	3	0	0	2	3	Med
9060873	1	161	0							Dead
9060873	2	266	27	1	0	0	0	1	0	Med
9060873	3	335	7	1	7	0	0	1	7	Tall
9060874	1	162	11	0	3	0	0	0	3	Med
9060874	2	211	29	2	6	0	0	2	6	Med
9060874	3	325	34	1	1	0	0	1	1	Med dark green
9060875	1	163	0							Dead
9060875	2	223	2	0	8	0	0	0	8	Med
9060875	3	315	17	2	0	0	0	2	0	Tall
9060876	1	164	0	0	0	0	0	0	0	Low
9060876	2	205	0							Dead
9060876	3	322	14	0	0	0	0	0	0	Med
9060877	1	165	8	2	0	0	0	2	0	Med
9060877	2	221	16	4	7	0	0	4	7	Med
9060877	3	339	7	0	0	0	0	0	0	Tall
9060878	1	166	4	0	0	1	0	1	0	Tall seed heads tall
9060878	2	202	20	2	1	0	0	2	1	Med
9060878	3	308	27	3	11	0	0	3	11	Med
9060879	1	167	0							Dead
9060879	2	241	5	0	0	0	0	0	0	Med
9060879	3	344	44	11	32	0	4	11	36	Med uniform ripening

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060880	1	168	0							Dead
9060880	2	219	23	2	2	0	0	2	2	Med
9060880	3	306	1	2	0	0	2	2	2	Med
9060881	1	169	4	0	0	0	0	0	0	Low
9060881	2	240	19	0	0	0	0	0	0	Tall
9060881	3	368	33	1	3	0	0	1	3	Low dark green

¹ Plant spread was determined using a one square meter frame with strings attached every ten centimeters, dividing the frame into 100 square decimeters (dm). The frame was placed over the plots and the number of squares that contained a portion of a powderpuff plant were counted. Note: this was not the total spread of each plant because many grew beyond the edges of the meter frame.

² No. Flowers refers to the number of circular flower clusters counted within the one square meter frame described above, not to the number of individual flowers.

³ The number of pods counted within the one square meter frame described above.

Table 7. Spread, flowering and fruiting data, and general observations for 69 powderpuff accessions planted at the University of Florida, Institute of Food and Agricultural Sciences, Quincy North Florida Research and Education Center, Quincy, FL.

Accession	Rep	Plot	9/11/2012	6/11/2013		7/17/2013		Total Flowers ²	Total Pods ³	Comments:
			Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³			
421895	1	101	2	1	0	0	4	1	4	Tall
421895	2	220	34	11	37	5	6	16	43	Low plant low seedheads
421895	3	355	72	2	17	1	10	3	27	Med green
9028136	1	102	24	2	0	3	2	5	2	Tall
9028136	2	210	49	0	0	0	1	0	1	Med
9028136	3	368	72	0	0	0	22	0	22	Med
9060702	1	103	27	3	3	0	10	3	13	Med
9060702	2	221	27	2	0	0	0	2	0	Low
9060702	3	350	57	3	0	0	5	3	5	Low
9060723	1	104	0							Dead
9060723	2	258	0	0	0	0	0	0	0	
9060723	3	352	0							Dead
9060724	1	105	37	1	0	0	2	1	2	Tall
9060724	2	249	17	0	2	0	4	0	6	Med
9060724	3	308	13	0	0	0	0	0	0	
9060725	1	106	21	3	11	1	3	4	14	Med
9060725	2	232	16	0	6	0	0	0	6	Low
9060725	3	301	16	0	4	0	5	0	9	Med green
9060726	1	107	14	3	7	0	19	3	26	Tall- very
9060726	2	240	17	17	31	0	32	17	63	Med uniform
9060726	3	305	17	8	30	5	0	13	30	Med-Tall spent bloom
9060727	1	108	13	1	0	0	0	1	0	
9060727	2	245	4	0	0	0	0	0	0	
9060727	3	323	70	5	0	0	2	5	2	Low
9060728	1	109	23	0	2	0	1	0	3	Tall shattered
9060728	2	208	3	0	0	0	0	0	0	
9060728	3	311	19	0	0	0	0	0	0	

