



Ministerio de Agroindustria
Presidencia de la Nación

MEJORA GENETICA (BREEDING) DE MANI. DISPONIBILIDAD Y ELECCION DE VARIEDADES.

2° CURSO
PRODUCCIÓN
DE MANÍ - 2017

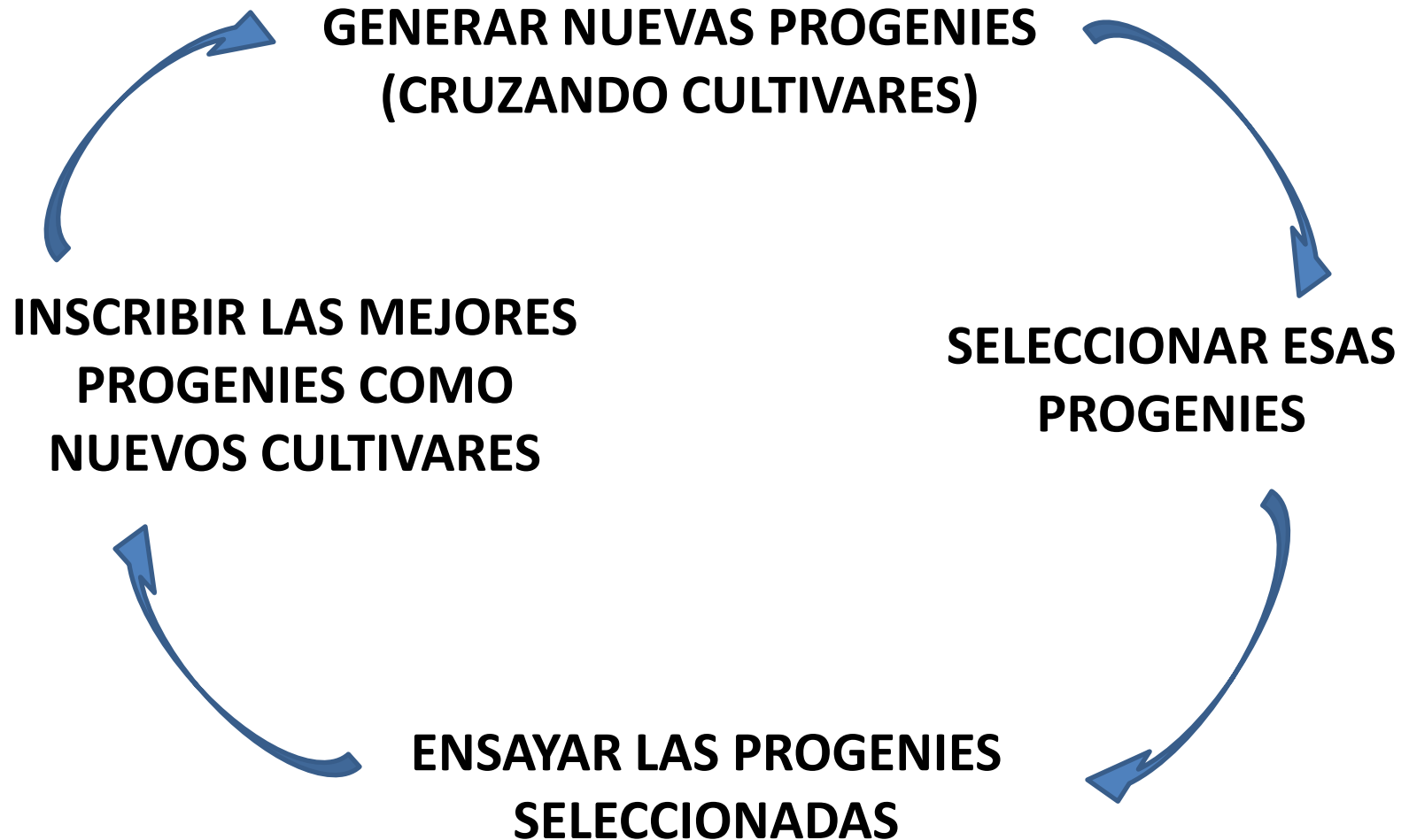


Jorge Baldessari, PhD
Mejorador de Maní
INTA Manfredi

MEJORA GENETICA VEGETAL (BREEDING)

- MANIPULACIÓN A VEGETALES PARA CREAR GENOTIPOS Y FENOTIPOS PARA PROPÓSITOS ESPECÍFICOS, SIGUIENDO LEYES DE LA GENÉTICA (SLEPER & POEHLMAN).
- PROCESO CÍCLICO DE IDENTIFICAR NUEVA VARIACION (GENES), CRUZAR, SELECCIONAR Y FIJAR GENES FAVORABLES (KNIGHT).
- *AL MEJORAR SE USA GENÉTICA, ESTADÍSTICA, FISIOLOGÍA, PATOLOGÍA, ENTOMOLOGÍA, ETC.*

MEJORA GENETICA: PROCESO CICLICO Y CONTINUO



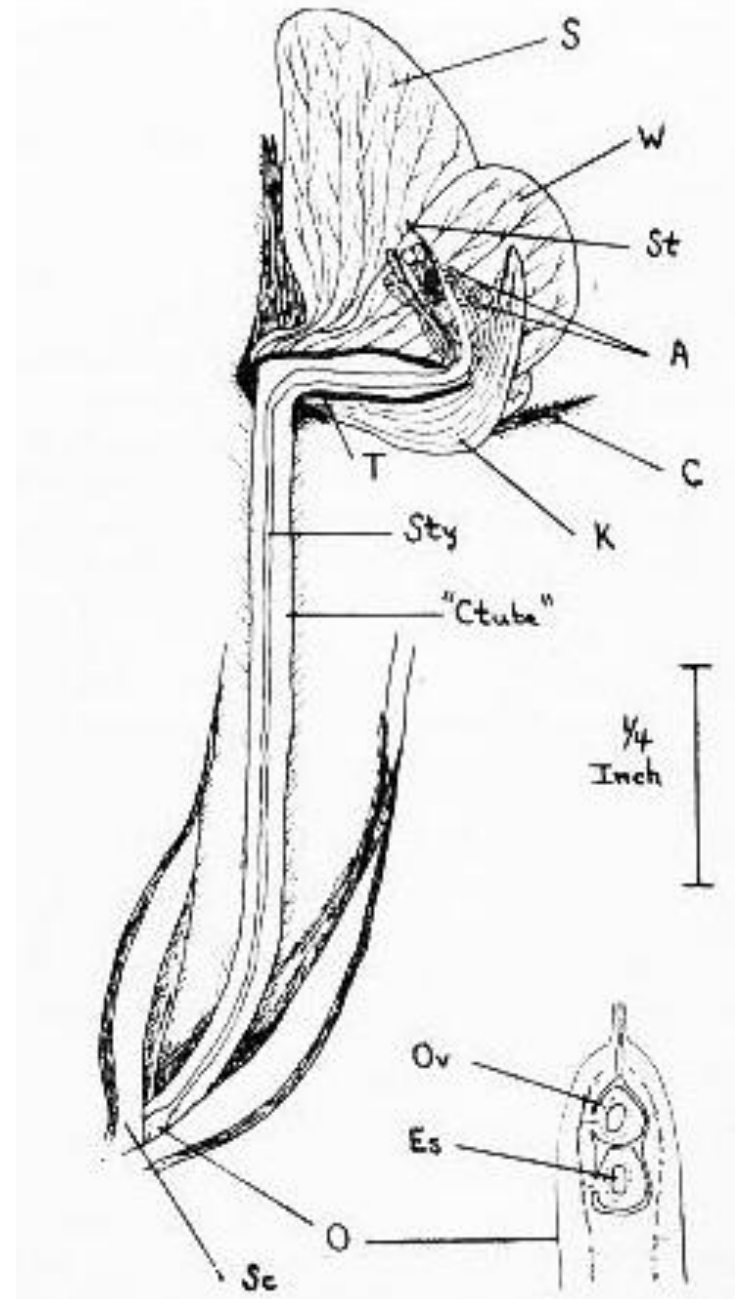
COMO SE INICIA EL PROCESO DE MEJORA?

- EL MANI ES CLEISTOGAMO: POLINIZACION SIN ABRIR LA FLOR (AUN BAJO TIERRA).
- EN EL EXTERIOR HAN DETECTADO GRADOS VARIABLES DE CASMOGAMIA (HASTA 20%) POR ABEJAS.
- EN MANFREDI NUNCA HEMOS DETECTADO CASMOGAMIA.
- LA VARIABILIDAD NECESARIA PARA INICIAR MEJORA GENETICA SE LOGRA HACIENDO CRUZAMIENTOS ARTIFICIALES.
- EL ESQUEMA MAS USADO ES CRUZAR DOS PADRES CON CARACTERES QUE UNO QUIERE REUNIR EN UN SOLO INDIVIDUO.
 - DESEO UN RUNNER QUE SEA RENDIDOR Y TENGA GRANO RUNNER ALTO OLEICO

CRUZAMIENTO Y SELECCION

- EMASCULACION
- POLINIZACION
- COSECHA DEL MATERIAL HIBRIDO
- CULTIVO DE HIBRIDOS
- CONFIRMACION DEL CARACTER HIBRIDO
- PROCESO DE SELECCION DEL MATERIAL SEGREGANTE

PARTES DE
UNA FLOR DE
MANI (VISTA
LATERAL).
SMITH 1950



INFLORESCENCIA DEL MANI: ESPIGA PAUCIFLORA (1-5 FLORA)

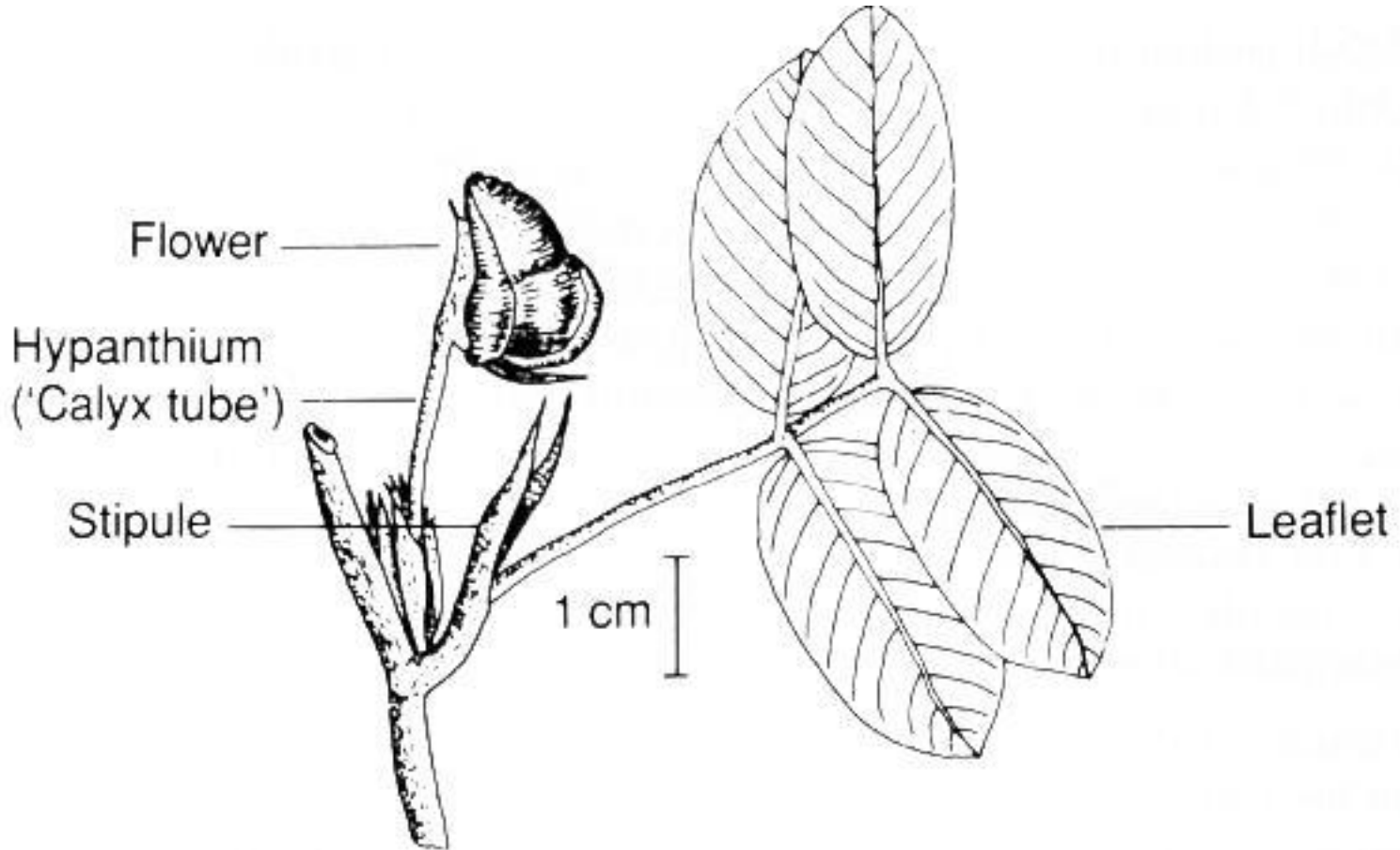


Figure 3.4 Inflorescence.

SMITH 1950

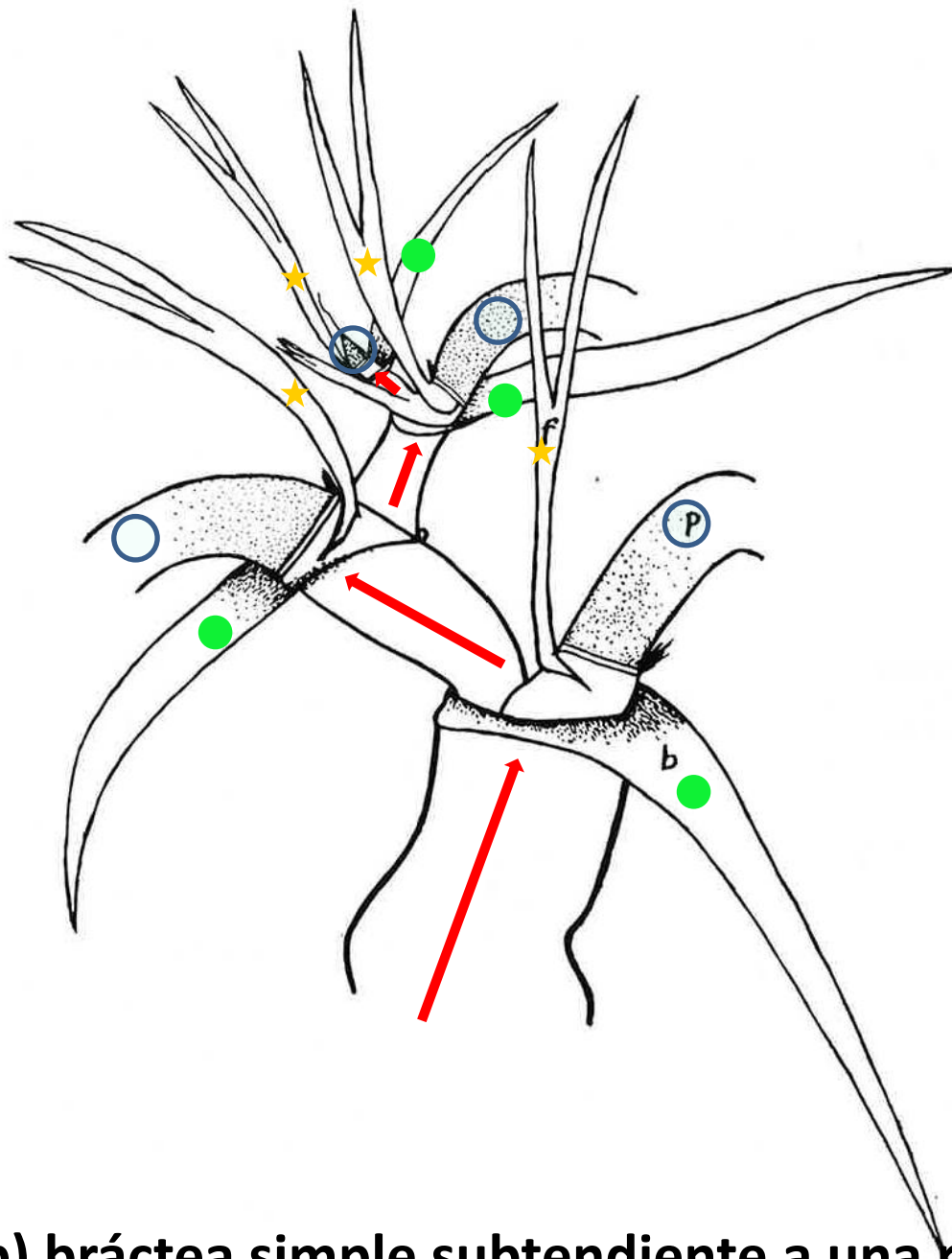
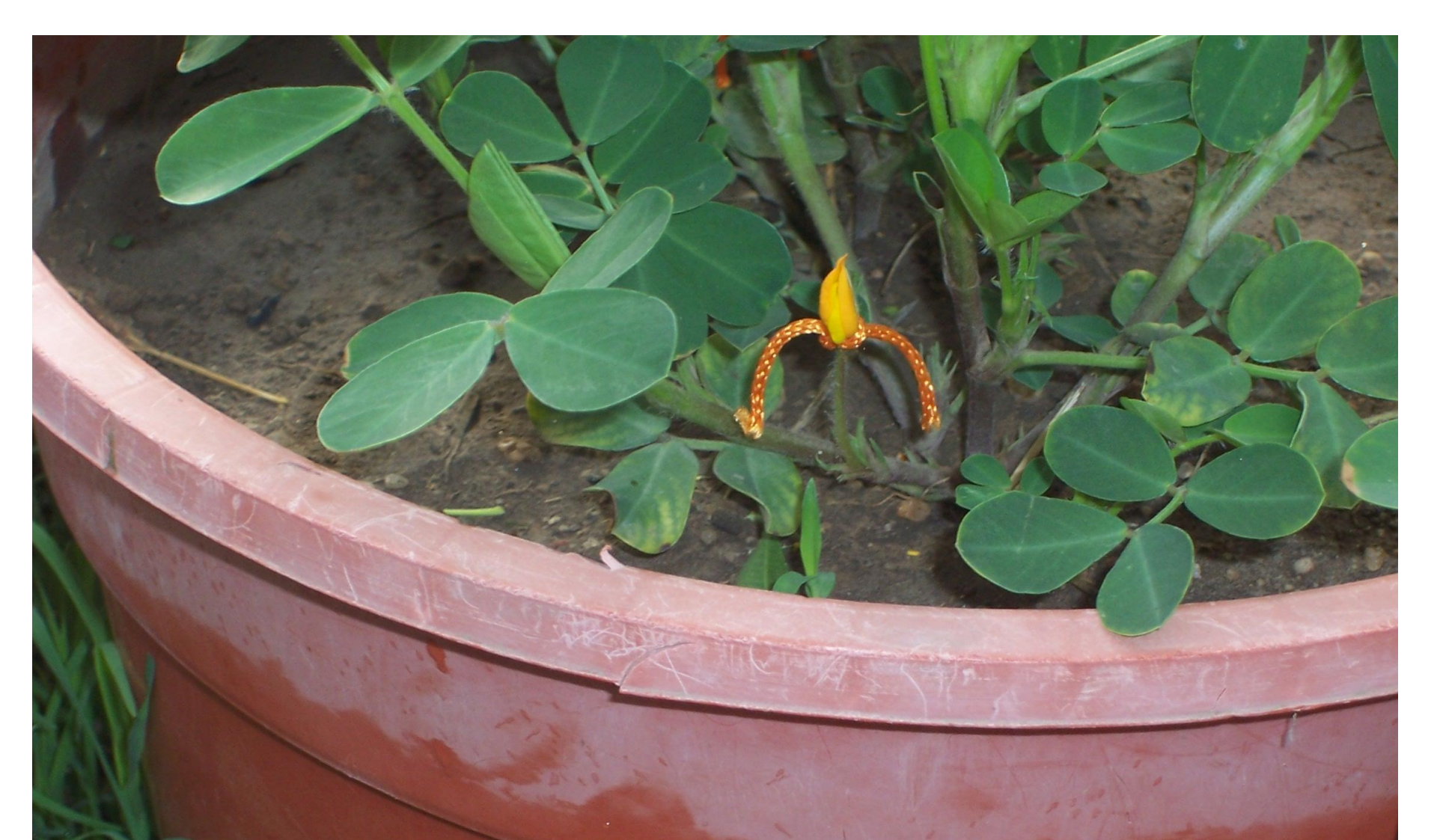


