

**TEXAS AGRILIFE RESEARCH STATION
BEEVILLE, TEXAS**

And

**TEXAS A&M UNIVERSITY-KINGSVILLE
CAESAR KLEBERG WILDLIFE RESEARCH INSTITUTE
SOUTH TEXAS NATIVES
KINGSVILLE, TEXAS**

And

**UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
E. "KIKI" DE LA GARZA PLANT MATERIALS CENTER
KINGSVILLE, TEXAS**

**NOTICE OF RELEASE OF HOVERSON GERMPLASM
DEER PEA VETCH SELECTED PLANT MATERIAL**

Texas Agrilife Research Station at Beeville, Texas, Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute, *South Texas Natives*, and the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), E."Kika" de la Garza Plant Materials Center announce the release of a selected plant material of deer pea vetch (*Vicia ludoviciana* Nutt.) for the south Texas Ecoregion.

This plant will be referred to as Hoverson Germplasm deer pea vetch, and is released as a selected plant material class of certified seed (natural track). Hoverson Germplasm was tested under the identification name of "Hoverson". Seed of Hoverson Germplasm deer pea vetch will be identified by USDA NRCS accession number 9109630.

This alternative release procedure is justified because there are no existing Texas commercial sources of tested and adapted deer pea vetch. The potential for immediate use is high, especially for upland wildlife plantings, range seeding mixes, and cool season cover crops.

A. Proposed Variety Name and Temporary Designation:

HOVERSON GERMPLASM DEER PEA VETCH

B. Family, kind, genus and species:

Family: Fabaceae

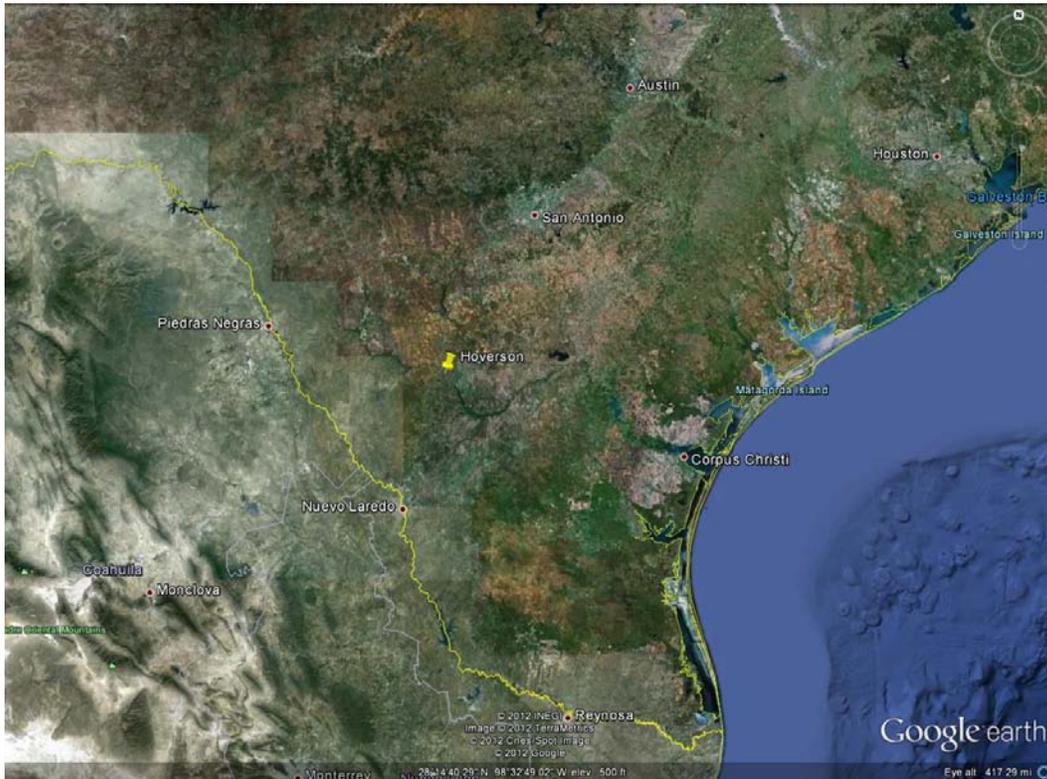
Kind: Deer pea vetch

Genus and species: *Vicia ludoviciana* Nutt.

C. Origin and breeding history of the variety:

Collection Site Information: Hoverson Germplasm was collected by Dr. Richard Hoverson in 1998 from native plants located on the Eddie Knight property, in LaSalle County, Texas (Fig 1). The soils series of the collection site was Sacahuista clay.