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060729	1	110	52	3	0	1	0	4	0	Tall
9060729	2	222	52	7	17	0	10	7	27	Med
9060729	3	338	15	0	0	0	0	0	0	
9060730	1	111	0							Dead
9060730	2	268	19	1	0	0	0	1	0	
9060730	3	325	26	3	0	0	5	3	5	Med green pods
9060731	1	112	15	2	3	1	0	3	3	Med
9060731	2	236	63	7	10	1	0	8	10	
9060731	3	335	8	1	9	0	0	1	9	
9060732	1	113	22	11	0	1	0	12	0	Tall
9060732	2	254	13	3	0	0	0	3	0	
9060732	3	332	18	3	0	0	0	3	0	
9060733	1	114	5	1	0	0	0	1	0	
9060733	2	257	33	0	4	1	0	1	4	Low
9060733	3	331	0	0		0	8	0	8	Dead Low
9060734	1	115	0	0	0	0	0	0	0	
9060734	2	269	5	3	0	2	0	5	0	
9060734	3	339	0							Dead
9060735	1	116	21	0	0	0	0	0	0	Low
9060735	2	225	47	10	16	0	14	10	30	Med
9060735	3	357	31	0	0	0	1	0	1	Med
9060736	1	117	0	0	0	0	0	0	0	
9060736	2	238	23	1	1	0	3	1	4	Med
9060736	3	329	12	1	3	0	5	1	8	Med shattered
9060737	1	118	21	3	0	0	0	3	0	
9060737	2	205	28	5	0	0	4	5	4	Med
9060737	3	337	0							Dead
9060739	1	119	19	0	0	0	0	0	0	Tall

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060739	2	219	33	0	29	0	18	0	47	Tall-green brown uniform
9060739	3	316	19	3	3	0	0	3	3	
9060740	1	120	11	0	0	0	10	0	10	Low
9060740	2	202	0	7	0	0	11	7	11	Med
9060740	3	306	62	5	11	2	12	7	23	Med uniform
9060741	1	121	47	3	4	0	0	3	4	Low
9060741	2	261	0	3	10	0	0	3	10	
9060741	3	346	39	1	21	0	7	1	28	Med
9060743	1	122	19	3	0	0	0	3	0	
9060743	2	233	7	12	2	6	6	18	8	Low
9060743	3	356	8	0	0	0	0	0	0	
9060744	1	123	31	13	0	0	29	13	29	Tall
9060744	2	250	27	1	0	0	0	1	0	
9060744	3	340	57	21	125	0	67	21	192	Med holding well
9060745	1	124	17	2	0	0	0	2	0	
9060745	2	226	3	0	0	0	0	0	0	
9060745	3	354	6	0	0	0	0	0	0	
9060746	1	125	5	0	0	0	0	0	0	Tall
9060746	2	243	4	0	0	0	2	0	2	Med
9060746	3	359	0							Dead
9060809	1	126	31	2	0	0	0	2	0	Low
9060809	2	230	37	0	0	0	0	0	0	
9060809	3	362	18	0	0	0	0	0	0	
9060810	1	127	9	0	0	0	0	0	0	
9060810	2	263	0							Dead
9060810	3	347	8	0	0	0	0	0	0	
9060811	1	128	10							Dead
9060811	2	244	17	5	0	2	0	7	0	Med
9060811	3	333	23	1	0	0	0	1	0	