DIAGRAMA DE UNA
INFLORESCENCIA CON
FRUTO EN
DESARROLLO EN LOS
PRIMEROS 3 NUDOS
(GREGORY ET AL.
1951)

b) bráctea simple subtendiente a una rama floral; f) bráctea bífida subtendiente a una flor (ya transformada en clavo); p) clavo



**FLOR EMASCULADA LISTA PARA
POLINIZAR**



**FLORES EMASCULADAS LISTAS PARA
POLINIZAR**



POLINIZANDO LA FLOR EMASCULADA

MESAS DE CRUZAMIENTO



MESA DE CRUZAMIENTO



MESA DE CRUZAMIENTO

Etapa 1: Cruzamiento

- Se aparean dos padres para generar individuos que reúnan las virtudes presentes en ambos progenitores (rendimiento + calidad + resistencia)



CONFIRMACION DEL CARACTER HIBRIDO



CONFIRMACION DEL CARACTER HIBRIDO



CONFIRMACION DEL CARACTER HIBRIDO



06JOR-Citra ♦ 06JOR- GV Plant Number
F2 115 ♦ PLOT: 223 7

06JOR-Citra ♦ 06JOR- GV Plant Number
F2 115 ♦ PLOT: 223 3

OBJETIVO DE LOS CRUZAMIENTOS

REUNIR EN UN MISMO INDIVIDUO CARACTERISTICAS DESEABLES PROVENIENTES DE DOS O MAS PADRES

UNMENTIONABLE 1
(RENDIMIENTO)

UNDISCLOSED 1
(ALTO OLEICO)

```
graph TD; A[UNMENTIONABLE 1  
(RENDIMIENTO)] --> C[ELPOSTA  
(RENDIDOR y AO)]; B[UNDISCLOSED 1  
(ALTO OLEICO)] --> C;
```

ELPOSTA
(RENDIDOR y AO)

LA DURA REALIDAD

PADRE	RENDIMIENTO	ALTO OLEICO	VIRUELA	PORTE	CASCARA	CINTURA	TEGUMENTO
A	+	-	+	-	-	-	-
B	-	+	-	+	+	-	+
C	-	+	+	--	+	+	+

PARECE UNA IDEA SIMPLE...QUE PODRIA SALIR MAL?

- PROBABILIDAD DE ENCONTRAR UN INDIVIDUO F2 CON EL GENOTIPO BUSCADO (PARA GENES QUE SEGREGAN INDEPENDIENTEMENTE)
 - a) $1/X^n * 1/X^n$ (DONDE X=NUMERO DE ALELOS Y n=NUMERO DE GENES)
 - b) $1/2^2 * 1/2^2 = 1/4 * 1/4 \rightarrow 1/16$ INDIVIDUO CON EL GENOTIPO QUE BUSCO
 - c) $1/3^5 * 1/3^5 = 1/243 * 1/243 \rightarrow 1/59000$ INDIVIDUO CON EL GENOTIPO QUE BUSCO
- EL BREEDING ES UN JUEGO DE PROBABILIDADES (Y CASI TAN MALAS COMO LA LOTERIA)

EL INDIVIDUO BUSCADO

1. DETECCION DEL INDIVIDUO: DURANTE EL PROCESO DE MEJORA
2. CONFIRMACION DE VIRTUDES: CARACTERES DE POCA HEREDABILIDAD
3. DETECCION DE POSIBLES DEFECTOS: MANIPULACION DE AMBIENTES VS OCURRENCIA ALEATORIA

LA MEJORA GENETICA TOMA TIEMPO PARA SOLUCIONAR PROBLEMAS

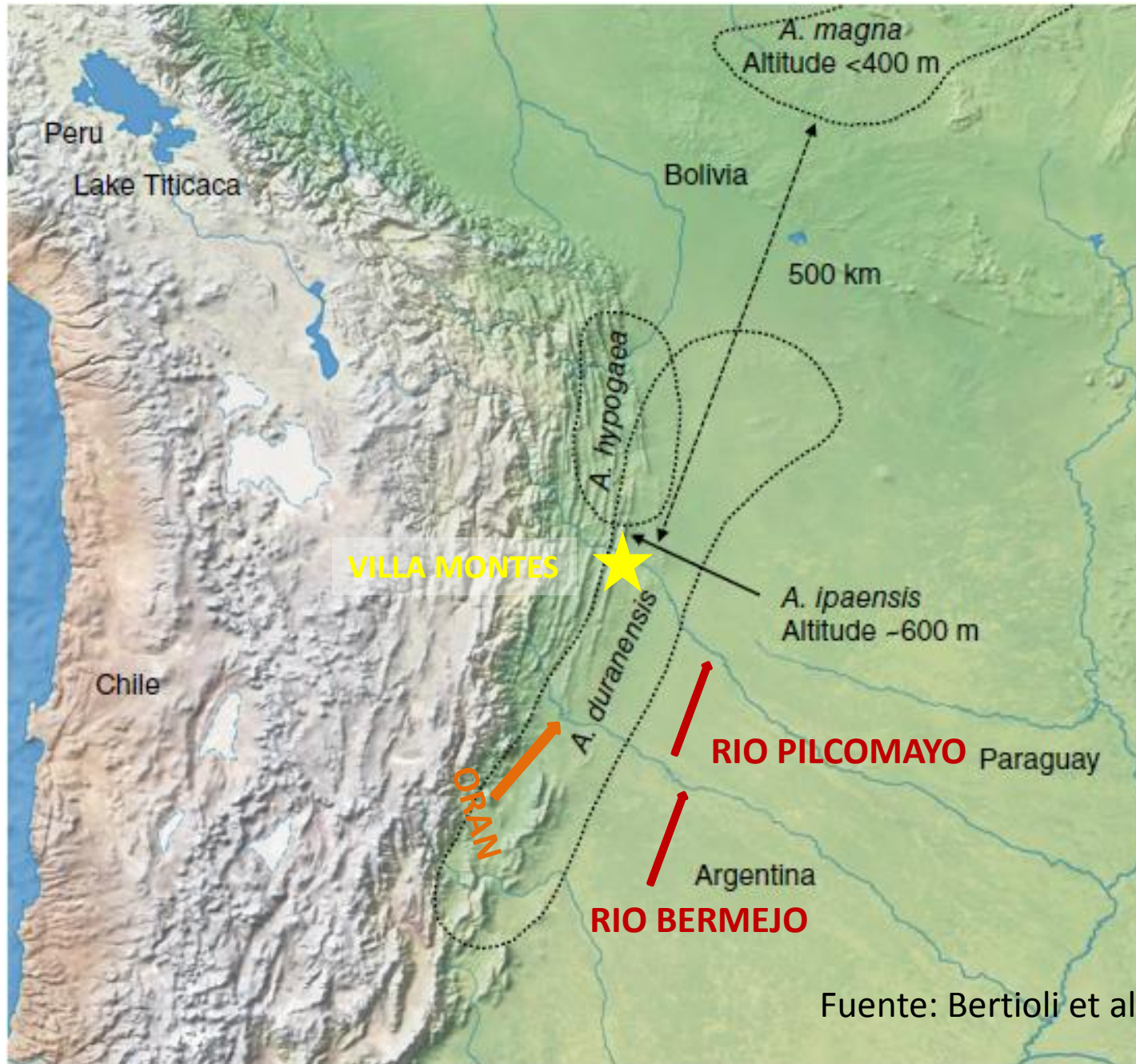
- EL APORTE DE LA MEJORA GENETICA A LA SOLUCION DE UN PROBLEMA PUEDE TOMAR MUCHOS AÑOS, INCLUSO DECADAS (*Sclerotinia*, *Sclerotium*, *Viruela*, *Thecaphora*)
- LA DETECCION DEL PROBLEMA DEBE SER RÁPIDA PARA INICIAR LA MEJORA LO ANTES POSIBLE

LOS PROGRAMAS DE MEJORA GENETICA DEBEN “ENFOCARSE”

- COMO LA MG ES LENTA Y COSTOSA, Y LA CAPACIDAD DE UN PROGRAMA DE MEJORA GENETICA ES LIMITADA...
 - LOS OBJETIVOS DEBEN SER ESTABLECIDOS BASÁNDOSE EN:
 - IMPORTANCIA DEL PROBLEMA
 - POSIBILIDAD DE “SOLUCIONARLO” (M-V-R) :
 - MÉTODOS PUESTOS A PUNTO PARA EVALUAR EL CARÁCTER
 - EXISTENCIA DE VARIABILIDAD GENÉTICA
 - RECURSOS (RRHH, INSTRUMENTAL, \$\$\$)

ORIGEN DEL MANI CULTIVADO

- ALOTETRAPLOIDE SEGMENTAL: ALGUNOS MULTIVALENTES CAUSAN DISTORSION DE PROPORCIONES DE SEGREGACION DIPLOIDE
- CAMINO CONSENSO: A. IPAËNSIS + A. DURANENSIS = HIBRIDO ESTERIL + DUPLICACION CROMOSOMICA = A. MONTICOLA + SELECCION ANTROPICA = A. HYPOGAEA
- A. MONTICOLA PUDO HABERSE FORMADO DOS VECES, CADA UNA CON UN PADRE DURANENSIS DIFERENTE, DANDO LUGAR A LAS 2 SUBESPECIES (HYPOGAEA Y FASTIGIATA)



Fuente: Bertoli et al. 2016

Figure 8 The approximate known distributions of *A. duranensis* and *A. magna*, the location of the single known occurrence of *A. ipaensis* and the center of diversity for the most primitive type of cultivated peanut, *A. hypogaea* subsp. *hypogaea* var. *hypogaea*. *A. ipaensis* is only known to be from a single location and is biologically conspecific with *A. magna*, which occurs far to the north and at lower altitude. The isolated occurrence and estimated divergence of the *A. ipaensis* genome from the B genome of *A. hypogaea*, only ~9,400 years ago, indicate that *A. ipaensis* was probably taken to its present location from the north by prehistoric inhabitants of the region. *A. hypogaea* was formed by hybridization of *A. ipaensis* with *A. duranensis* and polyploidization. The figure was generated using Natural Earth.

HIBRIDOS INTERESPECIFICOS

- LOS PRIMEROS LOS OBTUVIERON LOS GREGORY EN NORTH CAROLINA
- EL MAYOR CREADOR TODAVIA ES CHARLES SIMPSON EN TAMU
- OTROS GRANDES PRODUCTORES SON CENARGEM E ICRISAT
- EN ARACHIS, SON RECONOCIDOS LOS GENOMAS A, B, D, E, F, K y P (Y LA MAYORIA YA INTEGRAN ALGUN HIBRIDO INTERESPECIFICO)

TRATANDO DE TRANSFERIR GENES UTILES DESDE MANIES SILVESTRES (STEPHENVILLE, TX)



REQUERIMIENTOS DEL BREEDING COMERCIAL

1. LOTE/S: ACORDE A...
 - a) LA CANTIDAD DE INDIVIDUOS QUE PUEDAS SELECCIONAR
 - b) CUANTOS ENSAYOS LOCALES TENGAS

COMPARACION USA-INTA
2. PERSONAL DE CAMPO:
 - a) CANTIDAD DE INDIVIDUOS SEMBRADOS/SELECCIONADOS
 - b) NIVEL DE MECANIZACION USADO
3. MEJORADOR: 1 RINDE MUCHAS HA 😊
4. MAQUINARIA:
 - a) GENERAL
 - b) ESPECIFICA

CRIADERO DE MANÍ DEL INTA MANFREDI



EQUIPAMIENTO FABRICADO AD-HOC PARA MANFREDI



COSECHADORA AUTOPROPULSADA PARA ENSAYOS (TIFTON, GA)



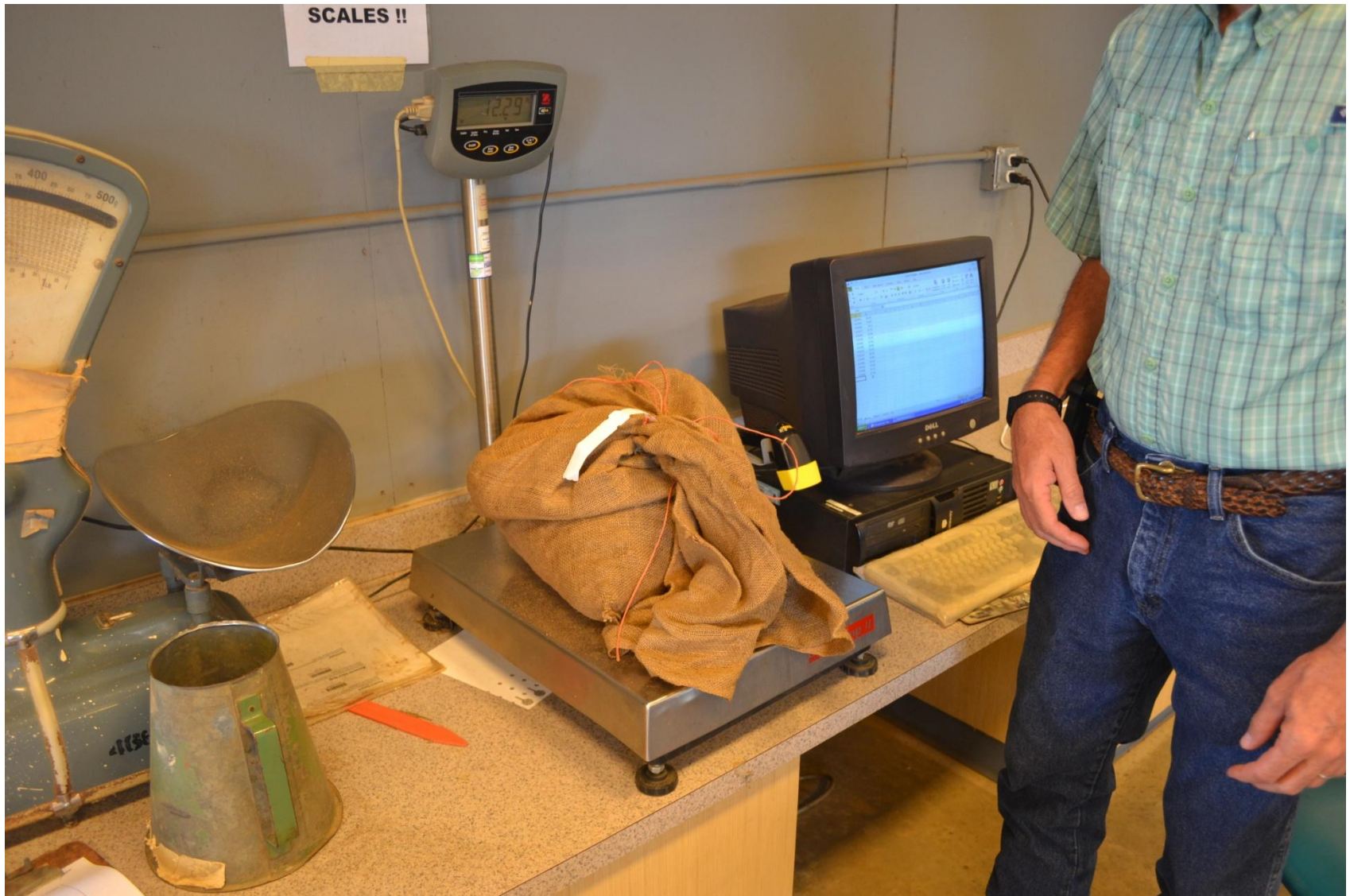
SEPARANDO SEMILLAS POR CONTENIDO DE OLEICO (MANFREDI)



SEPARANDO SEMILLAS POR CONTENIDO DE OLEICO (MARIANNA, FL)



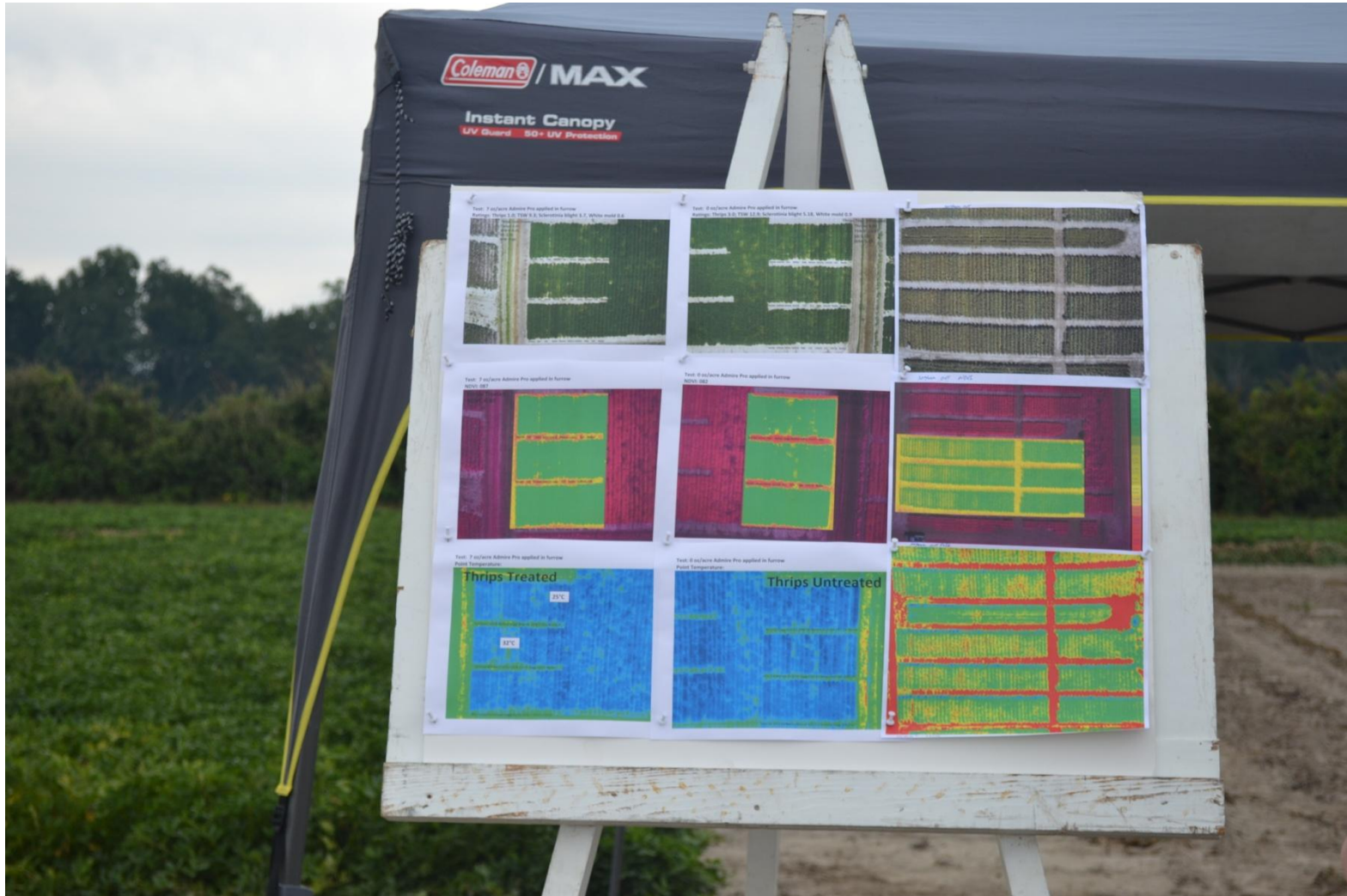
PESANDO ENSAYOS Y REGISTRANDO VIA RS-232 (MARIANNA, FL)



