

Release of Experimental Perennial Peanut Germplasm and Cultivars for the Southern U.S.

Germplasm:

Developers: G. M. Prine, A. R. Blount, E. C. French, M. W. Williams, and K. H. Quesenberry

1. PI 262839 (Arblick):

Arblick is a plant introduction (PI 262839) that was among the early lines tested by the USDA-SCS at the Arcadia and Brooksville Plant Materials Centers, but was not officially released by the USDA-SCA and University of Florida.

This accession was collected in the town of Bela Vista, located on the border of Brazil and Paraguay.

It has large stems and dark green leaves, and its profuse flowers are a creamy yellow color.

Arblick was considered to be slow at establishment, with lower forage potential (similar to that of Ecoturf, but approximately 1 ton/A less yield than Florigraze).

Arblick has not been widely grown but has potential as an environmental turf, ornamental planting and for forage. In 2002 the Florida Nurserymen and Growers Association (FNGA) listed perennial peanut as one of the 2002 Florida Plants of the Year.

2. PI 262840 Perennial Peanut (Ecoturf):

This PI was identified by Drs. Prine and French in the early 1990s as a low growing “ground cover” type plant.

This PI was collected along the Brazil-Paraguay border, near where Arblick was collected.

It has been shown to form an established ground cover more rapidly than Arblick

Forage yields of Ecoturf are typically 1 ton/A lower than Florigraze.

This PI has yellow-orange colored flowers, compared to the paler yellow color of Arblick flowers. It is a lower growing type that flowers profusely during its growing season.

While this PI does titer for PSV, it rarely shows leaf mottling or disfigurement due to the virus.

Although not officially released by the University of Florida, PI 262840 has already gained some acceptance by the commercial landscape industry, mostly for its use as an ornamental turf. In 2002 the Florida Nurserymen and Growers Association (FNGA) listed perennial peanut as one of the 2002 Florida Plants of the Year.

Cultivars:

Developers: K. H. Quesenberry, A. R. Blount, P. Mislevy, E. C. French, M.J. Williams, and G. M. Prine

1. PI 262826 (suggested name: “UF-Tito”)

This genotype originates from Paraguay and was collected in 1959 by W.C. Gregory.

It was first identified by Freire et al. (2000) as the top line out of a 10-yr evaluation experiment at the AFRU near Gainesville.

In multi-location experiments over a 15-yr period yields were generally equal to or higher than Florigraze.

PI 262826 had the highest percent pure peanut (lowest invasion by weedy common bermudagrass) and an aggressive growth habit.

Freire et al. (2000) also showed that PI 262826 had the highest spread rating among 18 entries in their experiment.

All plantings of PI 262826 were negative for Peanut Stunt Virus (PSV) and do not have any discoloration of leaves due to that virus.

This PI offers genetic diversification from Florigraze, the cultivar that dominates the planted acreage and is essentially a monoculture.

2. Selection 15 (suggested name: “UF-Peace”)

This plant selection was received under ID numbers that would trace it to PI 262826 = Arblick, but it appears phenotypically different from Arblick. Recent AFLP evaluation by Dr. Andrea Mass, USDA-ARS, Tifton, GA, indicated that the material is different from Arblick and all other known PI germplasm.

Like PI 262826, Selection 15 resembles the plant type of Florigraze.

In multi-location evaluation experiments over a 15-year period, Selection 15 exhibited high dry matter yields that were comparable to Florigraze.

This selection is similar to Florigraze in competition with weedy common bermudagrass.

Only one replication of Selection 15 was positive for Peanut Stunt Virus (PSV), compared to plantings of Florigraze, where all replications showed prominent viral symptoms.

Selection 15 may have better adaptability in the upper Coastal Plains as indicated by its performance at Ft. Valley, GA (Terrill, et al., 2003). The authors report that selection 15 had the best combination of percent emergence, survival, and lateral spread among the entries evaluated.

Selection 15 offers genetic diversification from Florigraze, the cultivar that dominates the planted acreage. Although Selection 15 is similar in yield and appearance to PI 262826, we are proposing the release of this selection as another source of genetic variability to broaden the perennial peanut germplasm available for production in the southeastern USA.

If approved for release, we will request a new PI number for this selection.