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060812	1	129	65	3	0	0	0	3	0	
9060812	2	231	37	1	0	0	4	1	4	Med
9060812	3	341	35	0	0	0	0	0	0	
9060813	1	130	32	2	0	1	0	3	0	Low
9060813	2	246	2	0	0	0	0	0	0	
9060813	3	318	2							Dead
9060814	1	131	37	11	1	0	0	11	1	Low - very
9060814	2	224	49	13	37	6	15	19	52	Low very many uniform
9060814	3	310	25	0	0	0	0	0	0	
9060815	1	132	65	15	5	1	27	16	32	uniform ripening
9060815	2	204	74	13	18	2	32	15	50	Med-uniform
9060815	3	369	21	13	11	3	22	16	33	Med
9060816	1	133	19	5	2	0	0	5	2	
9060816	2	211	32	23	67	1	0	24	67	Med
9060816	3	304	59	7	21	6	9	13	30	Low 1 bloom still pink
9060817	1	134	11	7	2	0	0	7	2	Low
9060817	2	229	31	3	1	0	3	3	4	Med
9060817	3	343	3	11	7	0	0	11	7	
9060818	1	135	21	1	0	0	0	1	0	Low
9060818	2	265	2	3	0	0	1	3	1	Med
9060818	3	336	27	0	0	0	0	0	0	robust growth
9060819	1	136	23	0	0	0	0	0	0	
9060819	2	239	39	1	29	0	21	1	50	Med uniform
9060819	3	351	28	27	17	0	14	27	31	green pods
9060820	1	137	13	0	0	0	0	0	0	Low
9060820	2	260	7	7	0	0	3	7	3	Med
9060820	3	353	2	2	0	0	0	2	0	
9060821	1	138	5	0	0	1	0	1	0	Med
9060821	2	218	20	7	13	1	5	8	18	Tall

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060821	3	302	26	11	37	17	0	28	37	spent flowers
9060823	1	139	39	3	0	0	6	3	6	Med-robust
9060823	2	213	38	3	4	0	5	3	9	Tall
9060823	3	365	74	11	47	0	24	11	71	Tall
9060824	1	140	46	0	14	1	0	1	14	Low
9060824	2	227	27	3	11	0	0	3	11	Low plant poor growth
9060824	3	313	7	2	0	0	0	2	0	
9060825	1	141	21	2	5	2	6	4	11	Med
9060825	2	235	7	0	0	0	0	0	0	
9060825	3	342	38	2	46	0	41	2	87	Med good seeder
9060826	1	142	57	0	10	0	4	0	14	Med- robust
9060826	2	216	13	3	0	0	5	3	5	Med
9060826	3	334	1	7	5	1	0	8	5	Tall still blooming
9060827	1	143	66	7	9	0	3	7	12	Low
9060827	2	259	48	3	4	0	26	3	30	Low
9060827	3	330	34	13	21	1	10	14	31	Low shattered
9060828	1	144	24	0	0	0	0	0	0	
9060828	2	251	21	0	0	0	0	0	0	
9060828	3	327	21	0	0	0	0	0	0	
9060830	1	145	34	6	17	0	4	6	21	Med
9060830	2	214	19	5	117	0	100	5	217	Med some shattered and mashed to ground
9060830	3	366	61	23	143	0	65	23	208	Med holding seed spread outside
9060831	1	146	23	2	0	0	5	2	5	Med
9060831	2	234	19	7	11	0	16	7	27	Med
9060831	3	345	33	17	29	0	42	17	71	Tall
9060832	1	147	0							Dead
9060832	2	237	20	21	1	6	18	27	19	Med Shattered
9060832	3	319	38	37	17	0	1	37	18	Med shattered
9060833	1	148	9							Dead