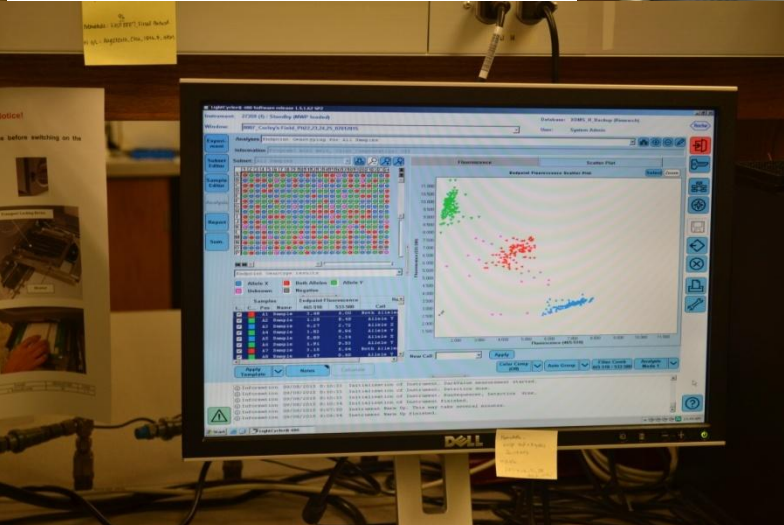
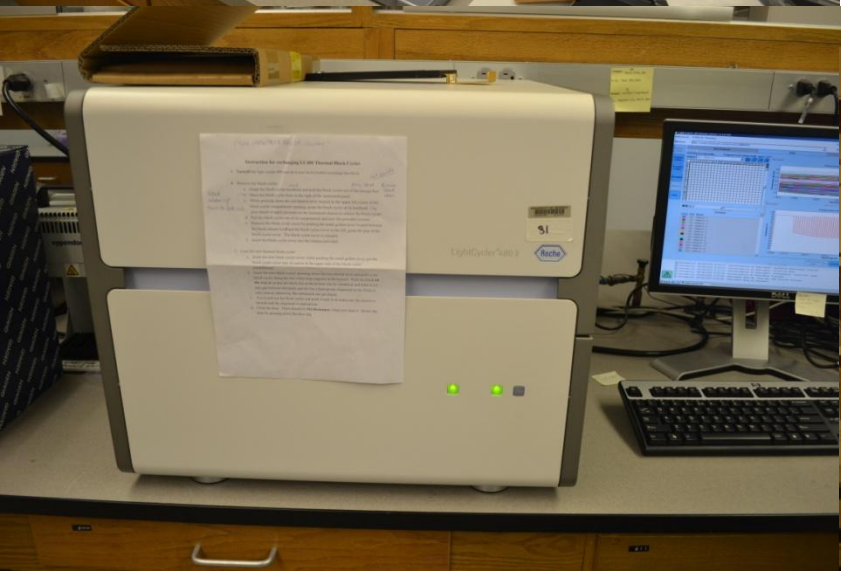
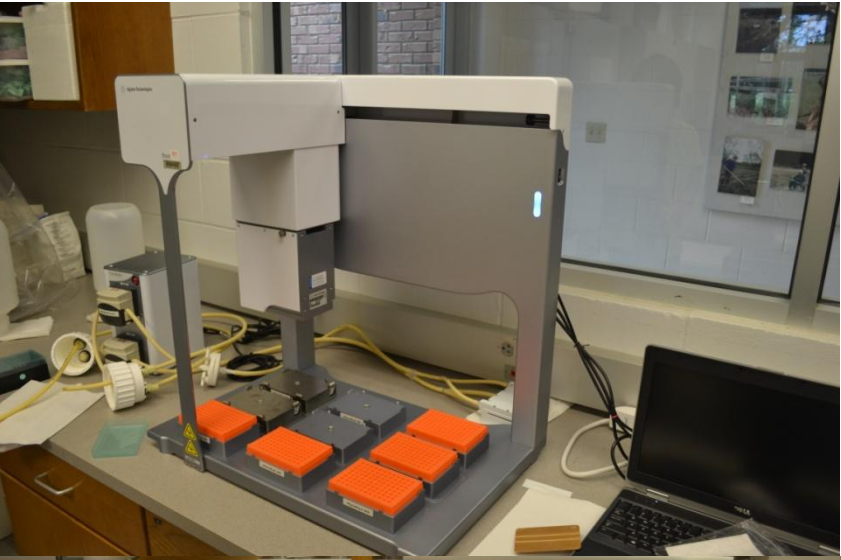
HIDROLAVADO PARA REMOVER EXOCARPO Y VER MADUREZ (MARIANNA, FL)



RECOGIENDO INFORMACION DE ENSAYOS VIA IMAGENES TERMICAS DE UN DRONE (TIDEWATER A.R.E.C., VA)



EQUIPAMIENTO BIOTECNOLOGICO (TIFTON, GA)

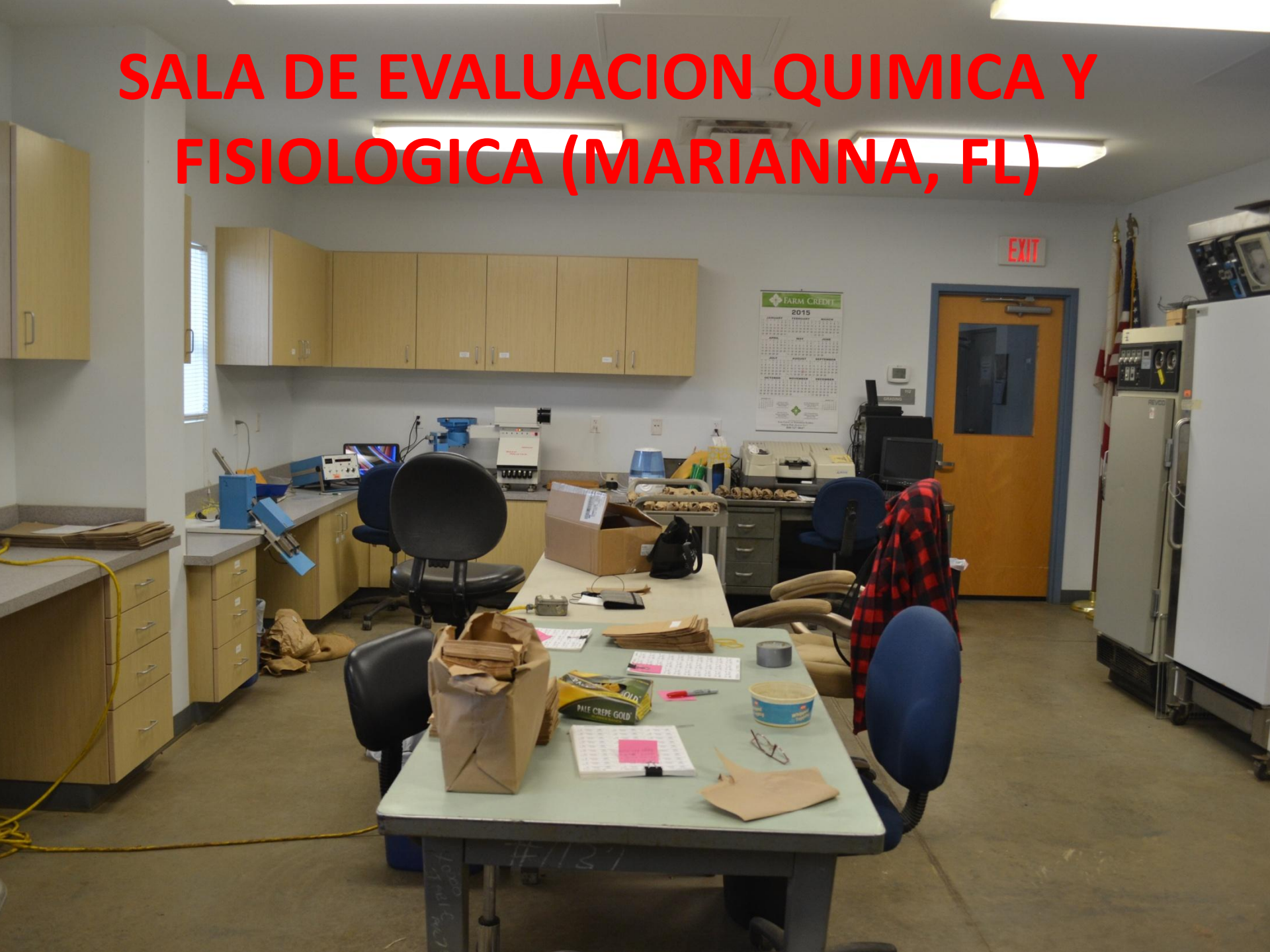


REQUERIMIENTOS DEL BREEDING COMERCIAL (Cont.)

5. INSTALACIONES

- a) PROCESAMIENTO DE MATERIAL (ZONAS SUCIAS)
- b) DEPOSITOS Y SALAS DE PREPARACION DE MATERIAL (ZONAS LIMPIAS)
- c) DE EVALUACION DE
 - CALIDAD (LABORATORIOS)
 - FITOSANITARIAS (INVERNACULOS)
 - FISIOLOGICAS (INVERNACULOS, SHELTERS)

SALA DE EVALUACION QUIMICA Y FISIOLÓGICA (MARIANNA, FL)



GALPON DE PROCESAMIENTO Y ALMACENAJE (MARIANNA, FL)



CAMARA DE FRIO CON CONTROL DE HUMEDAD (MARIANNA, FL)



INVERNACULOS (STEPHENVILLE, TX)



INFECTARIO SCLEROTIUM (TIFTON, GA)



MOVIENDO LOS EXCLUSORES DE LLUVIA (TIFTON, GA)



DE LA DECISION DE INSCRIBIR A LA VENTA DE SEMILLA

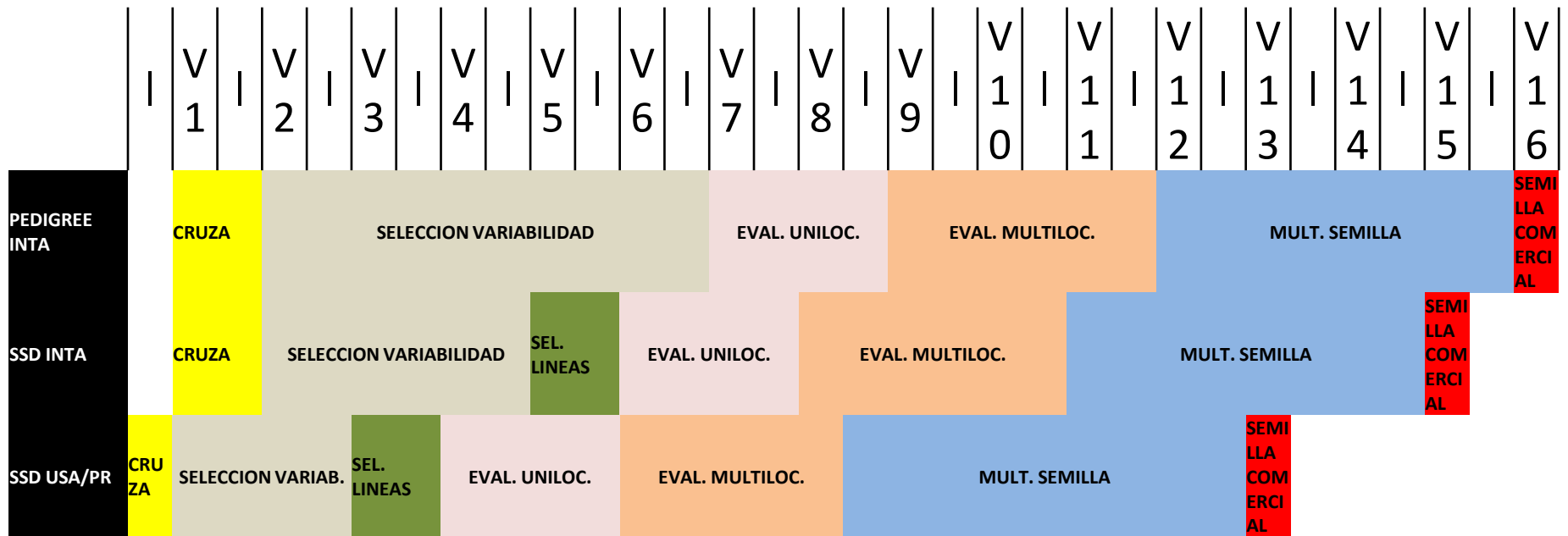
1. INSCRIPCION: SE DECIDE DESPUES DE CIERTO TIEMPO DE ENSAYO
 - a) A MAYOR TIEMPO, MAS SEGURO ESTOY DE QUE LO QUE VOY A INSCRIBIR ES SUPERADOR DE LO EXISTENTE
2. MULTIPLICACION DE SEMILLA:
 - a) INICIARLA ANTES DE INSCRIBIR. CUANTO ANTES? ESTOY LIMITADO POR LOS RECURSOS CON LOS QUE CUENTO (PERSONAL, MAQUINARIA, ALMACENAMIENTO, ETC.)
 - b) NO DEBIERA TENER DEMASIADAS LINEAS BAJO MULTIPLICACION, PUES SE COMPLICA MUCHO Y AUMENTA EL RIESGO DE ERRORES

DE LA DECISION DE INSCRIBIR A LA VENTA DE SEMILLA (Cont.)

1. TASA DE MULTIPLICACION EN MANI:

- a) NORMALMENTE ES DE 1^a10, ESTO ES QUE UN KILO DE UNA CATEGORIA PRODUCE 10 KILOS DE LA SIGUIENTE CATEGORIA. VARIA Y DEPENDE DE MUCHOS FACTORES.
- b) ESTO SIGNIFICA QUE PARTIENDO DESDE 10 KG EN EL ANIO 3 DE ENSAYO MULTILOCALIDAD HASTA LLEGAR A TENER SEMILLA PARA SEMBRAR 1000 HA (APERTURA COMERCIAL) NECESITARE 6 AÑOS

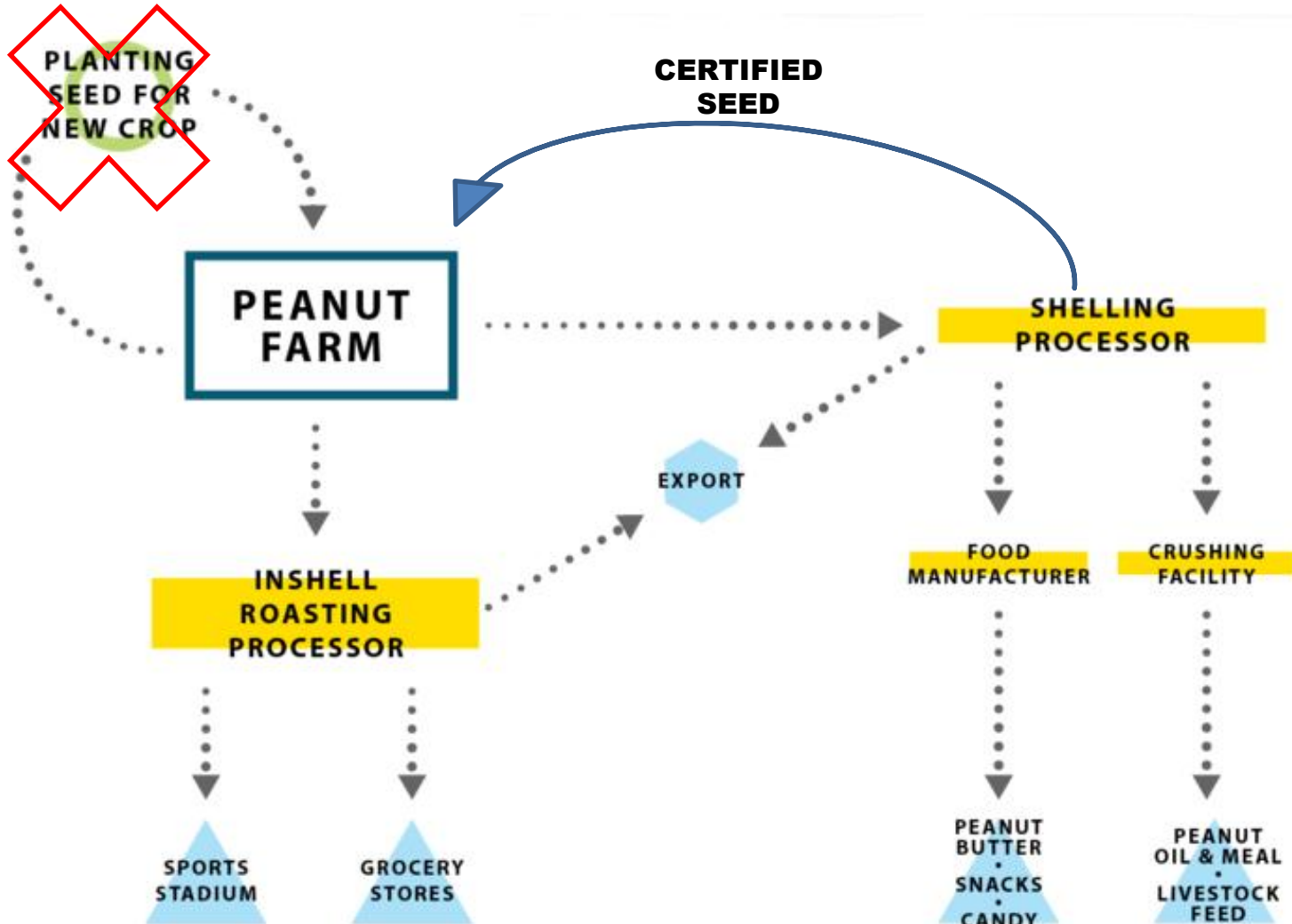
PLAZOS COMPARADOS ENTRE ALTERNATIVAS DE MEJORA