Perennial Peanut

History

Rhizoma perennial peanut (*Arachis glabrata* Benth.; RPP), better known as perennial peanut, was originally collected in Brazil in the 1930s and introduced into the USA (Florida) in 1936 (PI 118487). While some interest in the perennial peanut as a forage was generated, it was not promoted as a viable forage until the USDA Soil Conservation Service (USDA-SCS, now the Natural Resources Conservation Service, or NRCS) conducted trials with plant introductions at the Arcadia and later Brooksville Plant Materials Centers. Based on these early evaluations, USDA-NRCS eventually distributed an accession named “Arb” (PI 118457) although no formal release documents are known. Other plant introductions from South America were brought into the USA and were tested at several locations in the southern states. In general, the perennial peanut appeared to be well adapted to the light sandy soils of the southern Gulf Coast region of the USA. It was drought tolerant, grew well on low-fertility soils, and seemed relatively free from disease or insect pest problems. Mechanization of sprigging and harvesting, coupled with the relatively impressive forage yields of some accessions, gave the perennial peanut a reputation as a promising warm-season perennial forage legume for the southern Gulf Coast. Due to its high quality, locally grown perennial peanut hay increasingly competes for the million plus dollar hay market currently satisfied by imported alfalfa.

Cultivars and Germplasm

Arb was the first RPP distributed to the general public and grown commercially in the USA. The plant was collected by W. Archer, a plant explorer, in 1936, near Campo Grande, Brazil (Prine, 1964). The plant has large leaves, a coarse stem and bright yellow-orange flowers. Conway and Ritchey (1949) observed that the plant had forage potential, but it was not until after the USDA-SCS tested and promoted the accession, that it received recognition as a promising new forage (Blickensderfer et al., 1964). Another plant introduction (PI 262839) was among the early lines tested by the USDA-SCS at the Arcadia and Brooksville Plant Materials Centers. This accession was collected in the town of Bela Vista, located on the border of Brazil and Paraguay. It has large stems and dark green leaves, and its flowers are a creamy yellow color. It was given the name Arblick and distributed to local producers although no formal release is known. Arblick, generally, is slow to establish, has limited forage potential and is not widely grown. Nevertheless, we are proposing a germplasm release jointly with USDA-NRCS to document the research evaluations that have been conducted.

In 1962, at the University of Florida, Gainesville, an unusual plant was observed growing between two experimental plots of Arb and PI 151982 (Prine, 1973; Prine et al., 1986b). The plant was physically different from the other accessions in that trial. It was thought to be a natural outcrossing between the two plant introductions or a vigorous seedling from Arb. Dr. Gordon Prine, Forage Agronomist at the University of Florida, selected this material and tested it in perennial peanut trials as Gainesville Selection No. 1 (GS-1). It was later formally released as ‘Florigraze’ (Figure 1; PI 421707) (Prine et al., 1981). The rhizome size of Florigraze is smaller than those of Arb or Arblick. The rhizome mat of Florigraze has more budding points and more shoots per unit area of rhizome than either Arb or Arblick (Prine, et al., 1981). It has flowers that are a yellow-orange color, similar to the flower color of Arb. The plant performed well in

field trials and was released jointly by the University of Florida and the USDA-SCS in 1978. To date, this cultivar dominates the acreage of perennial peanut planted in the southern USA.



Figure 1. Florigraze Rhizoma Perennial Peanut.

The University of Florida and the USDA-SCS jointly released another plant introduction, ‘Arbrook’ (Figure 2; PI 262817) in 1985 (Prine et al., 1986a, 1990). Arbrook was a plant introduction from Paraguay that was first introduced into the USA in 1959. It had been noted as a superior accession of rhizoma peanut at the Arcadia and Brooksville Plant Materials Centers, and at the University of Florida. Normally, Arbrook has larger stems, leaves, stolons, and rhizomes and fewer flowers than Florigraze. It also has earlier spring growth, is less winter hardy and forage yields of Arbrook are often higher than that of Florigraze. Forage quality of both varieties is similar (Prine et al. 1986a). Its major limitations are that it is less tolerant of poor soil drainage and has winter-killed on heavy soils in northwest Florida and at Americus, GA (Prine et al., 1986a). In recent field trials at Marianna, FL, it has yielded well and has a longer seasonal growth pattern than the other varieties tested.



Figure 2. Arbrook Rhizoma Perennial Peanut.

Two other ornamental perennial peanut plant introductions, Brooksville 67 (“waxy leaf”, PI 262801) and Brooksville 68 (“pointed leaf”, NRCS #9056068) germplasm (*A. glabrata* types) were released by the USDA-NRCS Brooksville Plant Materials Center in 2002 (Pfaff and Maura, 2005). They are both low-growing, leafy types with distinctive leaf shapes. Germplasm is available through USDA-NRCS, Plant Material Center, 14119 Broad Street, Brooksville, FL 34601, 352-796-9600.

The release of new germplasm and cultivars of perennial peanuts should benefit producers by providing higher yielding and more aggressive perennial peanut cultivars available for planting. Probably as important, is that that diversifying the perennial peanut plantings with other genotypes of *A. glabrata* will avoid the “monoculture” system of Florigraze that currently exists throughout much of the southeast U.S. growing area.

