

Perennial Peanut Establishment

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Introduction

Rhizoma peanut, better known as perennial peanut, was brought from Brazil and introduced into Florida in 1936. 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) and now the Natural Resources Conservation Service (NRCS) conducted trials with plant introductions at the Brooksville and Arcadia Plant Materials Centers. Based on these early evaluations, USDA-NRCS eventually released an accession and named it “Arb” (PI 118457). Other plant introductions from South America were brought into the U.S. 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 U.S. It was drought tolerant, grew well on low-fertility soils, and seemed relatively free from any disease or insect pest problem. 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. However, slow field establishment rate has limited widespread use of perennial peanuts for forage production. New methods for rapid field establishment are currently being developed.

Varieties

Arb was one of the first rhizoma peanuts grown in the U.S. 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 collected and tested the accession, that it received any real recognition as a promising new forage (Blickensderfer et al., 1964).

“Arblick” (PI 262839) was also an early plant introduction that was tested by the USDA-SCS at Brooksville and Arcadia Plant Materials Centers. Arblick 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. Arblick, generally, is slow to establish, has limited forage potential, and is not widely grown.

In 1962, at the University of Florida, Gainesville, an unusual plant was observed between two experimental plots of Arb and PI 151982 (Prine, 1973; Prine et al., 1986b). The resulting plant was physically different from the 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), and later named it “Florigraze” (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. Its flowers 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 U.S.

The University of Florida and the USDA-SCS jointly released another plant introduction, “Arbrook” (PI 262817) in 1985 (Prine et al., 1986a, 1990). Arbrook was a plant introduction from Paraguay that was first introduced into the U.S. 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 for both varieties is similar (Prine et al. 1986b). Its major limitations are that it is less tolerant of poor soil drainage and has winter-kill on heavy soils in northwest Florida and at Americus, Georgia (Prine et al., 1986b). In recent field trials at Marianna, Florida, it has yielded well and has a longer seasonal growth pattern than the other varieties tested (A.R. Blount et al., unpublished).

The University of Florida has recently increased and distributed plant material of an ornamental or turf-type perennial peanut, named “Ecoturf” (PI 262840). Ecoturf was collected along the Brazil-Paraguay border, near where Arblick was collected, and the two may be closely related (Prine and French, unpublished). Ecoturf is considerably a more aggressive establisher than Arblick and its flowers are a yellow-orange color compared to the paler color of Arblick’s flowers. Ecoturf is a low growing and rapidly spreading type that flowers profusely during its growing season. While not officially released as a cultivar by the University of Florida, Ecoturf is gaining some acceptance by the industry, mostly for its use as an ornamental turf.

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 (by S.L. Pfaff and C. Maura, Jr.). They are both low-growing, leafy types with distinctive leaf shapes. Germplasm are available through USDA-NRCS, Plant

Material Center, 14119 Broad Street, Brooksville, FL 34601, (352) 796-9600.

Although there have been several attempts regionally to look at other accessions of *A. glabrata*, as well as other *Arachis* species for potential forage use, to date, no new varieties have been released for commercial cultivation (French et al., 1993). The lack of cold tolerance and the plant’s poor adaptation to high soil pH and flooded soil conditions have been major limitations to expanding perennial peanut’s area of adaptation. Currently, Dr. Mimi Williams, Dr. Ken Quesenberry, and co-workers at the University of Florida, USDA-ARS, USDA-NRCS, and Fort Valley State University, are collecting new *A. glabrata*, *A. pintoii*, and other *Arachis* species from southern Brazil, Paraguay, and northern Argentina. The renewed activities in germplasm collection will hopefully identify new plant material, better suited to colder climates and adverse soil conditions, and assist in expanding perennial peanut acreage in the southern U.S.A.

Disease and Insect Resistance

The remarkable adaptation of perennial peanut to the southern Coastal Plain and peninsular Florida has to do with the lack of diseases and insect problems associated with its cultivation. Perennial peanut has good resistance to early (*Cercospora arachidicola*) and late leaf spot (*Cercosporidium personatum*), and peanut stripe and mosaic virus diseases (Prine et al. 1986a). There have been other minor leaf spot occurrences by *Stemphylium* sp. and *Leptosphaerulina* sp., but no serious losses were reported (French et al., 1993). Recently, peanut stunt virus has caused some yield reduction in production fields (Blount et al., 2002).

Plant parasitic nematodes, like the peanut root-knot nematode (*Meloidogyne arenaria*), southern root-knot (*M. inconita*), and javanese root-knot nematode (*M. javanica*), do not present much of a concern to the perennial peanut (Baltensperger et al., 1986). There has been some interest in transferring nematode resistance from perennial into conventional peanut, but no success has been made to date with that objective.

