

## Advanced Evaluations of Brooksville 67 Germplasm and Brooksville 68 Germplasm Perennial Peanut (*Arachis glabrata*)

Between 1991 and 2001, Brooksville 67 Germplasm (NRCS accession number 9056067) and Brooksville 68 Germplasm (NRCS accession number 9056068) perennial peanuts were planted in several locations throughout Florida to determine adaptation range. Following is a description of these activities.

### Emerald Hills Ground Cover Study

The purpose of this study was to evaluate the performance of selected low-growing types of perennial peanut for use as ground cover on coarse well-drained soils. Results are applicable to citrus groves, in median strips next to roadways, and for xeriscape plantings in urban areas.

Two unreleased strains of perennial peanut (referred to as Brooksville 67 Germplasm and Brooksville 68 Germplasm) were established on a lot in the Emerald Hills subdivision in Citrus Co. on July 2, 1999. Two commercially available species, Ecoturf and Arblick, were planted as standards of comparison. Soils are Lake fine sands, which are deep and excessively drained. Rhizomes were hand-planted in shallow trenches placed 6" apart, in 6' x 10' plots, with four replicates. Two-foot wide strips of bahiagrass sod bordered each plot. Ecoturf had been obtained from the University of Florida, Gainesville, and had been dug with a sprig digger. The other 3 strains were hand dug from plots maintained at the Brooksville PMC, and rhizomes were longer than Ecoturf rhizomes. Planting rate was 120 – 140 bu./ac. Irrigation was not available at the time of planting; however, summer rains were adequate to keep plots moist. An underground sprinkler system was used later in the season to apply water at subsistence levels (less than 0.01 inches/day). Soil samples were taken at the time of planting. Average pH was 5.0, P was adequate for plant needs, but N, K and most micronutrients were low. No nutrients were applied during this study. Weeds were controlled by hand weeding. All plots were mowed 4 times to a height of 2 to 4 inches (5 to 10 cm) between April and late June of 2001. Mowing was stopped in July as it severely denuded the 9056067 plots. Plots were evaluated on November 18, 1999, July 20, 2000 and October 3, 2001. Statistical analysis was conducted using MSTATC (Michigan State University, 1988).

**Table 1. Average performance of 4 perennial peanuts at the Emerald Hills site 6 months after planting.**

Accession	% Cover	Height (cm)	Spread Rating (1-9, 9=0)	No. of Blooms/m <sup>2</sup>	Insect Injury (1-9, 1=0)	Disease Rating (1-9, 1=0)
Ecoturf	31b	3.3b	5.3b	5a	2	3
9056067	57a	10.5a	3.8a	1b	2	3
9056068	19bc	2.0b	6.0c	6a	2	3
Arblick	5c	3.0b	8.0d	2b	2	3

Accession means followed by different letters are significantly different by Tukey's HSD at P≤0.05.

Brooksville 67 Germplasm had significantly higher % cover, height, and spread than the other three accessions during the first 6 months of establishment. Ecoturf and 9056068 performed very similarly, with Arblick having very poor establishment. Ecoturf and 9056068 had the highest density of blooms, with 9056067 having almost none.

**Table 2. Average performance of 4 perennial peanuts at Emerald Hills site one year after planting.**

<b>Accession</b>	<b>% Cover</b>	<b>Height (cm)</b>	<b>Spread Rating (1-9, 9=0)</b>	<b>No. of Blooms/m<sup>2</sup></b>	<b>Insect Injury (1-9, 1=0)</b>	<b>Disease Rating (1-9, 1=0)</b>
Ecoturf	82a	6b	2.8a	4b	2	3
9056067	95a	11a	3.5a	5b	2	2
9056068	79a	3bc	3.0a	12a	2	3
Arblick	30b	2c	6.8b	2b	2	4

Accession means followed by different letters are significantly different by Tukey's HSD at P≤0.05.

**Table 3. Average performance of 4 perennial peanuts at Emerald Hills site two years after planting.**

<b>Accession</b>	<b>% Cover</b>	<b>Height (cm)</b>	<b>Spread Rating (1-9, 9=0)</b>	<b>No. of Blooms/m<sup>2</sup></b>	<b>Insect Injury (1-9, 1=0)</b>	<b>Disease Rating (1-9, 1=0)</b>
Ecoturf	71a	6.5a	4.8b	21b	4	5
9056067	74a	8.0a	6.0c	2b	2	2
9056068	80a	6.5a	6.3c	52a	2	4
Arblick	70a	6.8a	3.0a	30ab	3	4

Accession means followed by different letters are significantly different by Tukey's HSD at P≤0.05.

All strains were well established within 1 year, except Arblick, which did not become established until the second year. Percent cover declined for most species in 2001 because of severe drought conditions during the spring and summer. Arblick appears to be the most drought tolerant of the 4 accessions. Once established, it was able to aggressively colonize the area surrounding the plots despite unfavorable conditions.

Brooksville 67 Germplasm was substantially taller than the other three accessions, with a heavier canopy prior to mowing. While close mowing did not adversely affect 9056067 in the spring, it removed most of the leaves in the early summer after plant height increased. Plants required several weeks to produce new leaves. At this site, 9056067 should not be mowed below 5 inches during the summer months, when stems extend several inches above the ground. Perhaps because of the waxy coating on the leaves, this accession appeared to have less insect and leaf disease problems than the other accessions.

Despite droughty conditions in 2001, 9056068 produced the lowest, densest sod and a tremendous number of bright yellow blooms. Leaves were a darker green color than the other 3 accessions, which added to its attractiveness.

At this site, plants went dormant after a killing frosts, usually in November or December. Spring regrowth occurred around March 1. First blooms appeared around March 15.