Research supporting germplasm and cultivar releases

In 1987 a collection of approximately 100 plant introductions of RPP was planted in replicated small plots at the Agronomy Forage Research Unit (AFRU) located near Gainesville. The introductions were evaluated for rate of spread and coverage for two years (Ruttinger-Lamperti, 1989). In 1990, 15 superior lines were selected from this experiment and planted in a second replicated experiment at the AFRU. In addition to the 15 selections, the cultivars Florigraze and Arbrook and a selection designated Arbrook Select were planted in this experiment for a total of 18 lines. This experiment was harvested for four growing seasons after establishment. After this time, the experiment was not harvested for five years, but weeds and forage were removed once annually. The plots were harvested again in 1999, and from the results of this ten year experiment, three lines were selected [PI 262826 (a.k.a. #2), PI 262839 (a.k.a. #15), and Ecoturf (P.I. 262840) for evaluation at multiple locations in Florida and Georgia (Freire, et al., 2000).

Plots were planted at Marianna, FL, and at the Range Cattle Research and Education Center at Ona, FL, and at Fort Valley State University, GA, in February 2000. An additional location was planted at the Plant Science Research and Education Center at Citra, near Gainesville, FL, in summer 2001. In addition to the three new selected lines, the cultivars Florigraze and Arbrook were included for comparison. At Marianna, plots were harvested in 2002 through 2006. At the Gainesville-Citra location plots were harvested in 2003 through 2006. At the Ona Range Cattle Station plots were harvested in 2000 through 2003. At Fort Valley, plots were evaluated for percentage lateral spread in 2001 and 2002. Dry matter yields of the various cultivars and experimental lines are reported in Tables 1 thru 8. Forage nutritive data was collected from dry matter (DM) samples at Marianna in 2006 (Table 9), Citra in 2005 (Table 10), and at Ona in 2002 (Table 11, from Mislevy et al., 2007).

Much of the data related to Ecoturf has been observational and where other data is available it is primarily DM yield data. Some color and appearance ratings figures were reported by French et al. (2001, revised 2006), and these will be included. This PI is proposed for a germplasm release only to document the dual purpose ornamental and forage characteristics of the line.

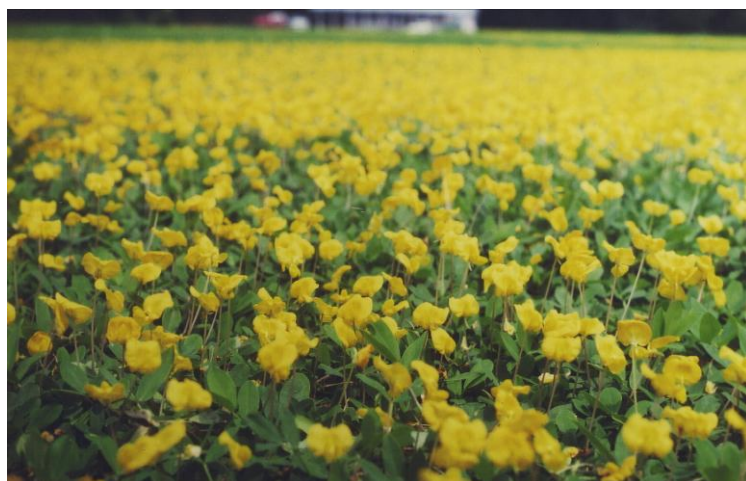


Figure 3. Heavily Flowering Rhizoma Perennial Peanut in a Lawn Environment

Release of PI 262840 (aka. Ecoturf) and PI 262839 (aka. Arblick) Rhizoma Perennial Peanut Germplasm

Developers: G. M. Prine, A. R. Blount, E. C. French, M. W. Williams, and K. H. Quesenberry

These PIs have been identified over a number of years of evaluations by Drs. Gordon Prine and Tito French as a low growing “ground cover” type plants. They have been evaluated at numerous locations in Florida. The name Arblick was given to PI 262839 by the NRCS PMC at Brooksville when this PI was being considered for forage use, but subsequently other lines proved superior and this line was not pursued. The name Ecoturf was suggested for PI 262840 since this line demonstrated the ability to maintain acceptable plant appearance with reduced water compared with typical turf type lawn grasses. A breeder planting material block of this introduction was established at the Plant Science Research and Education Center in 1999 and limited quantities of plant material were distributed to commercial propagators in the mid 1990s. This PI was collected along the Brazil-Paraguay border, near where Arblick was collected. Flowers of PI 262840 are a yellow-orange color compared to the paler yellow color of Arblick flowers. Arblick and Ecoturf are lower growing types that flowers profusely during the growing season (Figure 4). Ecoturf has already gained some acceptance by the commercial landscape industry, mostly for its use as an ornamental turf, and was recognized as the 2002 Florida Plants of the Year by the Florida Nurserymen and Growers Association.