DISPONIBILIDAD DE CULTIVARES DE MANI

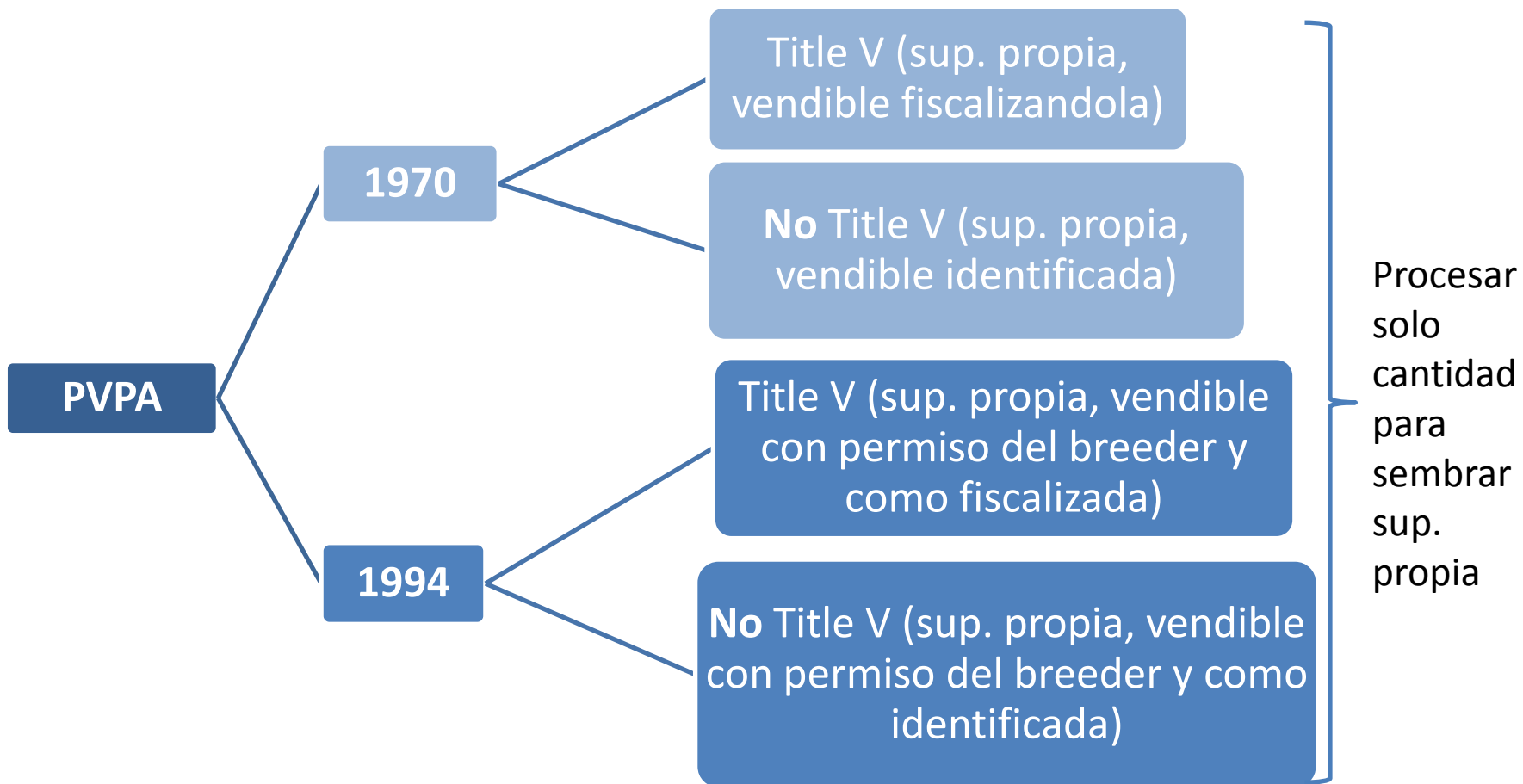
- DETERMINADA POR LAS CARACTERISTICAS DE LAS ZONAS PRODUCTIVAS, DE LOS ACTORES QUE PRODUCEN Y DE LAS EMPRESAS/INSTITUCIONES QUE CREAN CULTIVARES

MERCADO AMERICANO DEL MANI

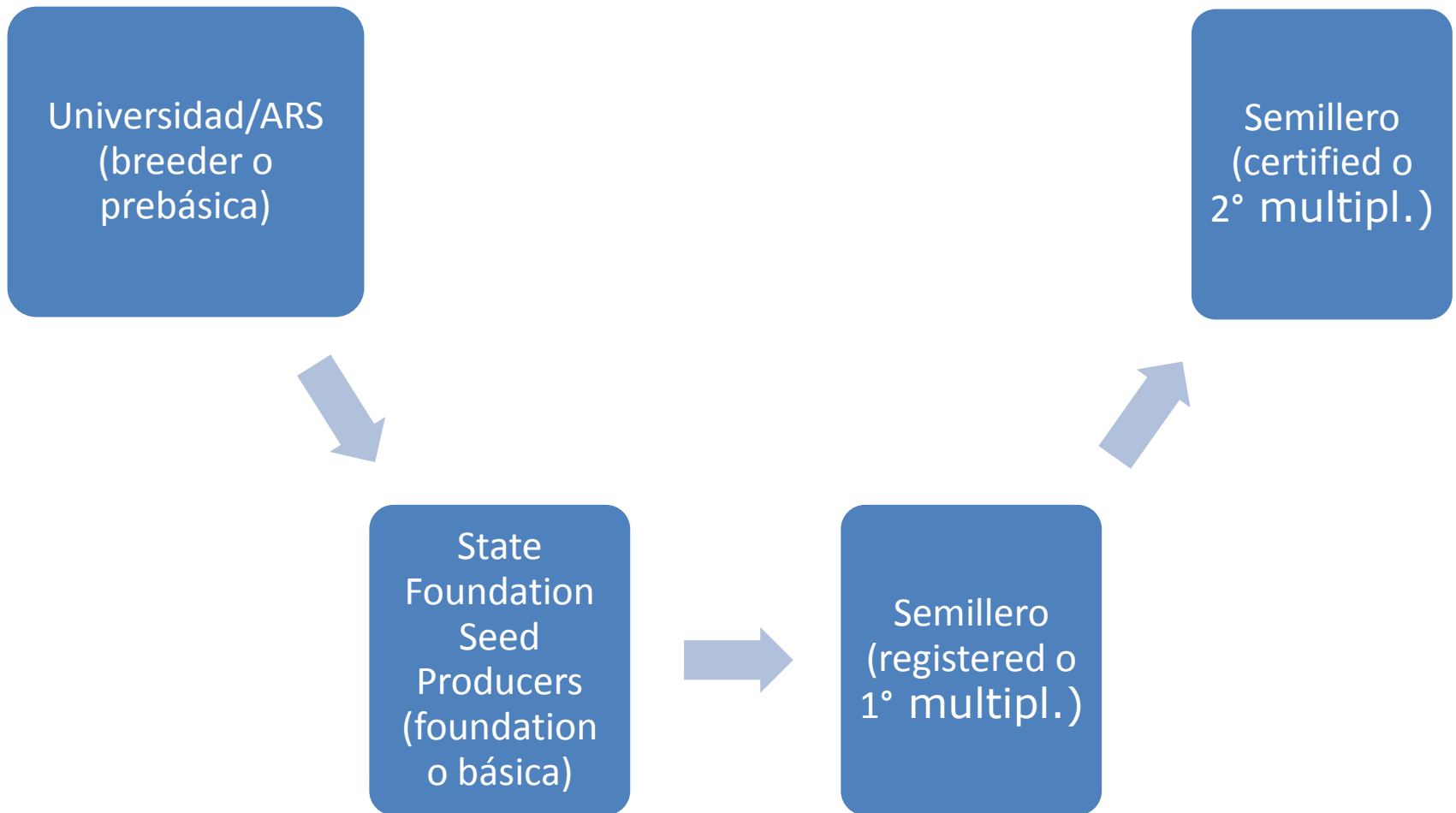


FUENTE: NATIONAL PEANUT BOARD

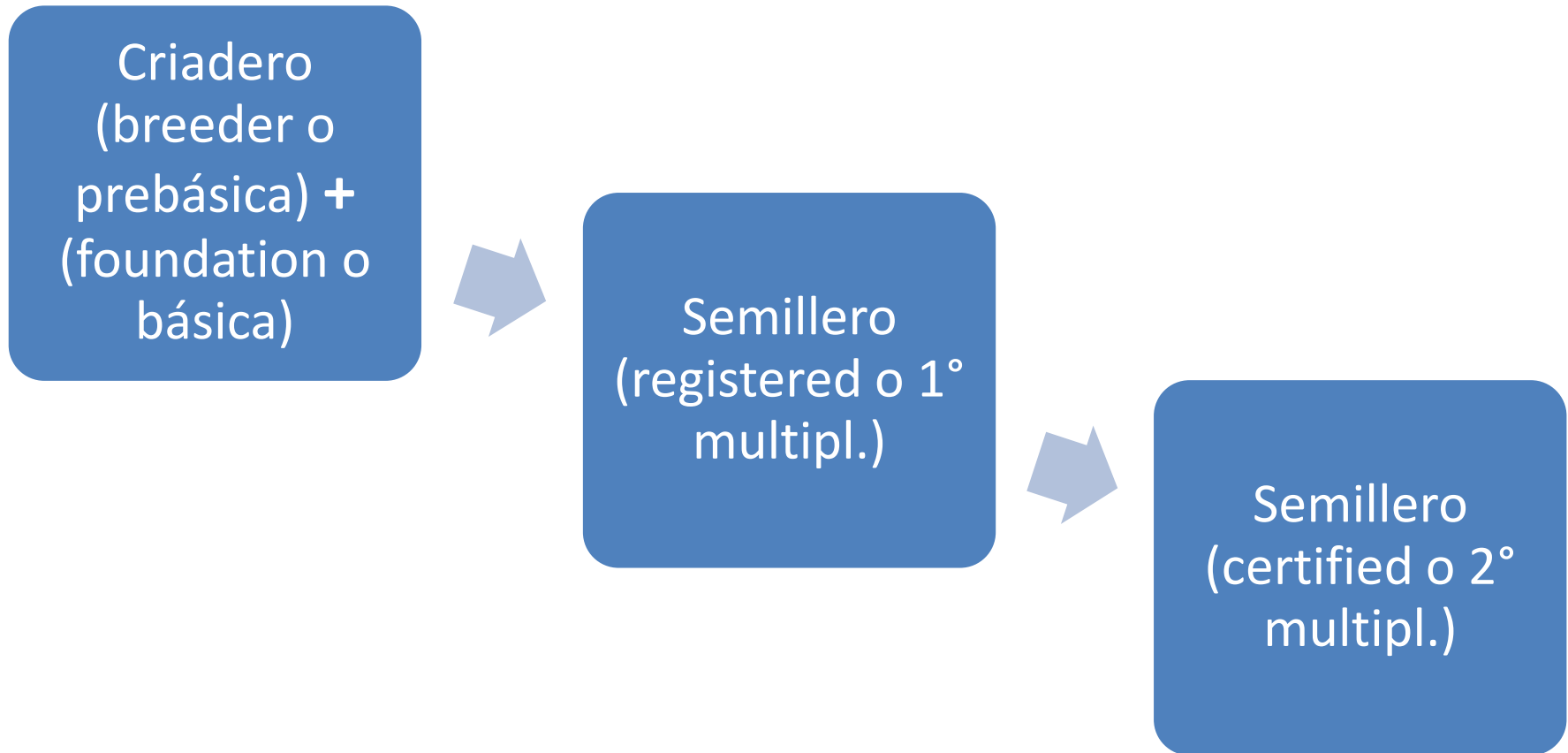
PROPIEDAD INTELECTUAL EN CVS. DE AUTÓGAMAS EN USA (*PLANT VARIETY PROTECTION ACT Y UTILITY PATENT*)



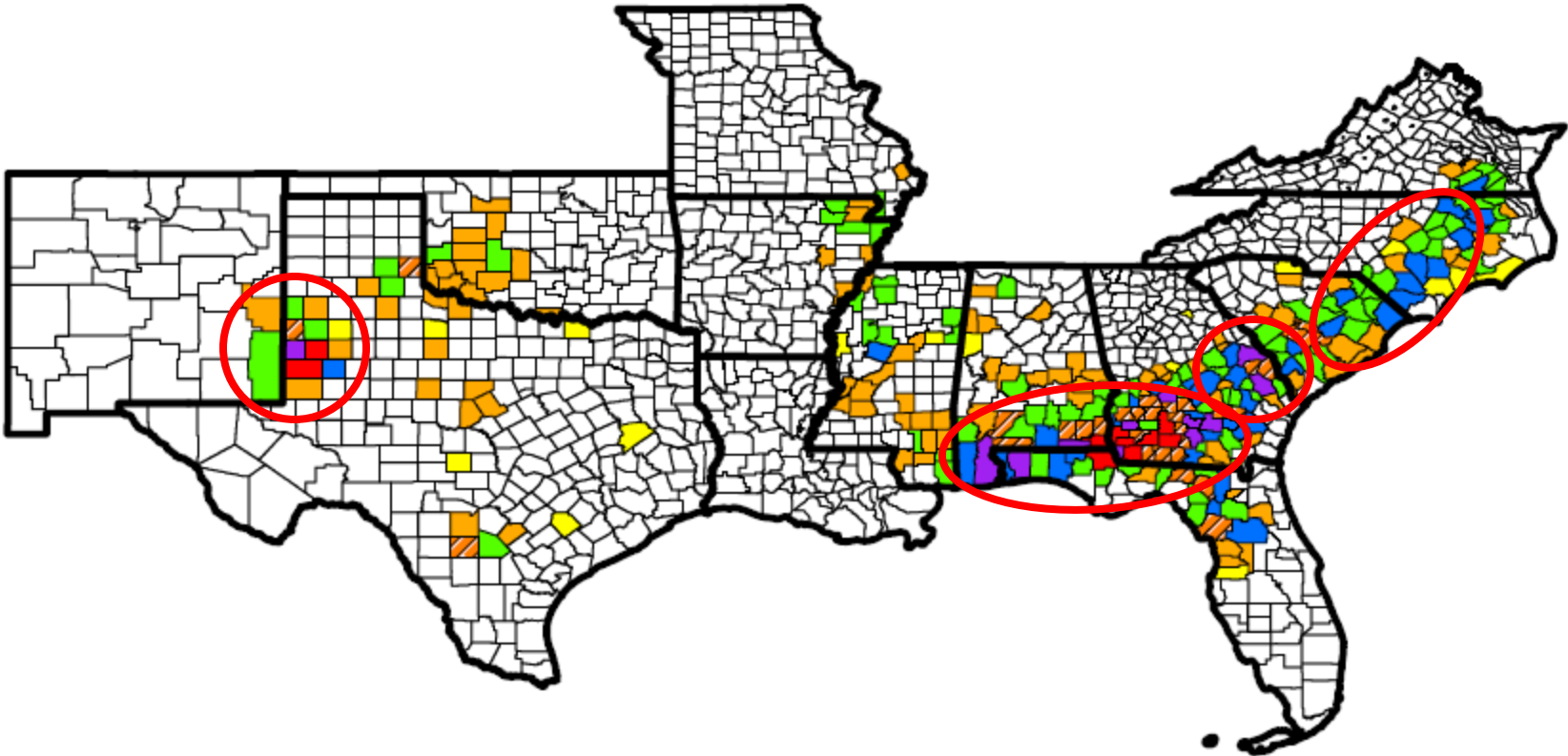
CULTIVARES CREADOS POR UNIVERSIDADES Y ARS, USA: QUIEN PRODUCE LAS DIFERENTES CATEGORIAS?



CULTIVARES CREADOS POR COMPAÑÍAS PRIVADAS EN USA: QUIEN PRODUCE LAS DIFERENTES CATEGORIAS



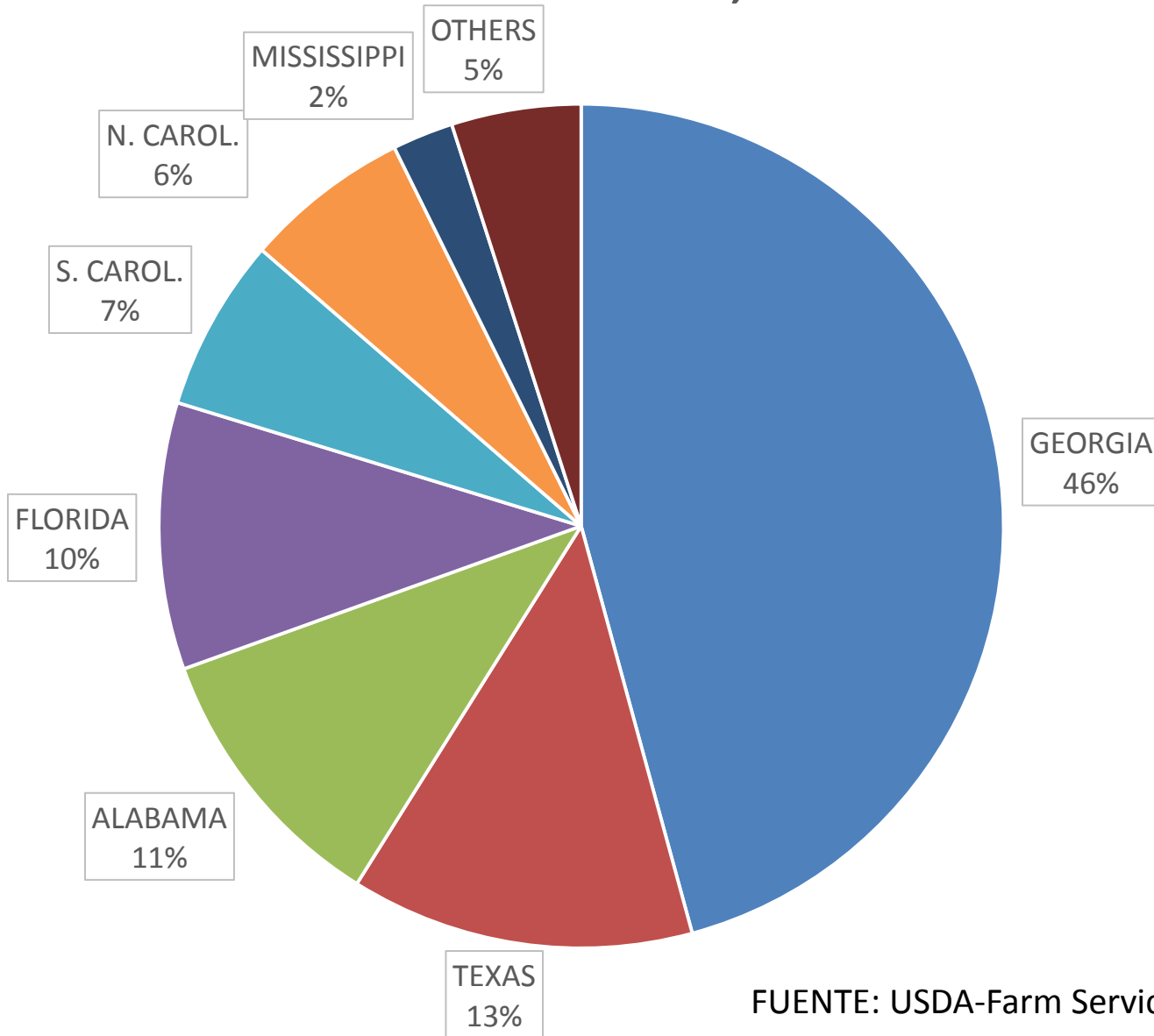
2015 U.S. PEANUT CERTIFIED ACRES



No Acres	5,001 to 10,000
1 to 50	10,000 to 20,000
51 to 1,000	20,001 to 30,000
1,001 to 5,000	Over 30,000