Figure 1. Location of collection site of Hoverson Germplasm.



Breeding history: Plants evaluated in trials were grown from the original seed collection or from seed grown in isolation from others of the same species. No intentional breeding, selection, or genetic manipulation has been carried out on this release.

D. Objective description of the variety:

Description: Hoverson Germplasm deer pea vetch is a glabrous or pubescent winter annual legume; stems are decumbent or climbing 2-10 dm. long; leaves 3-9 cm. long, with rachis terminating in a usually forked tendril; leaflets 6 to 12, linear-oblong or elliptic to broadly elliptic, 6-25 mm long, rounded or emarginated at apex; stipules semisagittate, usually more or less unequal; peduncles shorter than to exceeding the leaves, 2-4 cm. long; flowers solitary or 2 to 12 in a lax or dense raceme; corolla lavender-blue, 5-8 mm. long the folded banner 1.5-4 mm. high; calyx somewhat pilose, the tube 1-2 mm. long the teeth unequal, the lower teeth subulate and equaling the tube, the upper teeth shorter and broader; pods flat, glabrous, oblong, oblique at both ends, 2-3 cm. long, 4 to 8 seeded. Seed is spherical in shape very hard and light brown in color with dark brown markings (Figure 2). Seed is 1.8 to 2.1 mm in length and 1.7-2 mm wide

often dehiscing at maturity. There is an average of 65,850 seeds per pound. Deer pea vetch is widespread in the eastern half of the United States (Correll and Johnston, 1970).

Figure 2. Mature seed of Hoverson Germplasm deer pea vetch.



Potential uses: Hoverson Germplasm deer pea vetch is recommended for upland wildlife plantings, range seed mixes, and as a cool season legume cover crop. Deer pea vetch leaves and seed are eaten by white-tailed deer, cattle, bobwhite quail, and Rio Grande turkeys (Everitt et al. 1999). Hoverson Germplasm is a winter annual legume that can be used for native food plot plantings, and for use in efforts to diversify stands of dense grass for the purpose of improving wildlife habitat. It has shown good competitive ability with a number of introduced forage grasses in south Texas.

E. Evidence

Method of Breeding and Selection

Initial Evaluation

Evaluation plantings were first made at the Texas Agricultural Research Station at Beeville in the winter of 1998-99. At that time there were 3 collections of the species planted from greenhouse grown seedlings in replicated plots at Beeville. The other two collections were from a single natural stand in Pasture 3 on the Beeville Station. The Beeville collection resulted in both a green-seeded and a black-seeded type seed. For this evaluation, the two seed types were separated and grown as two separate plots. This initial evaluation did not include any detailed note taking, but was done to try to evaluate the potential of this plant for use in pasture and range

plantings. The Beeville collection did not breed true for seed color, and after a couple years of evaluation, it was decided that the Hoverson collection was the superior line, and that the species had potential for range and pasture seedings. All future work was done with the Hoverson collection only. In the winter of 2001-02 a seed increase of Hoverson Germplasm was planted at Beeville and in 2002-03, 2 acres were planted for pre-commercial seed increase at Rancho Blanco near Laredo, TX. This seeding near Laredo was irrigated, sprayed for weed control and harvested with a Horwood-Bagshaw vacuum harvester. This increase resulted in about 400 lbs of clean seed.

Advanced evaluation

Evaluation plantings were made in Kingsville and Uvalde, Texas in 2007 by personnel from *South Texas Natives* to assess emergence, seed yields, and adaptation of Hoverson Germplasm. Plots were seeded at a rate of 8 lbs pure live seed per acre. Seed was scarified and inoculated prior to seeding. Plantings at Kingsville were fully irrigated and showed outstanding performance (Figure 3a). Seedling emergence and vigor were excellent. Hoverson Germplasm was highly competitive with common cool season weeds and was an excellent seed producer. Three 1-meter square random plots were clipped at maturity to estimate seed yields. Hoverson germplasm produced approximately 700 bulk lbs seed per acre in this planting, with 89% pure live seed. The initial planting at Uvalde was irrigated after planting only. Although relatively dry conditions persisted during the evaluation, Hoverson germplasm emerged, established, and produced seed during the evaluation (Figure 3b). Good competitive ability with common cool season annual weeds was also observed in this planting. Some volunteer emergence had already been noted in the Kingsville plot by October 2008.

Figure 3 a, b. Advanced evaluation plots at Kingsville (l) and Uvalde (r), winter 2007.