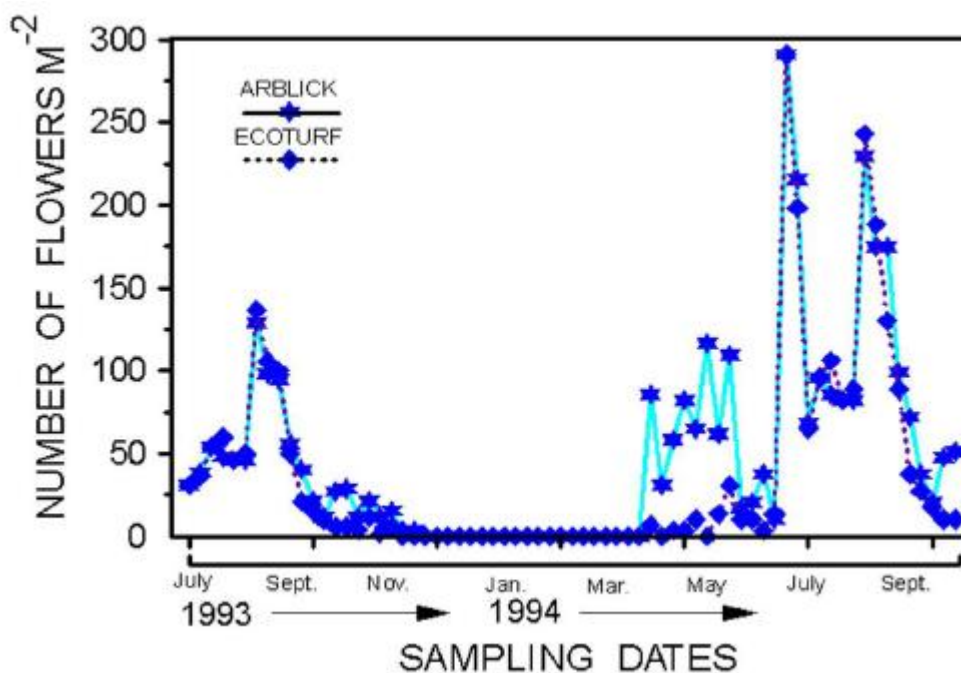


Figure 4. Flowering of PI 262840 (Ecoturf) Compared to Arblick (From French et al., 2001)

Turf color ratings (where 1 is yellow/straw color and 9 is dark green) were consistently higher under water stress conditions for RPP than for St. Augustinegrass. Low levels of applied water resulted in die-back of St. Augustinegrass, with no such long term impact on RPP (French et al., 2001).

An experiment evaluating the effect of extended photoperiod on rate of spread and subsequent dry matter yield was conducted at the Range Cattle Research and Education Center by Dr. Mimi Williams (Williams et al., 2008). Results from this study of six rhizoma peanut germplasm lines (Arblich not included) showed that PI 262840 (Ecoturf) appeared to be the least sensitive in terms of above ground growth to extended photoperiod in the field. That is to say, the other lines tested had higher rates of spread and higher dry matter yields under extended photoperiod compared to normal fall and spring day lengths, whereas Ecoturf rates of spread and dry matter yields were similar between normal and extended day lengths. This lower response from Ecoturf is perhaps not unexpected as it is a cultivar which has been developed as a low maintenance turf selection needing infrequent mowing. In contrast, the other five selections are forage type material with emphasis on DM production. This suggests that PI 262840 should remain green actively growing throughout the fall and spring, unless top growth is damaged by frost and freezes. It also suggests that this line should demonstrate superior rates of spread under short day establishment conditions.

These findings suggests that PIs 262839 and 262840 are best suited as low growing ground cover selections that are best adapted to the lower Coastal plains and peninsular Florida. In frost free areas, they are likely to show superior growth and turf traits.



Figure 5. PI 262840 Perennial Peanut as a Groundcover in Highway Median

Release of PI 262826 Rhizoma Perennial Peanut Cultivar (Suggested name: ‘UF-Tito’)

Developers: K. H. Quesenberry, A. R. Blount, P. Mislevy, E. C. French, M.J. Williams, and G. M. Prine

This genotype originates from Paraguay and was collected in 1959 by W.C. Gregory. This plant introduction resembles the plant type of Florigraze. It was tested at Ona, Gainesville, and Marianna, FL, and at Fort Valley, GA, for general agronomic attributes and DM yields. It was first identified by Freire et al. (2000) as the top line out of a 10-yr evaluation experiment at the AFRU near Gainesville. In addition to having high dry matter yields in this 10-yr evaluation experiment, PI 262826 had the highest percent pure peanut (lowest invasion by weedy common bermudagrass) and greatest amount of spread outside the plot area at AFRU (Freire et al., 2000).