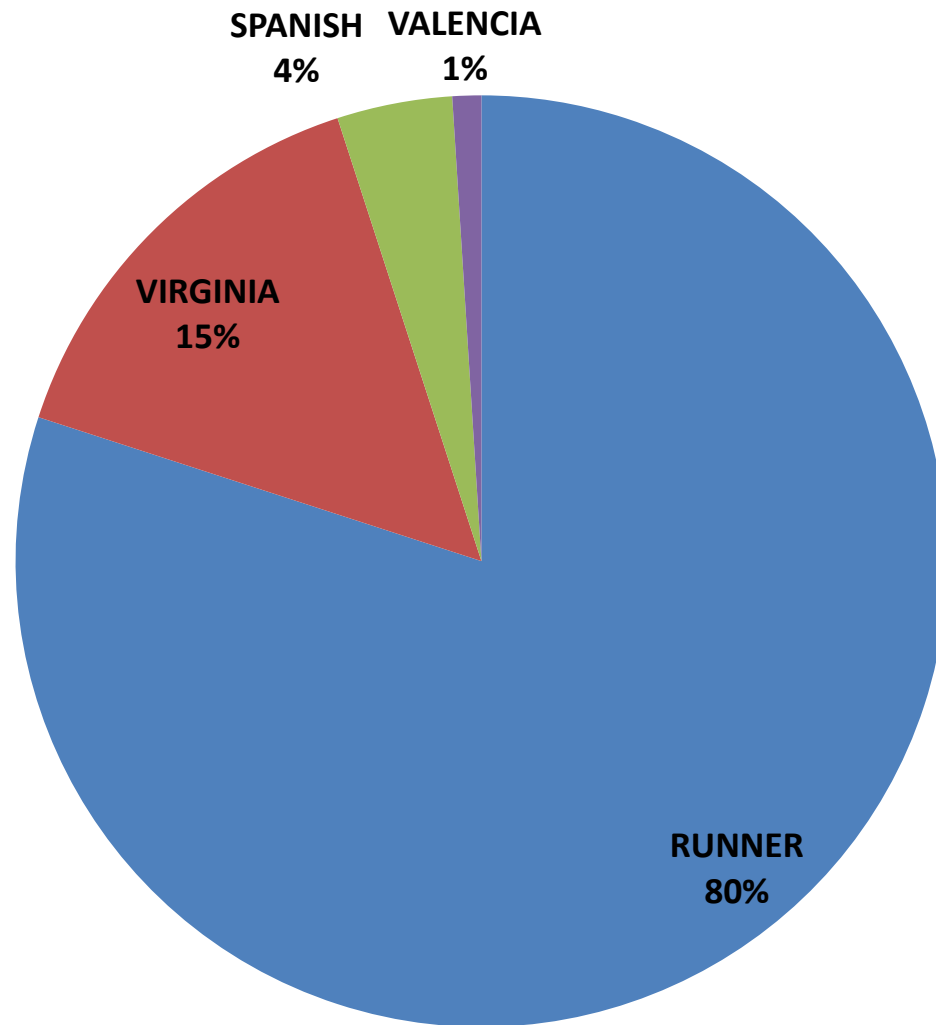
Map Generated by the
National Center for Peanut Competitiveness
University of Georgia
Source: Jan. 2016 FSA, USDA