Forage production samples were collected from volunteer plants in Kingsville in April 2009 and yielded 685 lbs dry matter with 24% crude protein. Forage production was also evaluated in trials at San Angelo State University, where Hoverson Germplasm was seeded at a rate 25 lbs pure live seed to the acre in 2003 and 2004. In 2003, the germplasm produced 371 lbs dry matter per acre and 375 lbs dry matter per acre in 2004.

Field plantings of Hoverson Germplasm deer pea vetch have documented that it can be successfully used to diversify rangeland seeding mixtures. Hoverson Germplasm deer pea vetch has shown excellent emergence and continued persistence on a variety of soil types across south Texas (Fig. 4, Table 1). In all plantings, Hoverson Germplasm made up less than 15% of the planting mixture. Seeding rates were based on a percentage of the full stand rate of 10-16 pounds per live seed to the acre. These stands were then evaluated by sampling the number of plants in a 1 m² frame. Hoverson Germplasm has proven to be an excellent native alternative to fill the need for a cool season legume with high active germination, good competitive ability, and persistence.

Figure 4. Locations of Hoverson Germplasm field plantings.

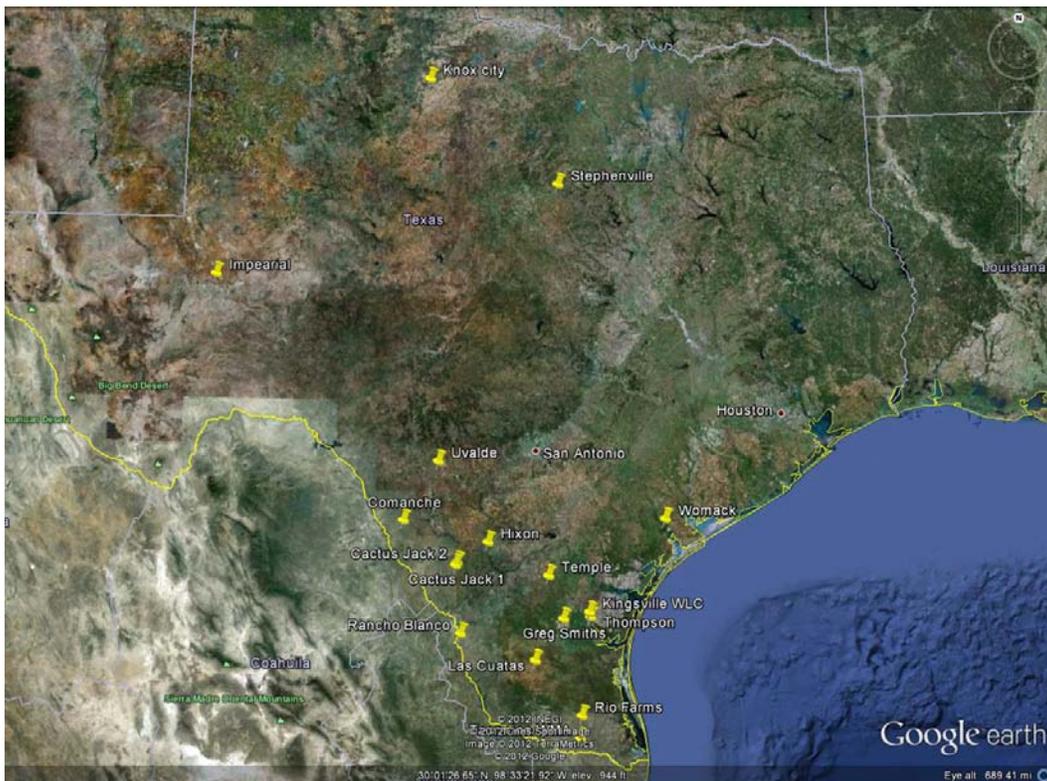


Table 1. Hoverson Germplasm deer pea vetch field planting locations including soil type, year planted, plant density 1 year post planting, and 2nd year reemergence.