Although some genotype x location effects are evident in the data, the results of the multi-location evaluations (Tables 1- 8) validate the earlier results and point to the high yielding attributes of this line. At Ona, this line generally was not different in DM yield from most other entries in the test. Yields were relatively consistent over the experiment with only a slight decrease in DM yield over the period of the experiment whereas other selections decreased in persistence and yield (Table 8). At Citra, PI 262826 was not different ($P=0.05$) in yield among entries in three of the four years although in most years it was similar in yield to Florigraze. Four year average total seasonal DM yield among all entries ranged from 8,000 to 11,000 lb/acre (Tables 1 to 4). Over the five harvest years at Marianna, PI 262826 generally had significantly higher DM yields than Florigraze but was not higher than Arbrook (Tables 6-8). This PI has shown less invasion by weedy common bermudagrass than other lines and cultivars that were evaluated at multiple locations, with a rating of 91% pure RPP 10 years after establishment (Freire et al., 2000). Freire et al. (2000) also showed that PI 262826 had the highest spread rating among 18 entries in their experiment.

In recent years, the identification of peanut stunt virus (PSV) in commercial fields of Florigraze has raised concerns about genetic vulnerability because Florigraze dominates the planted acreage and is essentially a monoculture. The experimental planting reported by Freire et al. (2000), from which PI 262826 was identified as a superior line, was sampled in spring 2002 for the presence of PSV in top growth. Samples from all four replications of Florigraze and Arbrook tested positive for PSV, whereas all four reps of PI 262826 were negative for PSV. This PI showed none of the visual yellowing and mosaic symptoms shown in all four replicates of Florigraze. Although this is only one set of data regarding the incidence and susceptibility of rhizoma perennial peanut to PSV and does not conclusively show that PI 262826 is “resistant”, we feel that the 12-year exposure of entries in this experiment (established in 1990) should be a good indicator of “field tolerance”. A major justification for release of this PI is to provide additional sources of genetic variability in RPP especially in light of the recently documented issues related to PSV in some large Florigraze plantings.

Tables 9 to 11 summarize nutritive value data accumulated on PI 262826 during the period of these evaluations. Crude protein values from the September 2006 harvest at Marianna (Table 9) were slightly higher (range 17 to 20%) than those from the two harvests at Citra (Table 10) in 2005 (range 14 to 16%), however there were no differences among entries at either location. These values are similar to values reported for alfalfa at similar stages of maturity. The TDN

analyses of the 2006 harvest at Marianna ranged from 51% (Arbrook) to 57% (PI 262840), and the value for PI 262826 was 56%. At second harvest in 2005 at Citra, IVOMD values ranged from 62% (Arbrook) to 68% (PI 262840), and PI 262826 had values of 64%. Nutritive values for PI 262826 at the June and October harvests at the Ona (Table 11) were also intermediate between PI 262840 and Arbrook. A summary of these nutritive value analyses suggests that lower growing “turf types” like PI 262840 (probably higher leaf to stem ratios) will have higher values than the larger stem lines, e.g., Arbrook; PI 262826 is intermediate in growth habit and stem size between these lines. In general, rhizoma perennial peanut nutritive values are similar to alfalfa at comparable stages of maturity and not a limiting factor in livestock nutrition provided by RPP.

Release of Selection 15 Rhizoma Perennial Peanut Cultivar (Suggested name: ‘UF-Peace’)**Developers: K. H. Quesenberry, A. R. Blount, P. Mislevy, E. C. French, M.J. Williams, and G. M. Prine**

This vegetative planting material that we are proposing to release was received from Charles Simpson at the Texas A & M Research Center at Stephenville, TX, as collection # P-2352. In conversation with Dr. Simpson in March 2007, he indicated to Dr. Quesenberry that P-2352 is equivalent to collection # GKP 9642 which is equivalent to PI 232839. This material was tested at Arcardia and Brooksville, FL, and “named” Arblick, but not formally released. However, Dr. Blount and Quesenberry have had plots of “Arblick” and Selection 15 vegetative material appears phenotypically different from Arblick. Recent personal communications with Dr. Andrea Mass, USDA-ARS, Tifton, GA, who is conducting AFLP genetic profiling of RPP germplasm, indicated that the material we are proposing to release is very different in AFLP patterns from Arblick. Additionally she indicated that no AFLP profile that she has obtained from any currently available PI matches the profile of this material. As a result of the observed phenotypic and genetic differences, we believe that the provenance of this selection is questionable and we will no longer link Selection 15 with PI 232839. If approved for release, we will request a new PI number for this selection.