There has been a report of a fungal infection of cotton root rot on perennial peanut in Texas (Barnes, 1990). No known cases of that disease on perennial peanut have been reported in Florida. A few other diseases have been isolated from perennial peanuts and these include *Rhizoctonia*, *Fusarium* sp., and *Pythium* sp., but no serious damage from any of these disease organisms has been reported (French et al. 1993).

While few disease problems or insect problems have been associated with perennial peanut, it may be due to the relatively few acres of perennial peanut presently grown in the southeastern U.S. Disease occurrence may increase with the growing popularity of perennial peanut and future widespread cultivation.

Establishment

Traditional methods of rhizoma perennial peanut (RPP) establishment involve laying fragmented mats of sprigged rhizomes in rows at various depths and row spacing on prepared seedbeds (Adjei and Prine, 1976). These methods require more than two years for a complete field cover, limiting the widespread use of an otherwise excellent forage crop. But the slow establishment handicap is about to change. A recent study at UF/IFAS evaluated all possible combinations of three planting methods and two rhizome planting rates on the spread of four rhizoma peanut entries: Ecoturf, Florigraze, and two experimentals (PI 262826 and PI 262833). After the preparation of a clean seedbed, the following planting methods were studied in 2004 and 2005 on separate sites: 1) broadcast separated rhizomes followed by light disking and then rolling; 2) broadcast separated rhizomes followed by crimping into the seedbed and then rolling; and 3) plant separated rhizomes in 6"-furrows of 2-ft spacing followed by rolling. Separated rhizomes were planted either at 1,500 or 3,000 lb per acre. Ground cover of RPP was estimated monthly after the February planting. The spread of RPP was affected independently by planting method and peanut entry for the first four months in 2004 and through July of 2005. Plants that were established using crimp and roll method generally had greater percentage ground cover with leaves than the row and roll method through June. However, by July (five months after planting) very little differences

were noticed among planting methods with all treatment combinations providing better than 90% ground cover. There was an indication that Florigraze and one of the experimental accessions established a bit faster than Ecoturf initially (through May). The higher planting rate always provided greater vegetative spread of RPP than the lower planting rate for the disk and roll and the crimp and roll methods through July but not for the row and roll method. At five months after planting, all planting methods, RPP entries, and planting rates provided between 90% and 100% ground cover with leaves. This study has shown that rhizoma perennial peanuts can be successfully established on clean seedbed within one year in Florida if rhizome mats are separated into strands of rhizomes before planting.

References

- Adjei, M.B., and G.M. Prine. 1976. Establishment of perennial peanuts (*Arachis glabrata* Benth). Soil and Crop Sci. Soc. Proc. 35:50-53.
- Baltensperger, D.D., G.M. Prine and R.A. Dunn. 1986. Root-knot nematode resistance in *Arachis glabrata*. Peanut Sci. 13:78-80.
- Barnes, L.W. 1990. Diagnostic report on cotton root rot, *Phymatotrichum omnivorum* in Arbrook rhizoma peanut. Texas Plant Disease Laboratory, College Station, TX, USA.
- Blickensderfer, C.B. H.J. Haynsworth and R.D. Roush. 1964. Wild peanut is promising forage legume for Florida. Crops Soils 17:19-20.
- Blount, A.R., Pittman, R.N, Smith, B.A., Morgan, R. N., Dankers, W., Sprenkel, R.K., Momol, M.T. 2002. First Report of Peanut Stunt Virus in Perennial Peanut in North Florida and Southern Georgia. Plant Disease 86:326.
- Conway, T.H. and G.E. Ritchey. 1949. A report of plant species under test at Gainesville, 1914-1949. Final report to USDA Division of Forage Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering. P. 274.

- French, E.C., G.M. Prine, W.R. Ocumpaugh, and R.W. Rice. 1994. Regional experience with forage *Arachis* in the United States. pp. 169-186. In: P.C. Kerridge and B. Hardy (eds.). *Biology and Agronomy of Forage Arachis*. Centro Internat. Agric. Trop. (CIAT).
- Prine, G. M. 1964. Forage possibilities in the genus *Arachis*. *Soil and Crop Sci. Soc. Fla. Proc.* 24:187-196
- Prine, G.M. 1973. Perennial peanuts for forage. *Soil and Crop Sci. Soc. Fla. Proc.* 32:33-35.
- Prine, G. M., L. S. Dunavin, J. E. Moore, and R. D. Roush. 1981. "Florigraze" rhizoma peanut: a perennial forage legume. *Univ. Fla. Coop. Ext Ser. Bull. S-275*. 22 p.
- Prine, G. M., L. S. Dunavin, R.J. Glennon, and R. D. Roush. 1986a. "Arbrook" rhizoma peanut: a perennial forage legume. *Univ. Fla. Coop. Ext Ser. Bull. S-332*. 16 p.
- Prine, G.M., L.S. Dunavin, J.E. Moore and R.D. Roush. 1986b. Registration of "Florigraze" rhizoma peanut. *Crop Sci.* 26:1081-1085.

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