MANÍ SEMBRADO EN 2017, POR ESTADO



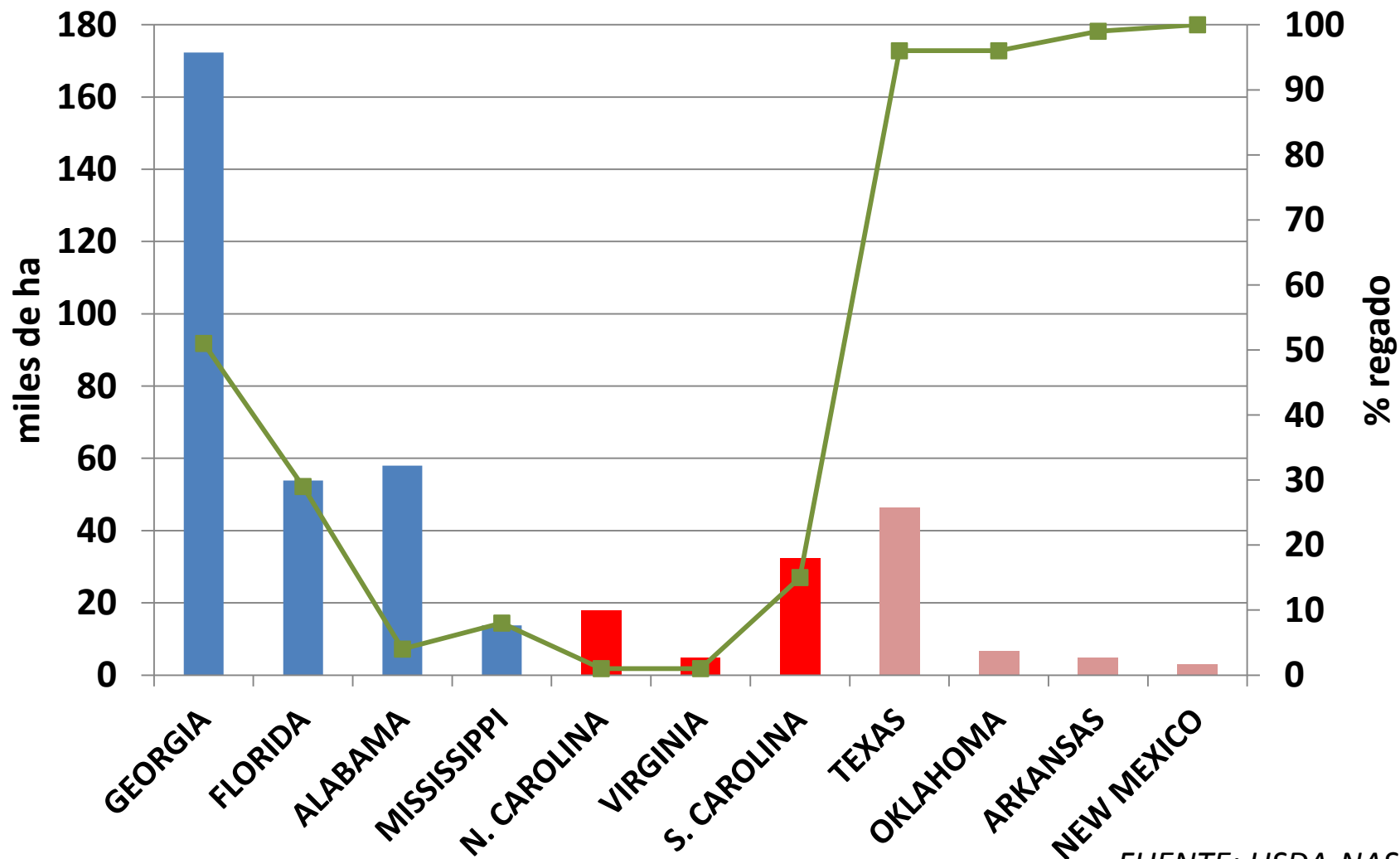
FUENTE: USDA-Farm Service Agency

TIPOS DE MANÍ EN EEUU 2014



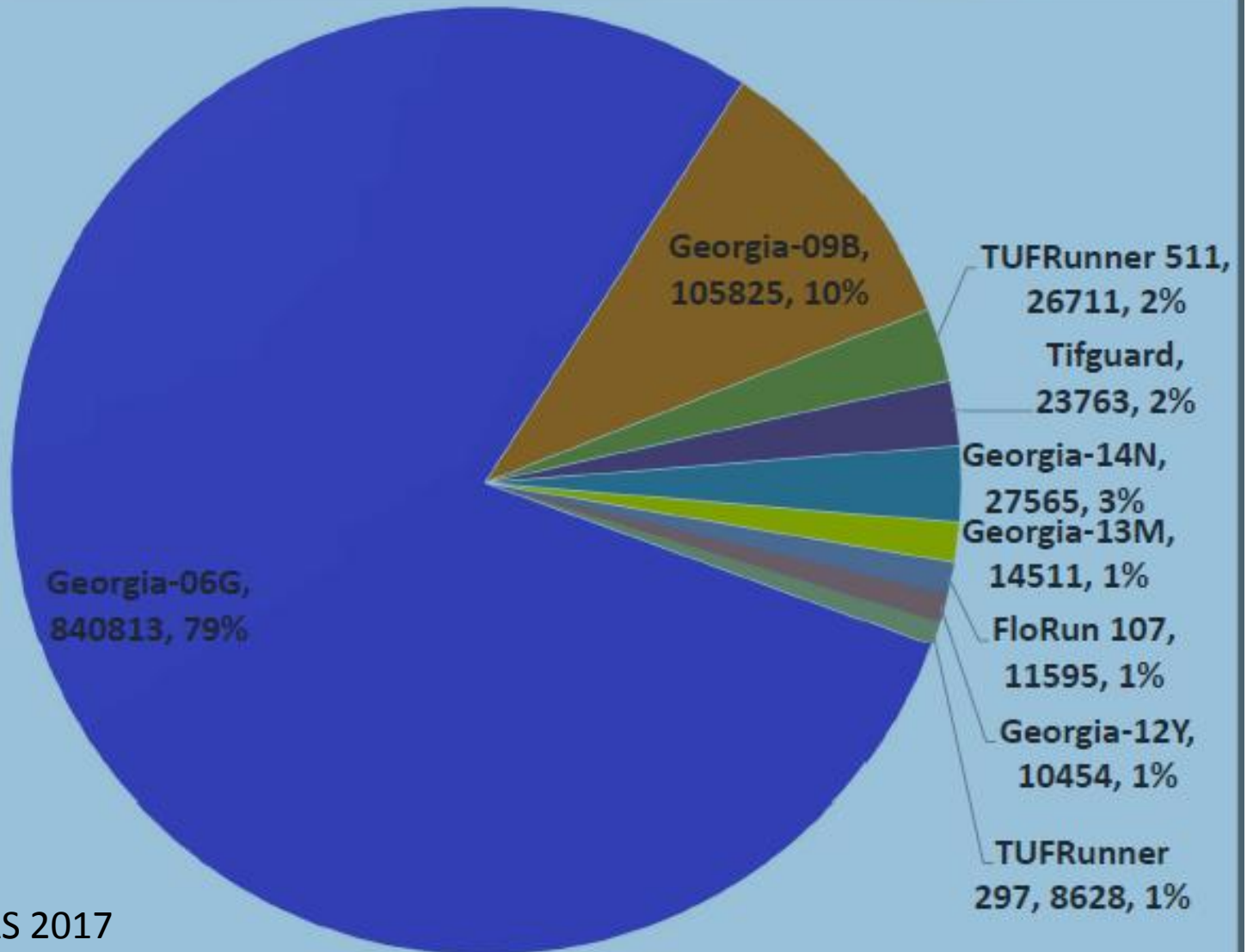
FUENTE: National Peanut Board

SUPERFICIE CULTIVADA Y PORCENTAJE REGADO EN USA (POR ESTADO) EN 2013



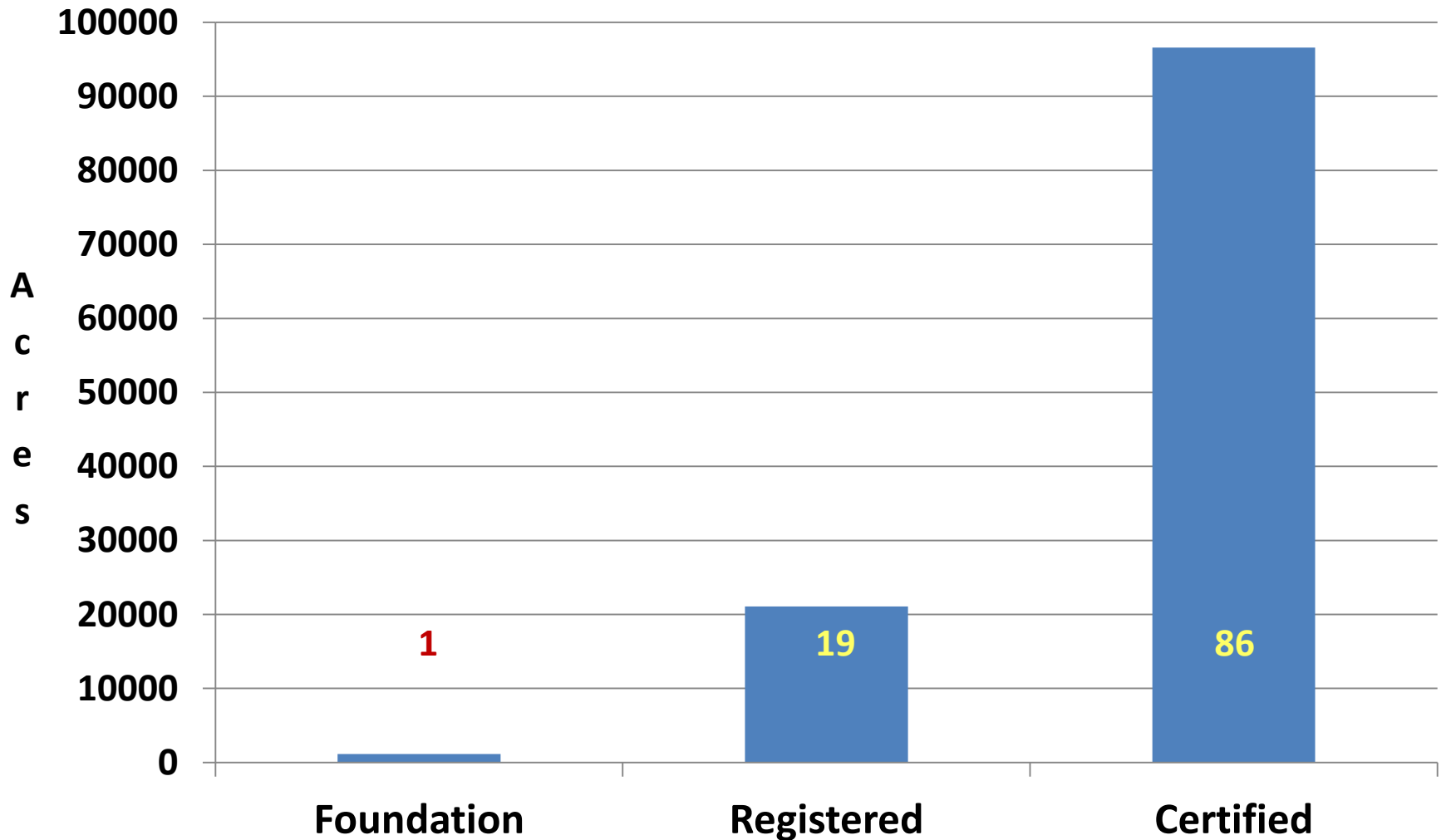
FUENTE: USDA-NASS

Estimated variety acreage, SE, 2017



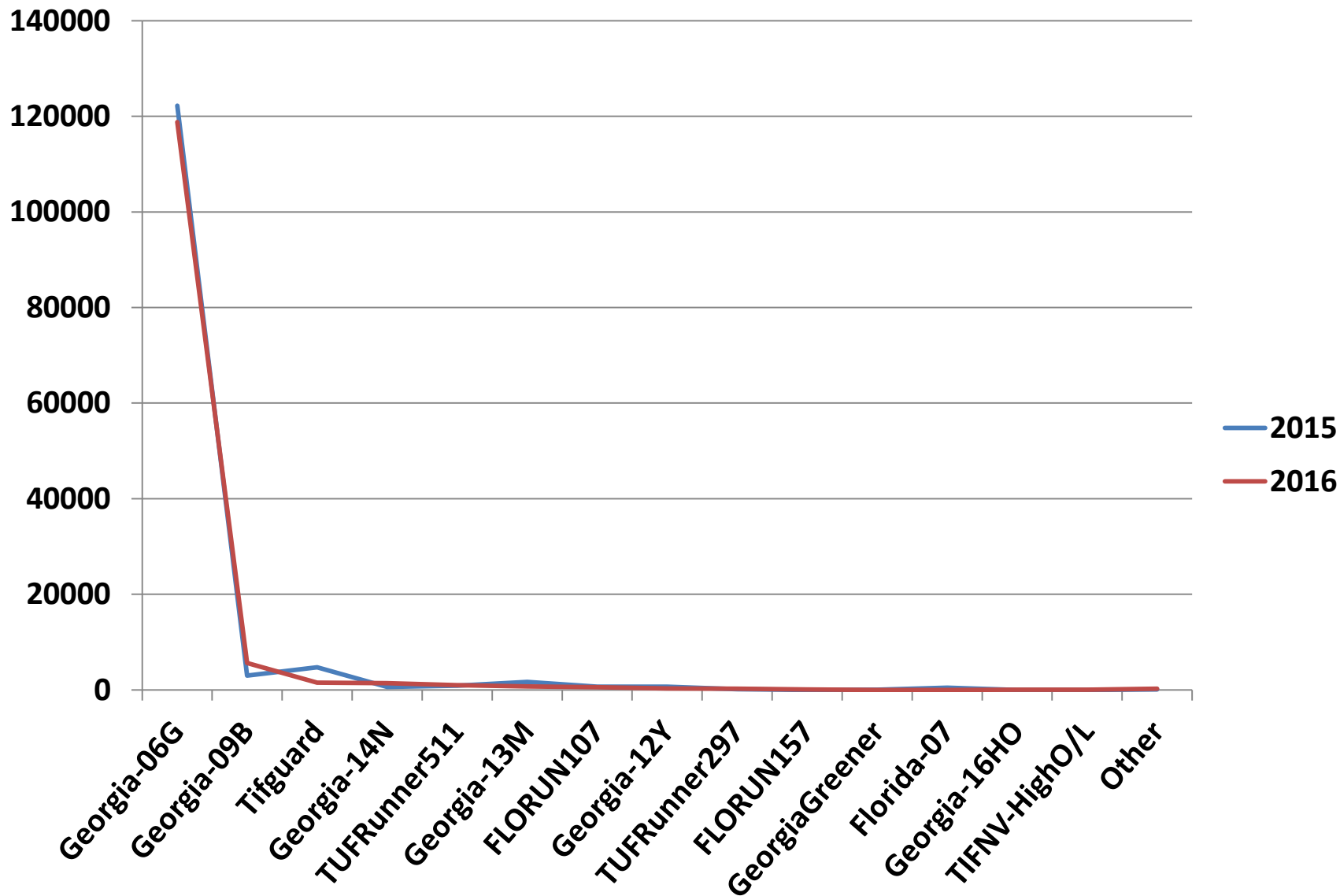
FUENTE: UF IFAS 2017

2016: ACRES DE GA-06G CERTIFICADOS EN GEORGIA P/PRODUCIR SEMILLA DE DIVERSAS CATEGORÍAS

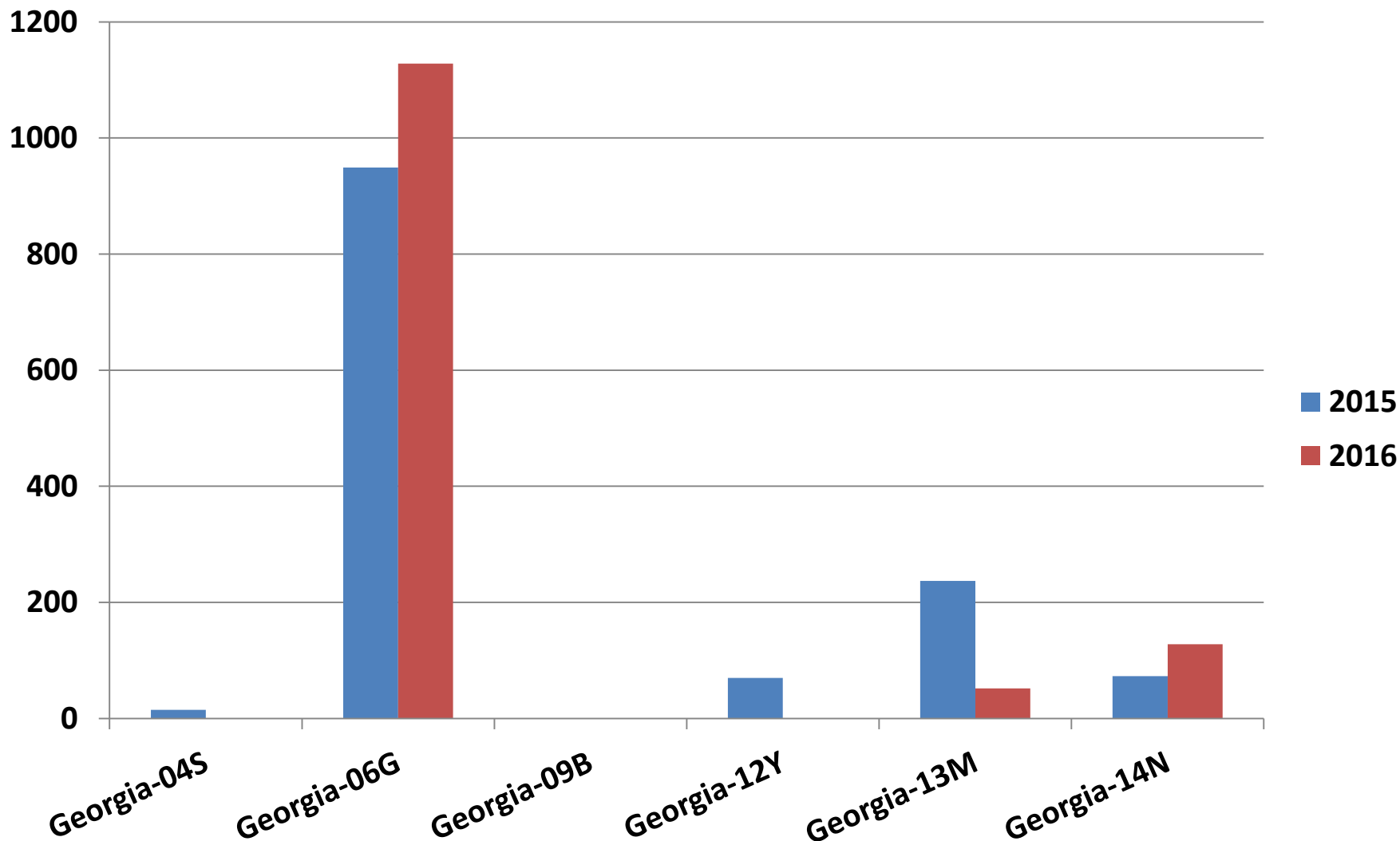


FUENTE: GA Crop Improvement Ass.

ACRES CERTIFICADOS (F+R+C) EN 2015 Y 2016 EN GEORGIA



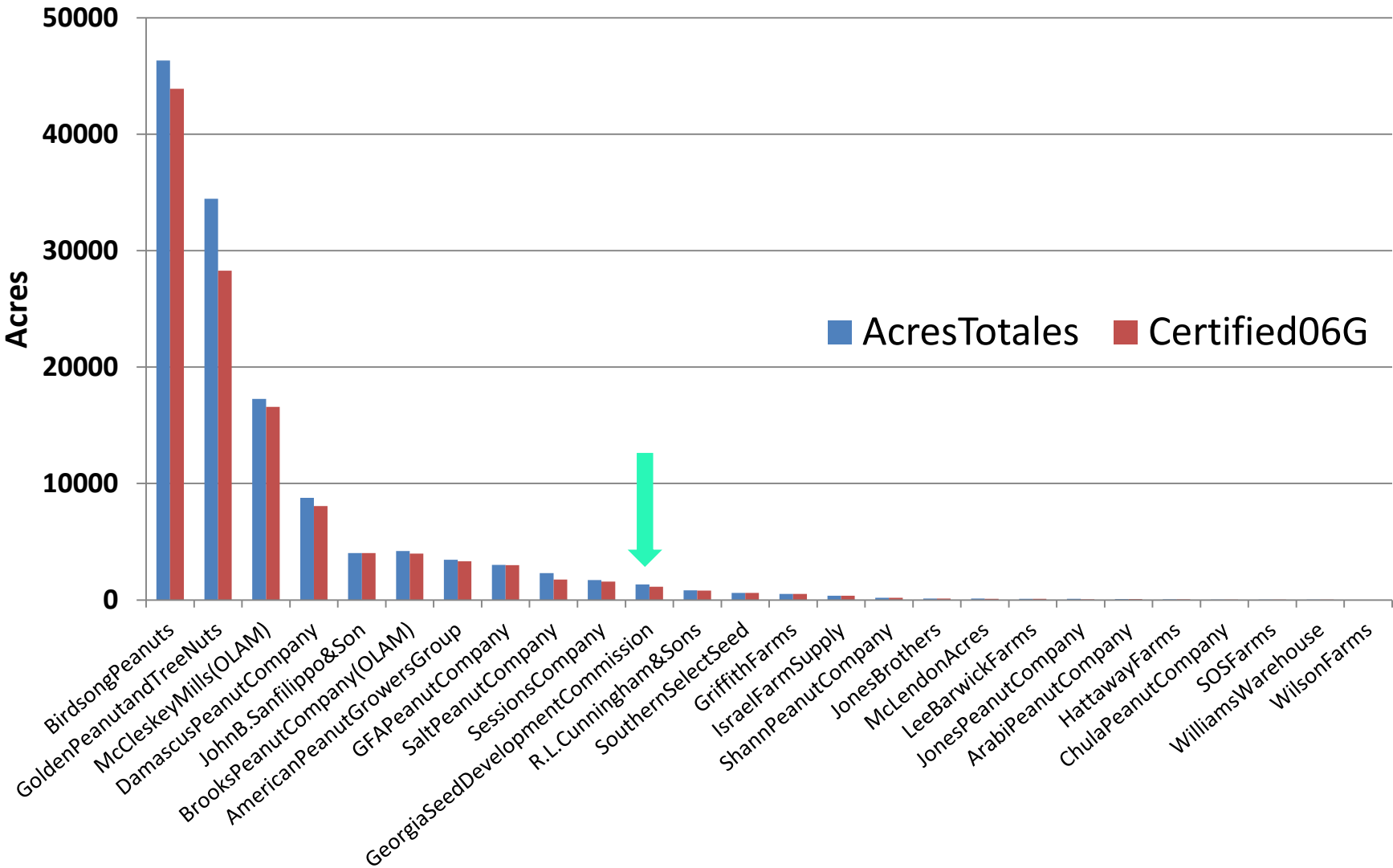
EVOLUCIÓN DE ACRES SEMBRADOS POR GSDCOMM. PARA PRODUCIR SEMILLA FOUNDATION DE CULTIVARES DE LA UGA



2017 Peanut Rx

Variety ¹	Spotted Wilt Points	Leaf Spot Points	Soilborne Disease Points
			White mold
Bailey ³	10	15	10 ←
Florida-07 ²	10	20	15
Florida Fancy ²	25	20	20
FloRun™ '107' ²	20	25	20
FloRun™ '157' ^{1,2}	25	25	20
Georgia-06G	10	20	20
Georgia-07W	10	20	15
Georgia-09B ²	20	25	25
Georgia-12Y ⁵	5	15	10 ←
Georgia-13M ^{1,2}	10	30	25
Georgia-14N ^{1,2,4}	10	15	15
Georgia Green	30	20	25
Sullivan ^{1,2}	10	20	15
Tifguard ⁴	10	15	15
TUFRunner™ '297' ^{1,2}	10	25	20
TUFRunner™ '511' ²	20	30	15

SUPERFICIE SEMBRADA P/CERTIFICAR SEMILLA EN GA 2016: ACRES TOTALES Y DE 06G POR COMPAÑIA

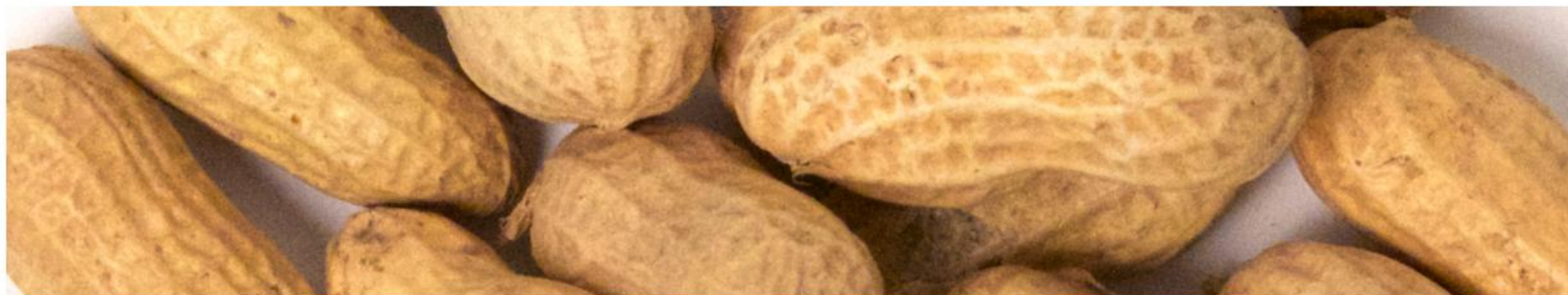


FUENTE: GA Crop Improvement Ass.

REGALIAS 2016

UNIVERSITY OF GEORGIA

- **U\$S 7.6 MILLONES**
 - **62% PROVIENEN DE CULTIVARES**
 - **40% PROVIENEN DE CULTIVARES DE MANI**
(U\$S 3 MILLONES, 25% PARA EL CREADOR)
 - **16% FARMACEUTICOS Y**
BIOTECNOLOGICOS



OUR PRODUCTS

[PEANUTS](#)[PEANUT OIL](#)[PEANUT FLOUR](#)[HULL AND FIBER](#)[PEANUT MEAL](#)[SEED](#)[SOUTHEAST](#)[SOUTHWEST](#)

SOUTHEAST VARIETIES

Georgia 06G

A large seeded medium maturity variety (140 days \pm) released in 2006 by the University of Georgia Agricultural Experiment Station in Tifton, Georgia. The Georgia 06G is a high yielding Tomato Spot Wilt Virus resistant variety that has excellent grade characteristics.

Georgia 09B

A high oleic, Tomato Spotted Wilt Virus resistant, medium maturity variety (140 days \pm) released in 2009 by the University of Georgia Agricultural Experiment Station in Tifton, Georgia. This variety was developed from the first backcross between Georgia Green and a high oleic parent. The high oleic oil chemistry gives this variety a longer shelf life in processed peanut products. The seed size for this variety is "medium," meaning it is smaller than the Georgia 06G and Georgia Greener.

Tifguard

Developed by USDA's Agriculture Research Service in Tifton, Georgia., Tifguard has resistance to nematodes so as to be characterized as "near immunity," and it offers good yields and grades, especially in places where there would be no yield from other varieties. It offers good resistance to Tomato Spotted Wilt Virus and is medium maturity (140 days \pm).

FloRun 107

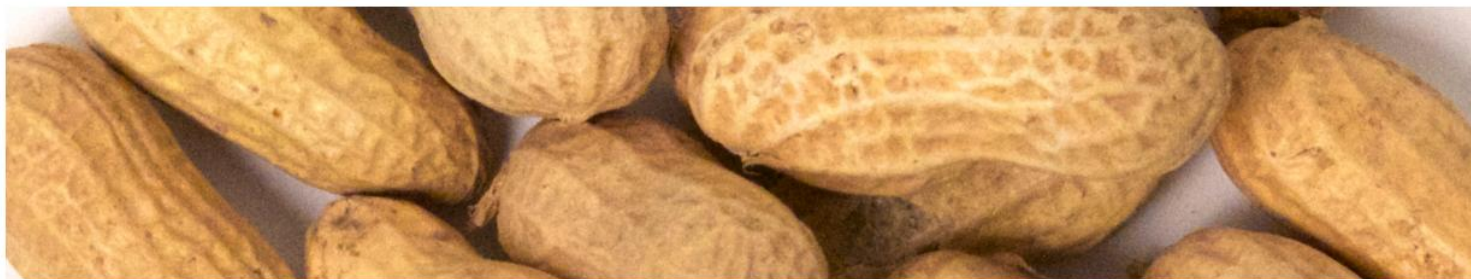
Released by the University of Florida, this is a medium to late maturing (145 days \pm) high oleic variety. The seed size is "medium" and is similar to that of Georgia 09B. It has very good resistance to Tomato Spotted Wilt Virus and White Mold, but is susceptible to Leaf-spot and is a high yielding variety.

TUF Runner 511

Released by the University of Florida, this is a medium to late maturing (145 days \pm) high oleic variety. This variety has superior yield, excellent grades and is large seeded. It has moderate Tomato Spotted Wilt Virus resistance, very good White Mold resistance, but is susceptible to Leaf Spot.

Interested in purchasing
our products?

[CONTACT US](#)

[OUR PRODUCTS](#)[PEANUTS](#)[PEANUT OIL](#)[PEANUT FLOUR](#)[HULL AND FIBER](#)[PEANUT MEAL](#)[SEED](#)[SOUTHEAST](#)[SOUTHWEST](#)[VIRGINIA](#)

Interested in purchasing
our products?

[CONTACT US](#)

VIRGINIA VARIETIES

Bailey

This variety released by North Carolina State University, is relatively new to the Virginia/Carolina area and has shown strong yield potential. It is a large seeded variety with bright hulls and pod size similar to the older NCV 11 variety. It has superior disease tolerance to CBR, Sclerotinia blight, tomato spotted wilt and stem rot (white mold). It also shows reduced susceptibility to late leaf spot and growers are often able to reduce spray applications with close management. Bailey has a maturity similar to NCV 11 but can be earlier given the growing conditions (150 days in North Carolina and Virginia, 135 days in South Carolina). This variety expresses itself with a large, rank canopy and growers find the use of a growth regulator or gps guidance helpful when digging. Bailey expresses normal oleic oil characteristics.

Sugg

The Sugg variety was released by North Carolina State University with the Bailey. It is a bright inshell variety that has larger pods than the Bailey and also has high yield potential. Its disease tolerance is similar to Bailey but stronger than previous larger seeded varieties like Gregory and Phillips. Maturity for the Sugg variety is similar to NCV11 at 150 days in North Carolina and Virginia, and 135 in South Carolina. Sugg also has a large canopy like Bailey and has normal oil characteristics.

CHAMPS

CHAMPS is a large seeded variety released through Virginia Tech in cooperation with North Carolina State University. It matures approximately five days earlier than NCV 11 with pods that are larger than NCV 11. It has high yield potential and moderate tolerance to tomato spotted wilt virus. It is susceptible to white mold and CBR. It has normal oil characteristics.

Sullivan

This variety will be a new release from North Carolina State University for 2015 with very limited seed going for seed production. This variety is similar to the Bailey in size and disease tolerance. It has high yield potential similar to Bailey. Disease tolerance to CBR, Sclerotinia, white mold and TSWV is very good. Maturity is similar to the NCV11. This variety has high O/L oil characteristics.

Wynne

Wynne is also a new release from North Carolina State University for 2015 and will be available only for seed production in 2015. It is a larger seeded variety with jumbo pods exceeding that of CHAMPS, Sugg and Florida Fancy in early trials. Its disease tolerance for CBR, TSWV, and leaf spot diseases is similar to Bailey. Sclerotinia tolerance is not as good as Bailey in early trials. Yield potential is strong, similar to Sugg. This variety has high O/L oil characteristics.



OUR PRODUCTS

PEANUTS

PEANUT OIL

PEANUT FLOUR

HULL AND FIBER

PEANUT MEAL

SEED

SOUTHEAST

SOUTHWEST

Interested in purchasing our products?

CONTACT US

SOUTHWEST VARIETIES

RUNNERS

Georgia 09B

A high oleic, Tomato Spotted Wilt Virus resistant, medium maturity Runner variety (140 days \pm) released in 2009 by the University of Georgia Agricultural Experiment Station in Tifton, Georgia. This variety was developed from the first backcross between Georgia Green and a high oleic parent. The high oleic oil chemistry gives this variety a longer shelf life in processed peanut products. The seed size for this variety is "medium", meaning it is typically similar to other Runner varieties in the southwest.

TamRun OL11

Released by Texas AgriLife Research in 2011, this is a medium maturing (140 days \pm) high oleic Runner variety. In variety trials the TamRun OL11 showed higher grades than any Runner variety previously released by Texas AgriLife. It is well suited for West Texas peanut production and has a higher tolerance to Sclerotinia Blight than most varieties. Seed size is "medium."

Webb

Released by Texas AgriLife Research in 2012, it is the first high-oleic, nematode resistant Runner peanut variety released by the program. It is a medium maturing (140 days \pm) high oleic Runner variety. It has moderate resistance to Sclerotinia Blight and should be suited for production in all areas of the Southwest. Seed size is "medium."

Lariat

A high oleic Runner variety developed by the USDA in conjunction with the Oklahoma Agricultural Experiment Station and the Oklahoma Peanut Commission. This variety exhibits medium maturity (140 days \pm) released in 2016. Lariat is the result of varietal crossing in 2009 with Red River Runner to increase disease resistance, yield, and improve seed germination. In unmanaged trials, Lariat demonstrated resistance to Sclerotinia Blight and to Pod Rot, reducing the need for fungicide applications. The seed size is "medium to large" when compared with other runner varieties in the southwest region of the US.

SPANISH

AT-9899™

Released by Golden in 2004, this is a medium maturing (140 days \pm) high oleic Spanish market type variety. Growth habit resembles Runner varieties with spreading vegetative development and pegging from the limbs. It is not resistant to TSWV. With a tendency to produce a prolific number of pods, yield potential is excellent in sandy soils. Seed size is "small."