Like PI 262826, Selection 15 resembles the plant type of Florigraze. Dry matter yields of Selection 15 are similar to PI 262826 in trials at the AFRU near Gainesville, the PSREU at Citra, the NFREC at Marianna, and the Range Cattle REC at Ona. Yield and data from test sites are reported in Tables 1 through 10. Yields of selection 15 are generally not statistically different from Florigraze but often numerically superior to Florigraze at these locations. The four-year summary data from Citra (Table 4) shows that this genotype is higher in DM yields than Florigraze and similar in dry matter yield to Arbroom. In the five-year summary data from Marianna (Table 8), this selection was not different from Florigraze or Arbroom.

This PI is similar to Florigraze in competition with weedy common bermudagrass. Freire et al. (2000) reported percentages pure RPP of 76 and 71 for Florigraze and Selection 15, respectively. In this experiment at the AFRU near Gainesville, Selection 15 had similar spread ratings as Florigraze 3.3 and 3.8, respectively. Selection 15 may have better adaptability in the upper Coastal Plains as indicated by its performance at Ft. Valley, GA (Terrill, et al., 2003). In this experiment it had higher ($P < 0.10$) percent emergence than all other entries except Arbroom. In year two of this experiment, Selection 15 had greater lateral spread than all other entries. The authors report that selection 15 “had the best combination of percent emergence, survival, and lateral spread on any of the rhizoma peanut types we tested.” This finding of rapid emergence, spread, and plot infill may be responsible for the first year harvest data at Citra, where Selection 15 was superior to Florigraze and PI 262826.

As reported in our discussion of PI 262826, the identification of peanut stunt virus (PSV) in commercial fields of Florigraze has raised concerns about the genetic vulnerability of this cultivar. In the experiment reported by Freire et al (2000) from which Selection 15 was identified as meriting further evaluation, sampling for the presence of PSV in top growth in spring 2002 showed that only one of four replications of Selection 15 tested positive for PSV. All replications of Florigraze and Arbroom tested positive for PSV in contrast to all replications

of PI 262826 which, as previously reported, were negative for PSV. Only the one positive rep of Selection 15 showed minor visual yellowing and mosaic symptoms whereas all replications of Florigraze were showing prominent symptoms. Although Selection 15 is similar in yield and appearance to PI 262826, we are proposing the release of this selection as another source of genetic variability to broaden the perennial peanut germplasm available for production in the southeastern USA.

Tables 9 to 11 summarize nutritive value data accumulated on Selection 15 during the period of these evaluations. Crude protein values from the September 2006 harvest at Marianna (Table 9) were slightly higher (range 17 to 20%) than those from the two harvests at Citra (Table 10) in 2005 (range 14 to 16%), however there were no differences among entries at either location. At Marianna, PI 262826 was among the lines with the numerically highest values and also among the lines with the highest values at Citra. These values are similar to values reported for alfalfa at similar stages of maturity. The TDN analyses of the 2006 harvest at Marianna ranged from 51% (Arbrook) to 57% (PI 262840), and the value for Selection 15 was 55%. At second harvest in 2005 at Citra, IVOMD values ranged from 62% (Arbrook) to 68% (PI 262840), and Selection 15 had values of 65%. Selection 15 nutritive values at the June and October 2002 harvests at Ona (Table 11) were also intermediate between PI 262840 and Arbrook. A summary of these nutritive value analyses suggests that lower growing “turf types” like PI 262840 (probably higher leaf to stem ratios) will have higher values than the larger stem lines, e.g., Arbrook. Selection 15 is intermediate in growth habit and stem size between these lines. In general, rhizoma perennial peanut nutritive values are similar to alfalfa at comparable stages of maturity and not a limiting factor in livestock nutrition provided by RPP.

Table 1. Dry Matter Yield PSREU Citra Perennial Peanut Forage Trial, 2003.