Location (nearby town)	Soil Type	Year	Seeding rate (lbs pls/acre)	Plants/ft ² @ 1 yr.	2 nd year persistence
Cactus Jack 1 (Encinal)	Brystal fine sandy loam	2008	1.1	0.18	No
Cactus Jack 2 (Encinal)	Duval fine sandy loam	2008	1.1	0.09	No
Comanche (Carrizo Springs)	El Indio clay loam	2009	1.1	0.15	Yes
Gregg Smith (Premont)	Runge fine sandy loam	2010	0.8	0.00	N/A
Hixon Ranch (Cotulla)	Bookout clay loam	2010	0.9	0.36	Yes
Hixon Ranch (Cotulla)	Bookout clay loam	2010	1.3	0.76	Yes
Hixon Ranch (Cotulla)	Bookout clay loam	2010	2.4	2.94	Yes
Hixon Ranch (Cotulla)	Bookout clay loam	2010	1.2	1.88	Yes
Hixon Ranch (Cotulla)	Bookout clay loam	2010	0.9	1.20	Yes
Hixon Ranch (Cotulla)	Bookout clay loam	2010	1.3	1.50	Yes
Hixon Ranch (Cotulla)	Bookout clay loam	2010	2.4	2.64	Yes
Hixon Ranch (Cotulla)	Bookout clay loam	2010	1.2	3.04	Yes
Imperial	Reakor sandy clay loam	2011	10	N/A	N/A
Kingsville	Clareville clay loam	2011	10	4.10	N/A
Knox City	Altus fine sandy loam	2011	10	0.00	N/A
Taormina WMA (Donna)	Harlingen clay	2008	0.7	0.20	Yes
Las Cuatas (Hebbronville)	Nueces- Sarita sand	2008	1.1	0.01	Yes
Rancho Blanco (Laredo)	La Gloria sandy loam	2008	1.1	0.28	Yes
Rio Farms (Monte Alto)	Delfina fine sandy loam	2008	1.1	0.41	Yes
Stephenville	Windthorst fine sandy loam	2011	10	1.80	Yes
Temple Ranch (Freer)	Alet sandy clay loam	2009	1.1	0.07	Yes
Thompson (Kingsville)	Cranell sandy clay loam	2008	1.0	0.34	Yes
Uvalde	Uvalde sandy clay loam	2011	10	2.10	N/A
Womack (Bloomington)	Fordtran loamy fine sand	2009	1.1	1.32	Yes

Seed Increase

Seed was increased in 2002-03 at Rancho Blanco near Laredo, Texas. This planting produced 200 bulk lbs of seed per acre with 89% pure live seed. This seed was harvested from an irrigated stand where Pursuit® was used at a rate of 4 oz/acre in January to reduce the competition from weed and facilitate the use of a Horwood-Bagshaw vacuum harvester. Seed was also increased in Kingsville in 2008 and produced 550 bulk lbs of seed per acre. The seed was harvested using a Massey Ferguson combine with a grain header.

Deer pea vetch seeds dehisce at maturity making it difficult to mechanically harvest. In the Kingsville evaluation, plants were clipped (simulating swathing) just prior to seed maturity and air dried. After the seed had dried it was tested for active germination, and was found that there was minimal difference in active germination between seed that was harvested ripe or seed that was harvested at maturity. Careful observation is essential to successfully harvest seed of Hoverson Germplasm, as waiting too long can result in significant loss. Harvest needs to occur as soon as 50% of the seed pods change color from green to tan (Fig. 4). This harvest guideline allows for the greatest amount of seed to be harvested while still maintaining seed quality.

Seed can be harvested using a combine with a grain style header. This harvest method will result in both green and mature seed, as well as other high moisture material in the harvested product. Most of the green seed will mature, but care must be taken to insure adequate seed drying procedures are followed to prevent molding and heating of this mixture. Seed harvested with this method is best cleaned by hammer milling to release seed from un-opened pods, then screened using a Clipper seed cleaner.

Figure 5. Mature seed pods of Hoverson Germplasm deer pea vetch.



Un-scarified seed of Hoverson Germplasm averages 44% active germination and 49% hard seed. Scarification for 1 second in a cylindrical scarifier increases active seed germination to 90%.

Seed has also been harvested from the ground using a vacuum harvester; however this method results in large amounts of inert matter (soil and rocks) that must be transported to where the seed will be cleaned. Whereas vacuum harvesting may not be the most desirable, it does permit a good seed harvest when the alternative harvest methods are not possible due to weather issues. Rocks, weed seeds, and relatively large inert matter have been successfully cleaned from seed using a gravity table.

Seed storage life of Hoverson Germplasm is unknown, however seed kept in cold storage at Beeville from May of 2003 until June of 2011 showed little to no decline in viability. The cold storage facility at Beeville was designed to keep the conditions near 50 degrees F and 50% relative humidity.

Inoculant for Hoverson Germplasm deer pea vetch was obtained in spring 2007 by collecting root nodules from native populations of deer pea vetch in the same area of the original collection.

Nodules were sent to Dr. Tom Wacek of Plant Probiotics for isolation, and increase. Test plantings of the 2007 isolate were made in the fall of 2007, and plants expressed excellent nodulation, vigor and performance with the use of this inoculum at two separate locations. Several plantings were attempted between the fall of 2004 and 2007 with poor success. This poor performance is attributed to the unavailability of an effective inoculum. Evaluations conducted between 1998 and 2003 were done with an earlier inoculant isolation by Dr. Tom Wacek, and performed well. Inoculant will be available through Dr. Wacek for increase and inoculation of commercial seed.