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060833	2	267	10	7	0	0	22	7	22	Tall
9060833	3	317	15	7	0	0	5	7	5	Med green
9060834	1	149	11	0	0	0	0	0	0	Low
9060834	2	252	0							Dead
9060834	3	312	1							Dead
9060835	1	150	39	2	0	0	0	2	0	
9060835	2	217	11	0	0	0	0	0	0	
9060835	3	367	12	0	0	0	0	0	0	
9060836	1	151	28	7	0	2	6	9	6	Med
9060836	2	242	23	1	5	0	0	1	5	
9060836	3	321	19	6	12	0	0	6	12	
9060837	1	152	56	23	7	0	46	23	53	Med uniform
9060837	2	264	91	10	1	0	17	10	18	Low
9060837	3	348	13	7	9	0	23	7	32	Tall
9060838	1	153	7	2	25	0	4	2	29	Low
9060838	2	212	17	6	20	0	6	6	26	spent seed heads
9060838	3	307	45	11	17	0	2	11	19	Low
9060839	1	154	23	0	0	1	0	1	0	Med
9060839	2	248	8	0	0	0	0	0	0	
9060839	3	309	0							Dead
9060840	1	155	17	0	0	0	0	0	0	Low
9060840	2	255	0	0	0	0	0	0	0	poor growth
9060840	3	320	0							Dead
9060841	1	156	4	0	0	0	0	0	0	Low
9060841	2	207	17	0	0	0	0	0	0	
9060841	3	314	8	0	0	0	0	0	0	
9060861	1	157	17	0	0	0	0	0	0	
9060861	2	228	2	0	0	0	0	0	0	
9060861	3	363	46	4	0	0	2	4	2	Med

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060862	1	158	33	0	0	0	0	0	0	
9060862	2	201	22	5	6	0	3	5	9	Med
9060862	3	349	8	3	1	0	0	3	1	
9060871	1	159	42	11	31	1	5	12	36	Low
9060871	2	223	55	0	11	2	8	2	19	Med shattered
9060871	3	328	0	11	5	0	0	11	5	
9060872	1	160	54	1	38	0	4	1	42	Med
9060872	2	247	8	1	0	0	0	1	0	
9060872	3	358	4	3	12	0	3	3	15	Med
9060873	1	161	25	3	2	0	16	3	18	Med uniform
9060873	2	203	46	21	11	9	7	30	18	Low
9060873	3	364	11	8	0	1	9	9	9	Med
9060874	1	162	15	1	0	0	0	1	0	Low
9060874	2	262	8	0	0	0	0	0	0	
9060874	3	303	27	3	40	0	0	3	40	
9060875	1	163	3	0	0	0	0	0	0	
9060875	2	215	0	7	0	0	0	7	0	
9060875	3	326	0	7	0	0	0	7	0	
9060876	1	164	30	0	3	0	0	0	3	
9060876	2	241	0							Dead
9060876	3	324	12	3	20	0	2	3	22	Low
9060877	1	165	31	3	0	0	10	3	10	Uniform
9060877	2	253	9	5	5	1	9	6	14	Med
9060877	3	315	17	5	6	0	16	5	22	Tall uniform
9060878	1	166	19	2	0	0	7	2	7	Med
9060878	2	266	32	0	0	0	0	0	0	
9060878	3	344	56	1	15	0	4	1	19	Tall
9060879	1	167	0	8	0	1	3	9	3	Med
9060879	2	209	9	0	0	0	0	0	0	

Accession	Rep	Plot	Spread ¹ (no. sq dm)	Flowers ²	Pods ³	Flowers ²	Pods ³	Total Flowers ²	Total Pods ³	Comments:
9060879	3	322	0							Dead
9060880	1	168	51	9	0	0	21	9	21	Med uniform
9060880	2	206	11	3	0	0	0	3	0	
9060880	3	361	31	3	1	0	2	3	3	Med
9060881	1	169	0							Dead
9060881	2	256	33	5	0	0	2	5	2	Med shattered
9060881	3	360	0							Dead

¹ Plant spread was determined using a one square meter frame with strings attached every ten centimeters, dividing the frame into 100 square decimeters (dm). The frame was placed over the plots and the number of squares that contained a portion of a powderpuff plant were counted. Note: this was not the total spread of each plant because many grew beyond the edges of the meter frame.

² No. Flowers refers to the number of circular flower clusters counted within the one square meter frame described above, not to the number of individual flowers.

³ The number of pods counted within the one square meter frame described above.

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