Entry #	Identification	Harvest 1	Harvest 2	Harvest 3	Total
		-----lb/A-----			
1	PI 262840	3190 a	4350 a	1130 b	8670 a
2	PI 262826	2360 a	5160 a	1410 b	8930 a
3	Selection 15	5150 a	5060 a	1260 b	11470 a
4	Florigraze	3170 a	4270 a	1150 b	8590 a
5	Arbrook	4910 a	5040 a	2320 a	12270 a
6	Arbrook Select	4310 a	5200 a	2310 a	11820 a
	lsd $P=0.05$	2509	1620	807	4230
	c.v.	43	22	33	28

Table 2. Dry Matter Yield PSREU Citra Perennial Peanut Forage Trial, 2004

Entry #	Identification	Harvest 1	Harvest 2	Total
		-----lb/A-----		
1	PI 262840	2660 b	4800 a	7460 a
2	PI 262826	4300 ab	6990 a	11290 a
3	Selection 15	3640 ab	7140 a	10780 a
4	Florigraze	2850 b	5330 a	8180 a
5	Arbrook	3420 ab	5640 a	9060 a
6	Arbrook Select	5180 a	6020 a	11200 a
	lsd $P=0.05$	1980	2547	2548
	c.v.	36	28	28

Table 3. Dry Matter Yield PSREU Citra Perennial Peanut Forage Trial, 2005.

Entry #	Identification	Harvest 1	Harvest 2	Harvest 3	Total
		-----lb/A-----			
1	PI 262840	3130 c	4890 ab	930 c	8950 b
2	PI 262826	3940 bc	7170 a	2130 abc	13240 ab
3	Selection 15	3020 c	6270 ab	1490 bc	10780 ab
4	Florigraze	3740 bc	4230 b	1220 bc	9190 b
5	Arbrook	5840 ab	5780 ab	3000 a	14620 ab
6	Arbrook Select	6470 a	6130 ab	2590 ab	15190 a
	lsd $P=0.05$	2280	2215	1355	5180
	c.v.	35	25	47	28

Table 4. Dry Matter Yield PSREU Citra Perennial Peanut Forage Trial, 2006, and Means Over Years

Entry #	Identification	2006			Mean	
		Harvest 1	Harvest 2	Total	2003 – 2005	2003 – 2006
		-----lb/A-----				
1	PI 262840	2010 a	4350 a	6360 a	8360	7860
2	PI 262826	2680 a	5590 a	8270 a	11153	10433
3	Selection 15	2760 a	4780 a	7540 a	11010	10143
4	Florigraze	2560 a	3710 a	6270 a	8653	8058
5	Arbrook	2390 a	4860 a	7250 a	11983	10800
6	Arbrook Select	3210 a	5350 a	8560 a	12737	11693
	lsd $P=0.05$	1920	1760	3021		
	c.v.	49	24	27		

Table 5. Cold Damage Rating and Dry Matter Yield NFREC Marianna Perennial Peanut Forage Trial, 2002-2004.

Entry #	Identification	Cold damage†	2002		2003		2004	
			Harvest 1	Harvest 2	Harvest 1	Harvest 2	Harvest 1	Harvest 2
-----lb/A-----								
1	PI 262840	9.0 a	3030 c	3090 c	2050 d	5230 b	100 d	6020 b
2	PI 262826	3.5 c	4900 b	4380 ab	5640 b	6210 a	2190 b	7080 ab
3	Selection 15	6.3 b	5050 b	4020 b	4520 c	5780 ab	1160 c	7850 a
4	Florigraze	3.3 c	4960 b	2780 c	4210 c	5810 ab	2710 ab	6980 ab
5	Arbrook	1.0 d	7080 a	4570 ab	6750 a	5910 ab	3300 a	7560 a
6	Arbrook Select	1.0 d	6630 a	4650 a	6700 ab	5680 ab	2810 ab	7430 a
LSD (0.05)		1.0	850	590	1100	810	840	1360
CV (%)		16.5	10.8	9.9	14.7	9.4	27.4	12.6

†Cold damage rating 1/29/01 based on a 1-10 rating scale: 1=no leaf tissue damage and 10=complete leaf burn after the first frost event.

Table 6. Dry Matter Yield Marianna Perennial Peanut Forage Trial, 2005-2006.

Entry #	Identification	Cold damage	2005			2006		
			Harvest 1	Harvest 2	Harvest 3	Harvest 1	Harvest 2	Harvest 3
-----lb/A-----								
1	PI 262840	9.0 a	2150 c	5771 bc	992 c	1780 c	2438 c	4458 bc
2	PI 262826	3.5 c	3989 ab	6612 ab	2288 a	2454 b	2612 bc	4413 bc
3	Selection 15	6.3 b	2993 bc	7612 a	1413 bc	1001 d	3632 ab	5269 a
4	Florigraze	3.3 c	3607 ab	5451 c	1342 bc	1811 c	3492 abc	4093 c
5	Arbrook	1.0 d	4213 a	7692 a	2426 a	3128 a	3857 a	4836 ab
6	Arbrook Select	1.0 d	4364 a	6916 a	2042 ab	3394 a	4254 a	3957 c
LSD (0.05)		0.992	1062	1102	777	604	1061	717
CV (%)		16.5	19.8	10.9	29.5	17.7	20.8	10.6

†Cold damage rating date??? Based on a 1-10 rating scale: 1=no leaf tissue damage and 10=complete leaf burn after the first frost event.