## Single Plot Adaptation Plantings

**KML/Circle K Citrus Grove Planting, Punta Gorda, FL - Charlotte Co:** Rhizomes of Arbrook, Floragraze, 9056067 and 9056068 were established in September of 1991 in alleyways between citrus trees. The planting site lies next to a canal, and was reportedly flooded on at least one occasion during periods of heavy rains. Final evaluations were conducted in June of 2001. Established plot size was approximately 200 ft<sup>2</sup>. Plots were not replicated. All of the accessions had intermixed to some extent. The 9056067 stand had the greatest purity of the 3 types providing a 99% ground cover density within the plot compared to 70% ground cover density in the Floragraze plot and 50% ground cover density in the 9056068 plot. The Arbrook plot was too heavily infested with Floragraze to determine plot boundaries. The 9056068 plot was also heavily infested with Arbrook and Floragraze. Average plant height was 10, 6 and 12 cm respectively for 9056067, 9056068 and Floragraze. Brooksville 67 Germplasm had slightly higher disease resistance than did the other 2 accessions and was also rated as being the most effective ground cover at this site in terms of density. Floragraze was more effective in terms of spread. Brooksville 68 Germplasm had spread very little in 10 years, and was not as competitive, probably because it was easily shaded out by the taller types.

**2 x 4 Ranch Citrus Grove Planting, Arcadia, FL - DeSoto Co:** Rhizomes of Arbrook, Floragraze, Arblick, 9056067 and 9056068 were established in June of 1993 in alleyways between citrus trees. Plot size was 200 ft<sup>2</sup>. Plots were not replicated. Primarily due to dry conditions during establishment, only Arbrook and Arblick had reportedly established after 6 months, with percent ground cover being less than 1%. In June of 2001 the site was reevaluated. The Arbrook and Arblick had become well established. There was no trace of either 9056067 or 9056068.

A similar study was established in Collier Groves near Immokalee, FL. Arbrook, Arblick, 9056067 and 9056068 were established in plots with 2 replications. At an early evaluation, the Arbrook and 9056067 plots contained plants but the Arblick and 9056068 plots did not. These plots were destroyed prior to June of 2001, so no further data could be obtained.

**Florosa Elementary School Planting, Florosa, FL - Okaloosa Co:** Rhizomes of Arblick, 9056067 and 9056068 were established on the school grounds in April of 1997. Soils on this site are extremely coarse excessively drained sands. In June of 2001, only small amounts of Arblick had established. Droughty conditions and cold temperatures may have discouraged the establishment of the other two types.

**IFAS Immokalee Research Station Plantings, Immokalee, FL - Collier Co:** In April of 1998, plots of Floragraze, Arbrook, Arblick, Ecoturf, 9056067 and 9056068 were established at the Immokalee station. Plot size was 4' x 4' with 2 replications. Plots were irrigated to encourage establishment, and irrigated occasionally thereafter to maintain stands. The plots were examined by Brooksville PMC staff in June of 2001, to determine approximately how large an area each type had colonized. (Table 4). At this site, 9056068 tended to be lower growing and less aggressive than the other types. It also had

significantly more blooms. 9056067 tended to be low growing also, but was as aggressive as most other types in colonizing the surrounding area. It tended to have very few blooms.

**Table 4. Approximate plot diameter and plant height of perennial peanuts at the Immokalee IFAS Station, 3 years after establishment.**

Accession	Rep 1		Rep 2		Flowers/m <sup>2</sup>
	Diameter (ft.)	Height (cm)	Diameter (ft.)	Height (cm)	
Floragraze	34	36	43	15	6
Arbrook	20	26			
Arblick	24	32	20	28	
Ecoturf	43	18	34	14	4
9056067	30	12	41	11	1
9056068	24	14	30	14	30

**Tooke Family Farm Plantings, Gainesville, FL - Alachua Co:** Ecoturf, 9056067 and 9056068 were planted as a cover crop between rows of blackberries and blueberries. Plantings were made over a period of several years, as material became available. Soils are excessively well drained sands and plantings were irrigated during establishment and in times of severe drought. Time required to obtain a solid stand was 6 months to 2 years depending on planting density. Good stands were obtained from June and September/October plantings. August plantings did not establish well because of intense heat and inadequate moisture. All 3 types are well adapted to this site. Growth characteristics observed by Winston Tooke are shown in Table 5.

**Table 5. Growth characteristics of 3 perennial peanuts established in alleyways between blackberries and blueberries near Gainesville, FL.**

	Ecoturf	9056067	9056068
Establishment Vigor	excellent	excellent	good
Unmowed ht. (in.)	3 - 4	3 - 4	2 - 3
Desirable mowing ht. (in.)	2 - 2.5	2 - 2.5	1 - 1.5
Color of foliage	dark green	dark green with slight sheen to leaf	dark green
Color of flower	bright yellow	bright yellow	deeper yellow than other 2 types
Number and longevity of flowers	many and long	many and long	more and longer than other 2 types
First regrowth in the spring	10 days after 9056067	First to regrow	5 days after 9056067

Brooksville 68 Germplasm was also established as turf around the Tooke home in September of 1999. Planting rate was 0.5 bushes/100 ft<sup>2</sup> (218 bu./ac.). (The higher planting rate was used to shorten the amount of time required to obtain complete cover). The area was roto-tilled prior to planting. Rhizomes were spread out on the soil and covered with 2 - 3 inches of soil. At least 60% cover was obtained within 2 months. The peanuts continued to fill in the following year, and had 95% cover 2 years later, even after close mowing. 2,4-DB, 'Cadre', and 'Poast' were effective in controlling unwanted broadleaf weeds, grasses and sedges. Plots were fertilized with 0-10-20 at a rate of 0.1 lb./ac. at establishment and then annually if needed.