F. Area of adaptation

Deer pea vetch is found throughout the state of Texas, however trial plantings of Hoverson Germplasm suggest best performance will be in central and south Texas, including the Rio Grande Plains, Gulf Prairies and Marshes, and the Edwards Plateau Ecoregions of Texas. Acceptable performance in adjacent ecoregions is possible, but has not been tested.

G. Procedure for maintaining stock classes of seed

Breeder seed will be produced and maintained by *South Texas Natives*. Additionally, breeder seed may also be produced by approved seed dealers under the supervision of *South Texas Natives*.

H. Description of how the variety is to be constituted, etc.

Hoverson Germplasm deer pea vetch will be released as Selected Texas Native Ecotype with the following classes of seed: breeder (G0) made up of seed grown from the seed produced under the supervision of STN or TARS-Beeville personnel in isolation from other plants of the same species. Foundation (G1) seed grown from planting of breeder seed, and certified (G2) seed that is grown from plantings of foundation seed. Increase using certified seed is prohibited.

I. Additional restrictions, etc.

Foundation and certified seed fields have a 5 year production limit.

Will application be made to the Plant Variety Protection Office? YES ___ NO X

If yes will the application specify that the variety be sold by variety name only as a class of certified seed? YES ___ NO ___

Royalty distribution: Distribution of royalties and percentages to be determined at a later time.

Ecological Considerations and evaluation: An Environmental Evaluation of Plant Materials Releases was completed using guidelines established by NRCS, and the best available information for this species. Results of this evaluation determined that Hoverson Germplasm deer pea vetch was suitable for release based on the criterion contained in this document. This conclusion is mainly due to the fact that deer pea vetch is a naturally occurring species in Texas

and planting it would therefore not constitute an introduction of an exotic species into local ecosystems. Any negative impacts on other native plant species would likely be minimal to non-existent. Also, release of this species will make available a native winter annual legume species for rangeland plantings, will provide a good seed source to upland avian wildlife species, provide for a cool season cover crop, and provide unknown benefits by maintaining and contributing habitat that harbors beneficial insects and butterflies.

Conservation use: Hoverson Germplasm deer pea vetch will provide a native legume species for rangeland planting and wildlife habitat improvement.

Availability of Plant Material: Breeder seed will be maintained by *South Texas Natives*, Kingsville, Texas.

References:

Correll, D. S., and M. C. Johnston. 1970. Manual of the vascular plants of Texas. Texas Research Foundation, Renner, TX.

Everitt, H.J., D.L. Drawe, and R.L. Lonard. 1999. Field Guide to the Broad-Leaved Herbaceous Plants of South Texas. Texas Tech University Press, Pg. 145.

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**MARKETING PLAN:
HOVERSON GERMPLASM DEER PEA VETCH**

October 2011-Distributed G0 seed for commercial production to Douglass King Seed Company and Pogue Agri Partners.

July 2012-Complete release document and submit to collaborators for review and approval.

Autumn 2012/Spring 2013-Announce release once seed is commercially available and release document has been approved, via STN Website, STN newsletter, STN hard copy newsletter, and presentations.

**SEED AVAILABILITY:
HOVERSON GERMPLASM DEER PEA VETCH**

As of March 1, 2012, +/- 90 PLS lbs of G0 seed of Hoverson Germplasm is available for distribution to commercial growers. Breeder seed of the release has already been distributed to Douglass King Seed Company and Pogue Agri Partners for production and increase. Additional seed is in cold storage at the E. "Kika" de la Garza Plant Materials Center and South Texas Natives Farm Facility.

**SEED PRODUCTION ESTIMATE/PLAN:
HOVERSON GERMPLASM DEER PEA VETCH**

A 0.25 acre plot of deer pea vetch is established at the *South Texas Natives* Farm in Kingsville, TX. This stand was originally established using transplants grown using seed from the original population increase at Laredo, TX. Under irrigation, this plot volunteers and produced approximately 50 lbs PLS annually. Additional seed increases will be planted as needed to provide requested amounts of breeder seed to interested growers. Hoverson Germplasm is easily established by direct seeding for increase, and yields large quantities of seed within the establishment year under irrigation.

Figure 6. Representative plants of Hoverson Germplasm deer pea vetch in flower.



Figure 7. Hoverson Germplasm deer pea vetch with immature seed pods.



Signatures for release of:

HOVERSON GERMPLASM DEER PEA VETCH

Vicia ludoviciana Nutt.

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