TamNut OL06

Released by Texas AgriLife Research in 2006, this is an early to medium maturing (135 days \pm) high oleic Spanish type variety. It produces a large Spanish kernel, similar in size to a runner. Maturity is a few days longer than previously released Spanish varieties from Texas AgriLife. Yield potential is good in West Texas and Oklahoma. Seed size is "medium."

OLé

A high oleic Spanish variety released by USDA-ARS, the Oklahoma Agricultural Experiment Station, and Oklahoma Peanut Commission. This is a true Spanish type variety with improved yield and disease resistance to Pod Rot and Sclerotinia Blight. A short season variety, OLé is expected to mature in 120 days after planting (DAP) and exhibits "small" seed size. This variety became commercially available in 2016.

Schubert

A high oleic Spanish variety developed and released by Texas AgriLife Research in 2013 and commercially available in 2017, it is an early maturing (120 days \pm) true spanish type. With a seed size smaller than TamNut OL06 and similar to OLin and other true spanish types, yield trial results of higher yields and grades, Schubert looks to perform well in the Southwest. Seed size is "small."

VIRGINIA

Florida Fancy

Released by the Florida Agricultural Experiment Station, this is a medium maturing (140 days \pm) high oleic Virginia type variety. Growth habit tends to resemble Runner varieties and has excellent yield potential, especially in sandy soils. This variety exhibits good TSWV resistance for Virginia type peanut varieties. Pod size is not typically as large as Gregory. Seed size is "large" among all types.

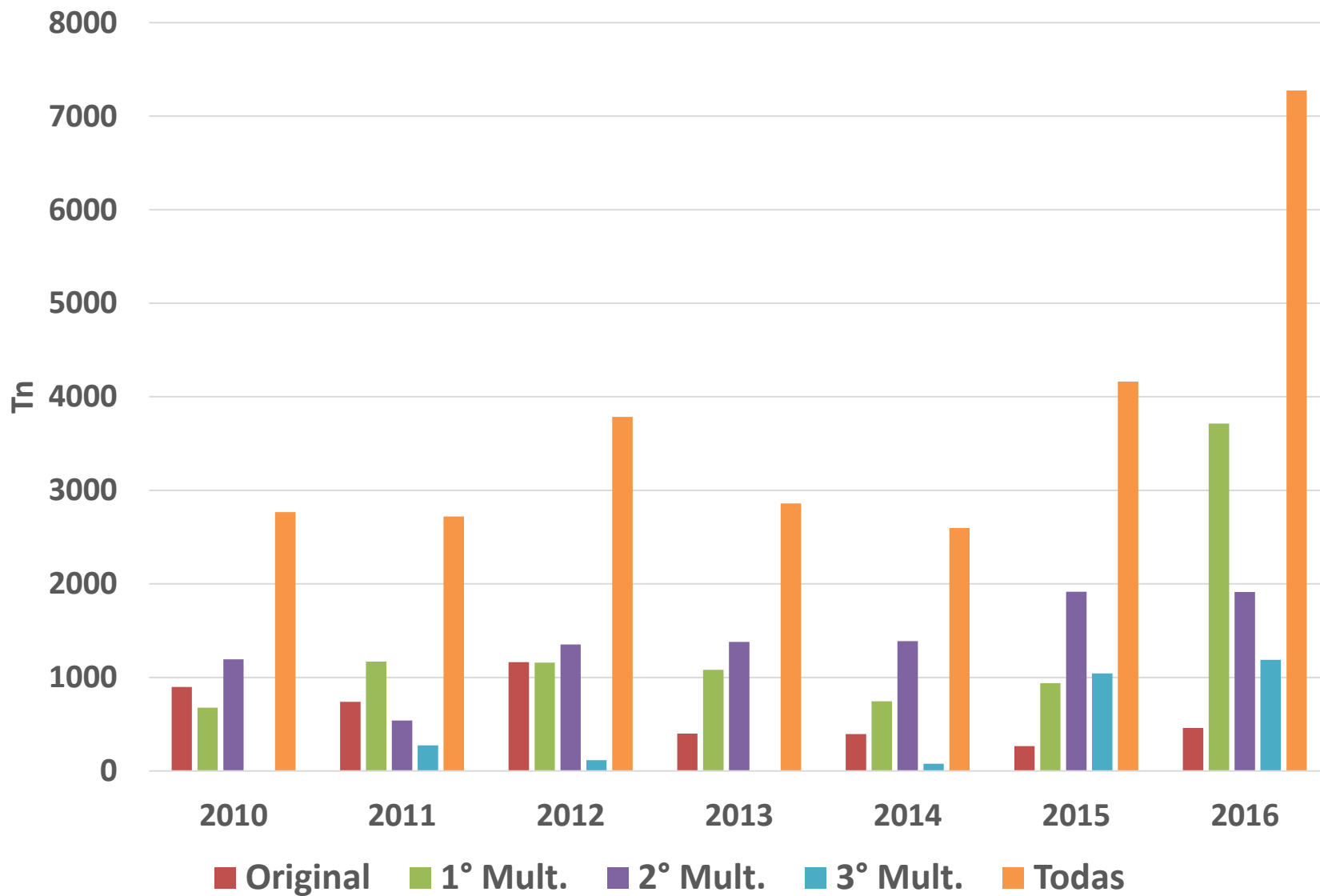
GOLDEN PEANUT AND TREE NUTS INSTALACIONES EN USA

<i>ESTADO</i>	<i>PLANTAS</i>
GEORGIA	3 (RUNNER): 1 PLANTA SELECCIÓN, 1 PLANTA SELECCIÓN + ACEITE, *1 PLANTA HARINA, ACEITE DE MANI TOSTADO Y EXTRACTOS
ALABAMA	1 PLANTA SELECCIÓN Y BLANCHEADO DE RUNNER. PROCESAMIENTO DE VAINAS (FIBRA)
TEXAS	2: *1 PLANTA DE SELECCIÓN DE RUNNER; *1 PLANTA DE SELECCIÓN DE RUNNER+SPANISH+VIRGINIAS
LAS 6 PLANTAS TIENEN ALMACENAJE EN FRÍO. *PROCESA TAMBIEN MANÍ ORGÁNICO	

MERCADO ARGENTINO DE SEMILLA DE MANI

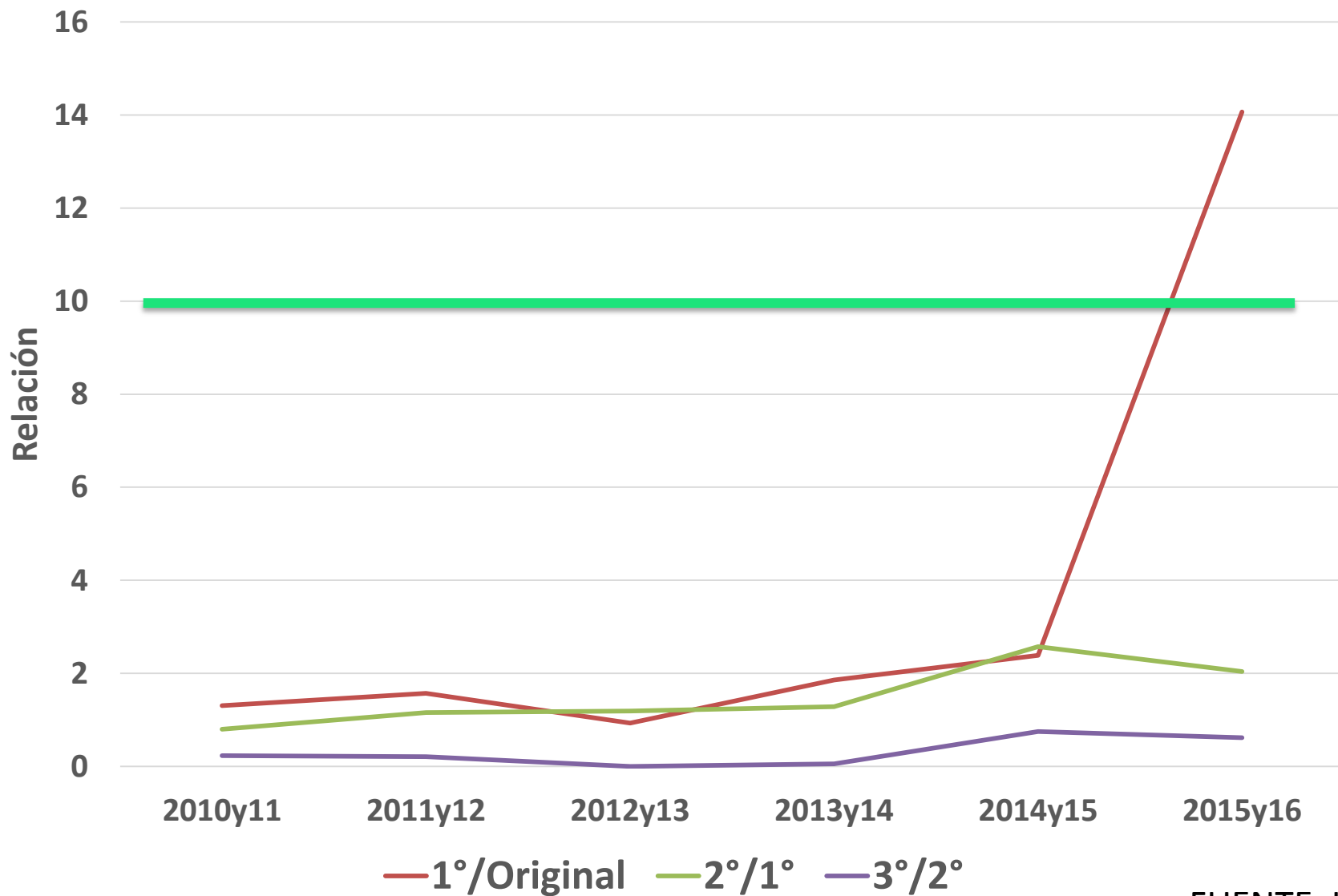
1. FUERTEMENTE INFLUIDO POR EL USO PROPIO (COMO EL RESTO DE LAS AUTOGAMAS EN ARGENTINA)
2. POCAS PLANTAS DISEÑADAS Y DEDICADAS A SEMILLA
3. MUY LEJOS DE LOS ESTANDARES SEMILLEROS DE USA

PRODUCCION DE SEMILLA FISCALIZADA DE MANI, POR CATEGORIA (SEGUN INASE)



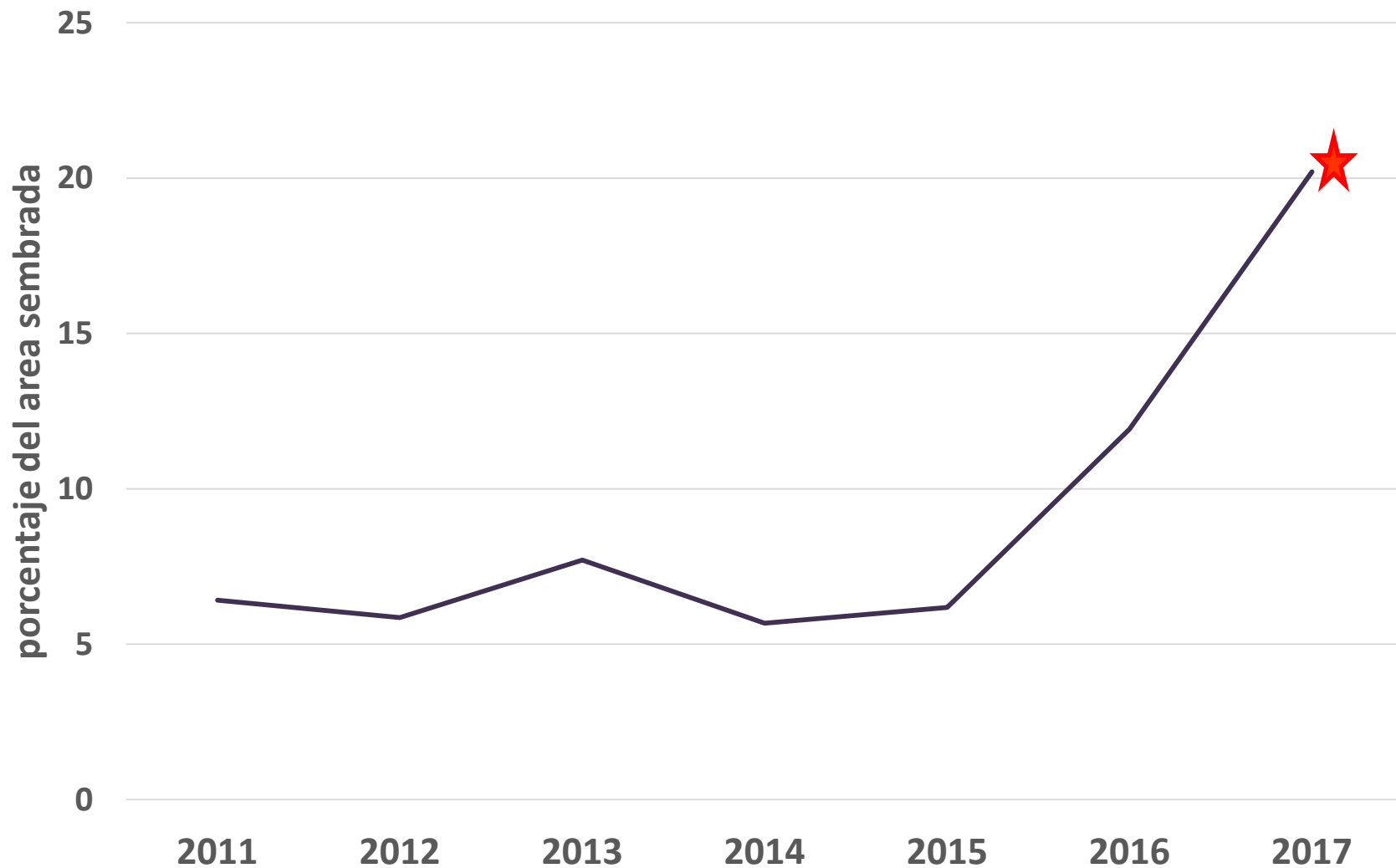
FUENTE: INASE

RELACIÓN ENTRE CATEGORÍAS DERIVADAS (6 ULTIMAS CAMPAÑAS)



FUENTE: INASE

% QUE PODRÍA HABERSE SEMBRADO CON SEMILLA FISCALIZADA 2011/12 AL 2017/18



FUENTE: INASE

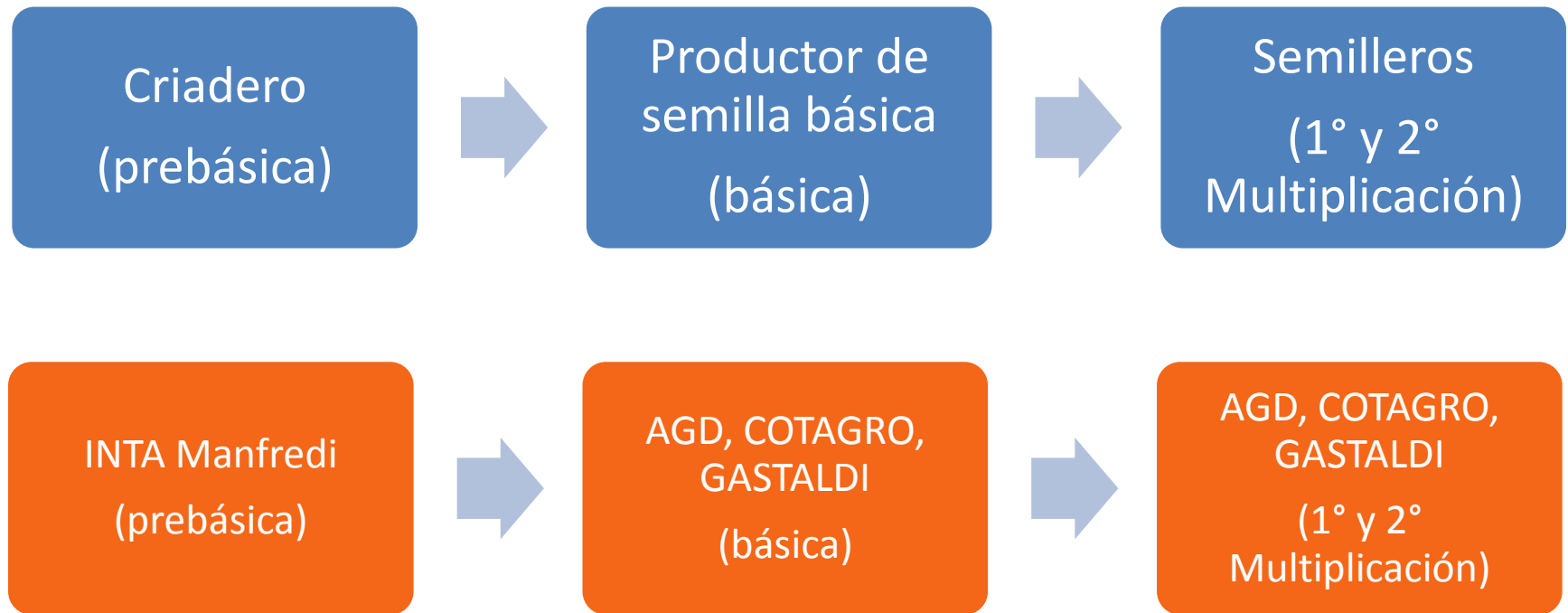
CULTIVARES CREADOS POR COMPAÑÍAS PRIVADAS EN ARGENTINA: QUIEN PRODUCE LAS DIFERENTES CATEGORIAS

Criadero o Introdutor
y Productor de semilla
básica
(básica)



Semillero
(1° y 2° Multiplicación)

CULTIVARES DEL CONVENIO **INTA-ASEM**: QUIEN PRODUCE LAS DIFERENTES CATEGORIAS?