Entry #	Identification	2002	2003	2004	2005	2006	5-year Average
		-----lb/A-----					
1	PI 262840	6120	7276	6124	8913 d†	8675 b	7422
2	PI 262826	9282	11850	9271	12890 ab	9479 b	10554
3	Selection 15	9073	10300	9010	12020 bc	9902 b	10061
4	Florigraze	7743	10020	9687	10400 cd	9396 b	9449
5	Arbrook	11650	12660	10850	14330 a	11820 a	12262
6	Arbrook Select	11290	12380	10240	13320 ab	11600 a	11766

†Means in the same column followed by the same letter were not different at $P = 0.05$ using Waller-Duncan's Test.

Entry #	Identification	2000	2001	2002	2003	4-year Average
		-----Tons/A-----				
1	PI 262840	4.1 d†	3.2 ab	4.0 a	7.7 a	4.7
2	PI 262826	6.2 bc	3.3 ab	4.5 a	5.8 a	4.9
3	Selection 15	6.3 b	3.3 ab	3.4 a	5.9 a	4.7
4	Florigraze	5.4 c	3.5 ab	3.6 a	6.8 a	4.8
5	Arbrook	8.3 a	3.5 ab	2.8 a	4.9 a	4.9
6	Arbrook Select	8.3 a	3.8 a	2.6 a	4.4 a	4.8
Mean		6.0	3.3	3.6	5.8	

†Means in the same column followed by the same letter were not different at $P = 0.05$ using Waller-Duncan's Test.

Table 9. Perennial Peanut Forage Analyses Results (% dry matter basis, September 2006 NFREC Marianna data)

Item	Perennial Peanut Entry						Alfalfa†
	Florigraze	Arbrook	PI 262840	Arbrook Select	Selection 15	PI 262826	
Crude protein	18	17	20	17	19	20	17-20
Acid detergent fiber	34	40	34	40	36	34	32-39
Neutral detergent fiber	45	51	43	50	45	42	39-49
Lignin	8	9	8	9	9	8	6-9
Ash	10	11	11	11	11	10	8-9
Calcium	2.2	2.1	2.0	2.2	2.2	2.1	1.2-1.6
Phosphorus	.3	.3	.3	.3	.3	.3	.2-.3
Lysine	.9	.9	1.0	.8	1.0	1.0	.8-1.0
Methionine	.3	.3	.3	.3	.3	.3	.3
TDN‡	55	51	57	51	54	56	50-64
Net Energy –							
Lactation, Mcal/lb	.56	.49	.59	.50	.55	.58	.50-.64
Maintenance, Mcal/lb	.49	.41	.53	.42	.48	.52	.44-.59
Gain, Mcal/lb	.24	.16	.27	.17	.22	.27	.19-.33
Relative feed value	128	105	132	108	126	130	110-160

†NRC (2000) table values

‡TDN = total digestible nutrients

Table 10. Forage Quality in 2005 and 4-yr Average Yield of Peanut Forage at PSREU Citra.

Entry #	Identification	Harvest 2		Harvest 3		4-yr Average Yield
		Crude protein	IVOMD	Crude protein	IVOMD	
		-----%-----				-----lb/A-----
1	PI 262840	14.2 a	66.7 a	15.2 b	66.8 a	7860
2	PI 262826	14.8 a	63.8 bc	17.1 a	65.1 a	10433
3	Selection 15	16.1 a	64.7 ab	16.4 a	66.0 a	10143
4	Florigraze	15.2 a	64.6 ab	14.9 b	65.3 a	8058
5	Arbrook	15.3 a	62.1 c	15.0 b	64.4 a	10800
6	Arbrook Select	14.2 a	62.0 c	14.6 b	64.9 a	11693
	lsd $P=0.05$	1.9	2.3	2.5	2.5	
	c.v.	8.4	2.4	4.4	2.5	

Table 11. Rhizoma Perennial Peanut Nutritive Value at Two Harvest Dates in 2002 at the RCREU Ona.					
		Harvest 1		Harvest 2	
Entry #	Identification	Crude protein	IVOMD	Crude protein	IVOMD
		-----%-----			
1	PI 262840	19.3	68.1	15.4	66.4
2	PI 262826	17.6	68.5	14.9	65.1
3	Selection 15	17.6	68.4	13.9	65.6
4	Florigraze	16.3	70.0	12.6	68.5
5	Arbrook	14.7	68.8	12.1	64.6
6	Arbrook Select.	14.6	68.7	11.4	61.7

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