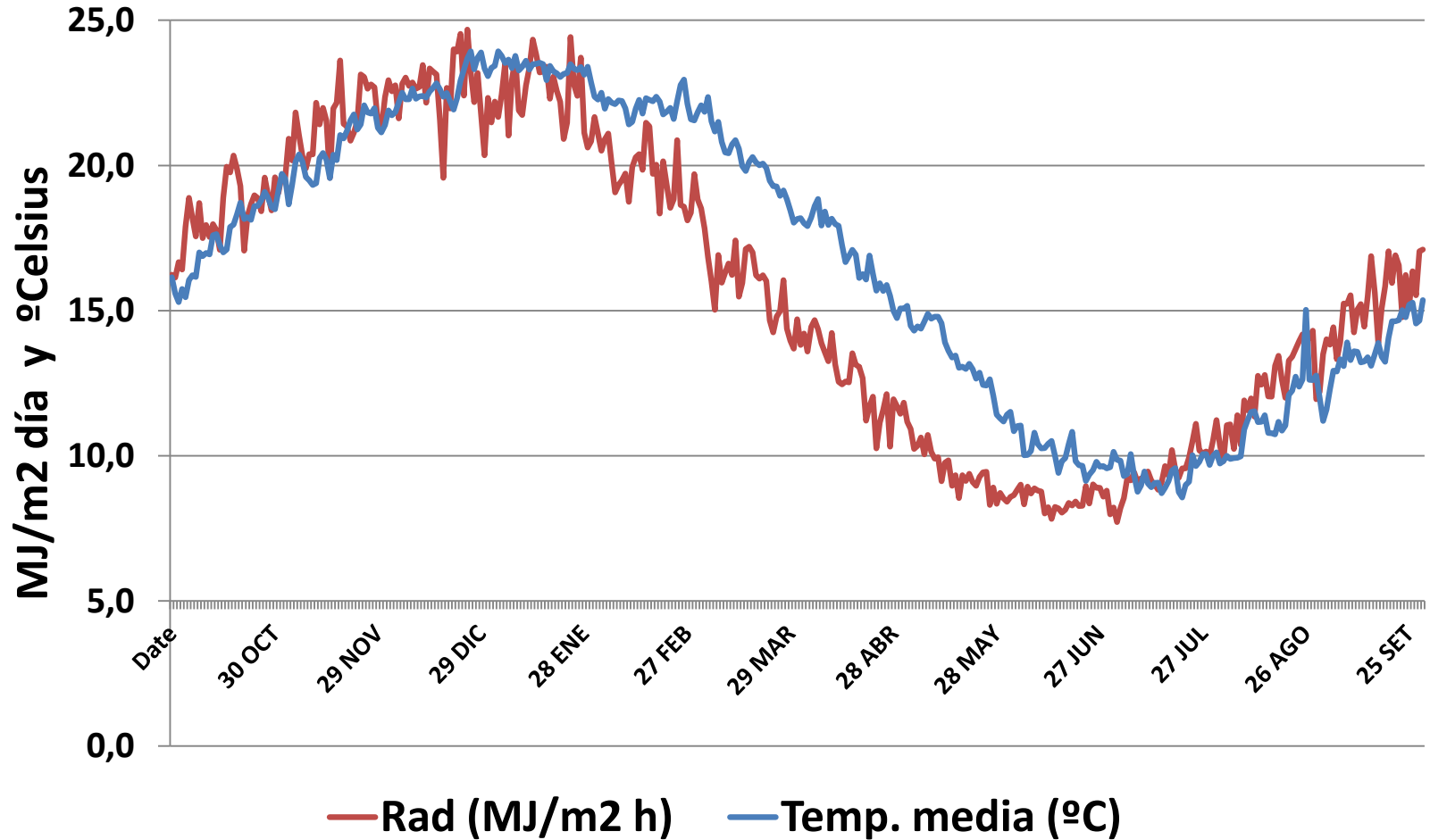
LISTADO DE CULTIVARES DE MANÍ USADOS COMERCIALMENTE (JULIO 2016)

CULTIVAR	TIPO GRANO	ALTO OLEICO	CICLO (DIAS)	NOTAS SANITARIAS DEL CREADOR
AGRATECH 1-1	RUNNER	SI	148	
48	RUNNER	SI	155	
GRANOLEICO	RUNNER	SI	155	
PRONTO (AO)	RUNNER	SI	140	TOLERANCIA A SCLEROTINIA
GUASU (AO)	VIRGINIA	SI	155	
EC-98 (AO)	RUNNER	SI	152	LEVE TOLERANCIA A CARBON
VICTOR ASEM-INTA	RUNNER	SI	155	
ASEM 400 INTA	RUNNER	NO	140	

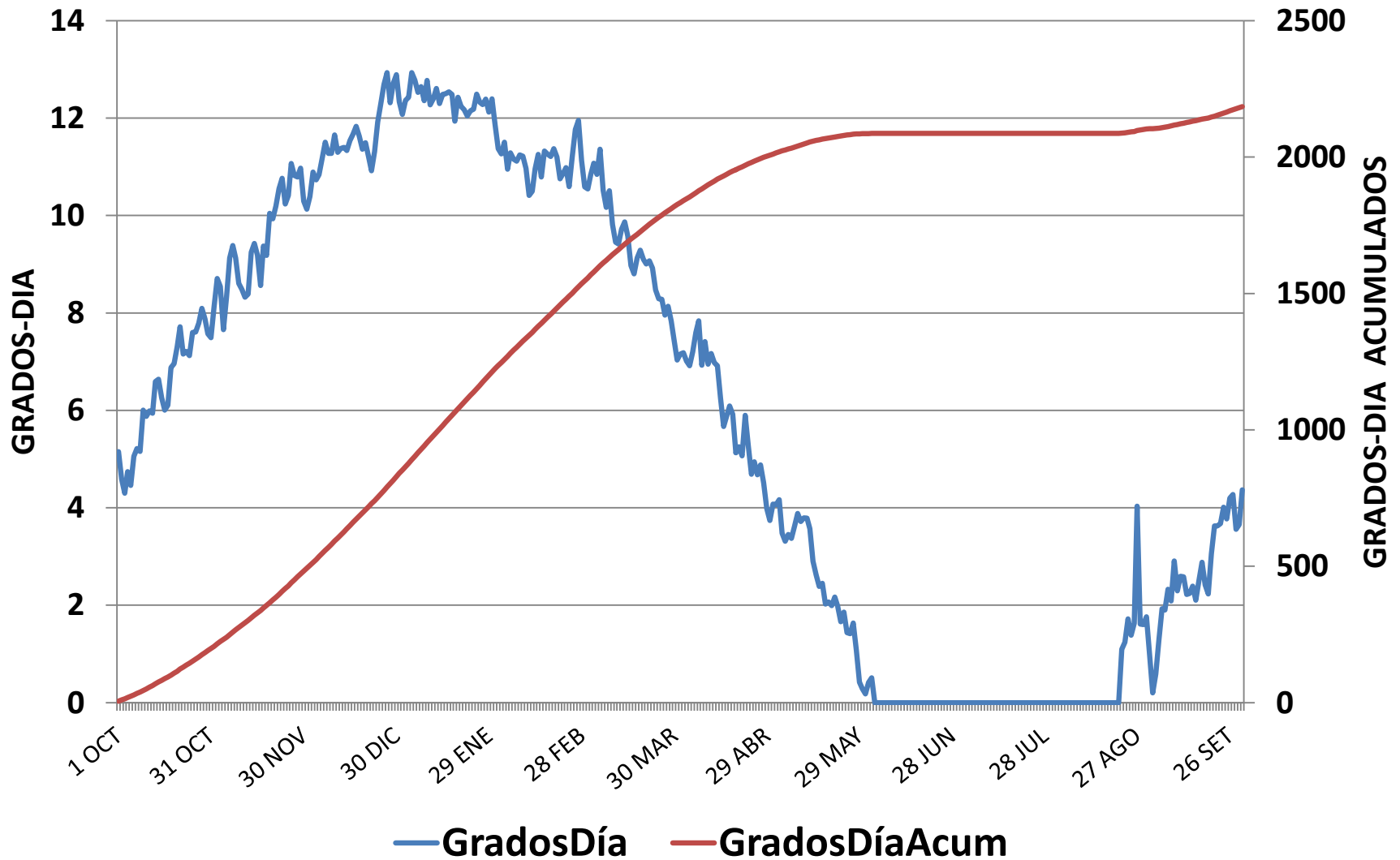
FACTOR IMPORTANTE EN LA ELECCION DE CULTIVARES: OFERTA AMBIENTAL

1. AMBIENTE EN ZONA MANISERA ES MARGINAL PARA LOS RUNNERS
2. POR QUE SE PASO DE SEMBRAR EN NOVIEMBRE A SEMBRAR EN OCTUBRE?
 - a) LOGISTICA: MUCHAS HA
 - b) LLUVIAS DESUNIFORMES: SOLO ALGUNOS LOTES RECIBEN LLUVIAS TEMPRANAS
 - c) CULTIVARES DE CICLO EXCESIVO PARA ZONA MANISERA

RADIACION Y TEMPERATURA HISTORICAS EN MANFREDI



GRADOS-DÍA HISTÓRICOS Y ACUMULADOS EN MANFREDI



POR QUE PRECOCIDAD?

1. EL **DESTINO** DE LOS ASIMILADOS (SEMILLAS)
DIRIGE EL RITMO DE AVANCE DEL CULTIVO
2. CUANTO MAS SEMILLAS SE HAYAN FORMADO
MAS TENDENCIA A FORMAR **FUENTE** (HOJAS)
PARA ALIMENTARLAS (FEEDBACK POSITIVO)
3. CUANTO ANTES GENERE **DESTINO** (CUAJE),
ANTES TENDRE **FUENTE** (HOJAS PRODUCIENDO
ASIMILADOS)
4. AL LLEGAR LA SEQUIA DE ENERO DEBIERA
TENER BUEN NUMERO DE **DESTINOS** FIJADOS

MADUREZ DE VAINAS A COSECHA EN CVS. DE DISTINTO CICLO

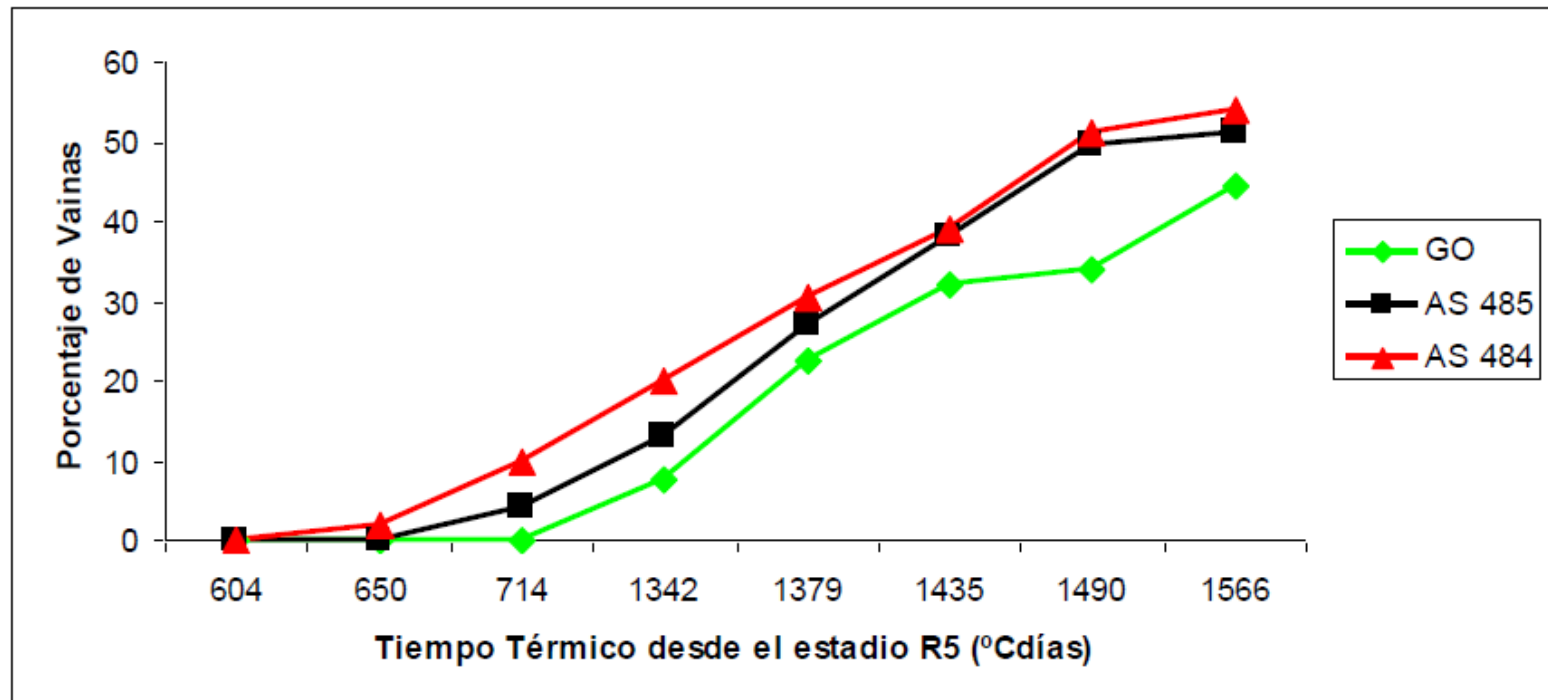


Figura 10: Porcentaje de Vainas que alcanzaron el Estado de Madurez III (Raspado externo de vainas) en función del Tiempo Térmico desde el estadio R5 para tres variedades de maní.

FUENTE: Gamba 2010

MADUREZ DE VAINAS A COSECHA EN CVS. DE DISTINTO CICLO

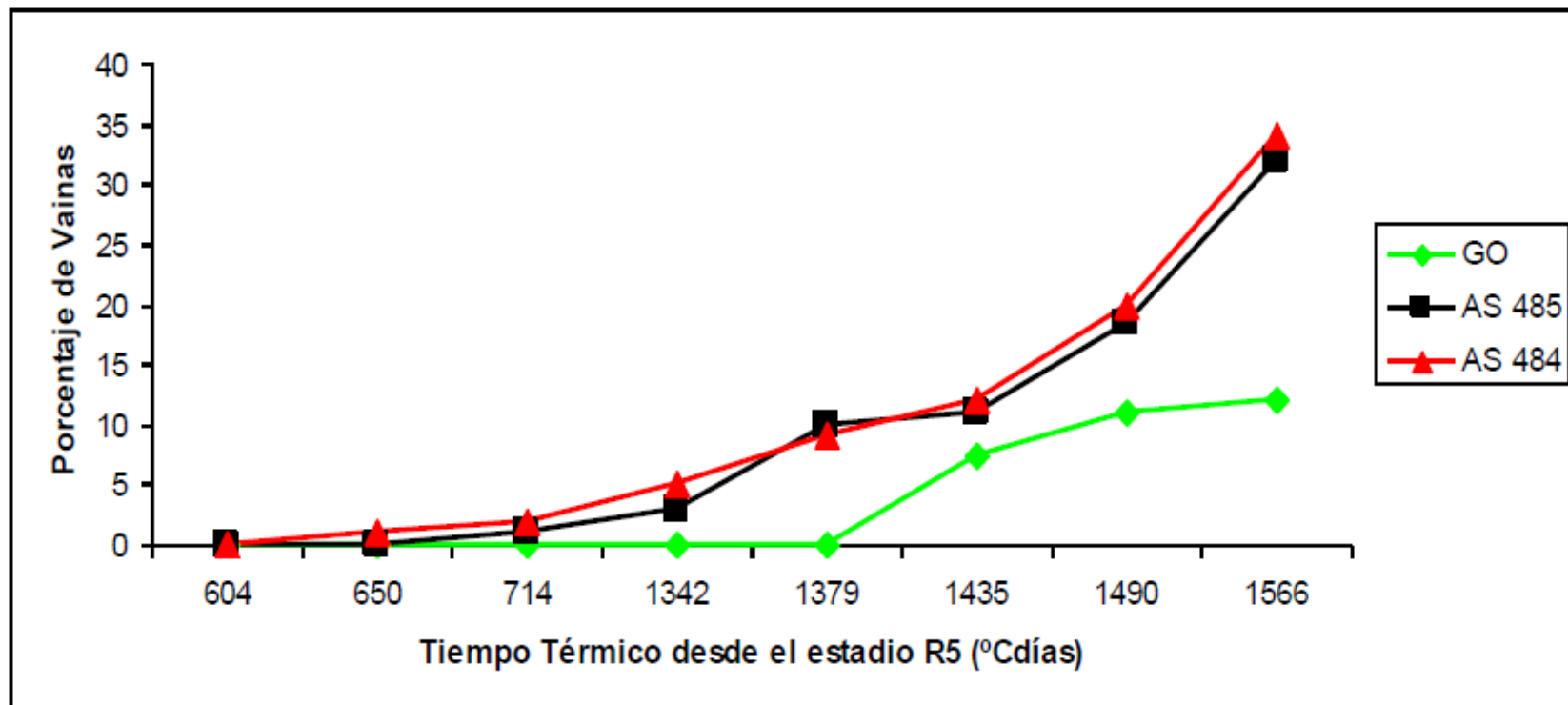


Figura 11: Porcentaje de Vainas que alcanzaron el Estado de Madurez IV (Raspado externo de vainas) en función del Tiempo Térmico desde el estadio R5 para tres variedades de maní.

FUENTE: Gamba 2010

DINAMICA FLORAL EN CULTIVARES DE DISTINTO CICLO



GRANOLEICO, 140 DDS, E.C.R. MOLDES

RESEARCH & DEVELOPMENT BY:



1 ... the pods from that plant. Continue this process until you have 10-20 pods.
2 DETERMINE THE COLOR OF THE MIDDLE HULL.
 The color of the middle hull is revealed by scraping away the outer layer of the hull. The pod should be held so that the beak on the front end of the pod is pointed downward and ...
3 ... the pods from the other ...
4 DETERMINE WHEN TO DIG.
 The leading edge of the profile should be approximately the same angle as the slope line on the board.

WHITE CLASS
 Pods are watery, easily smashed - ...
 Pods will move through this class in 14 to 15 days.

YELLOW I CLASS
 Very light yellow begins to replace ...
 Pods will move through this class in 10 to 14 days.

YELLOW II CLASS
 Yellow in the saddle area ...
 Pods will move through this class in 12 to 14 days.

ORANGE CLASS
 Orange or brownish-orange begins to replace dark yellow in the saddle area ...
 Pods will move through this class in 12 to 14 days.

BROWN CLASS
 Reddish-brown or brown begins to replace rusty-orange in the saddle area ...
 Pods will move through this class in 9 to 12 days.

BLACK CLASS
 Black begins to replace reddish-brown or brown in the saddle area ...
 Pods will move through this class in 8 to 10 days.



20 S. MORICCHETTI - AGD all season

DAYS UNTIL DIGGING 31 28 24 21 17 14 10 7

ASEM 400, 140 DDS, E.C.R. MOLDES

RESEARCH & DEVELOPMENT BY:

DIRECTIONS FOR USE FLOUNDER VARIETY

1 COLLECT THE SAMPLE
The sample must represent the field. If not, then the results will be meaningless. Carefully lift at least five plants from at least three representative areas (a field). Keep samples from each area of the field separate from each other. Start with the plants from one area, make a mental note of the vine condition and check the pod stem strength of the most mature pods. Take

2 DETERMINE THE COLOR OF THE MIDDLE HULL
The color of the middle hull is revealed by scraping away the outer layer of the hull. The pod should be held so that the back of the hull end of the pod is pointed downward and

3 TO DETERMINE WHICH CLASS IT IS IN
Observe the middle hull color. Warnings: Do not use fresh samples. Place pod stems in a color groups. The color

and determine which class it is in. For purposes of this test, pods are divided into three color groups. The color

EARLY ORANGE

LATE ORANGE

in the early or late part of that class (see example). Place the pod on the board in its proper color and structural group.

The color triangles are there to help you determine if the pod is in the early or late part of the class.

4 DETERMINE WHEN TO DIG

The leading edge of the profile should be approximately the same angle as the slope line on the board.

Repeat this process with the samples from the other areas of the field. Representative samples will generally project within a week of each other. The average of the three areas should provide an accurate digging

time approximately 10 days before the date predicted to determine if maturity is proceeding normally. If there is a significant difference between the two predicted digging dates, then take a third sample test immediately. If an adequate sample was taken and the pods accurately separated into maturity groups, the board will put you within the optimum week.

This method requires hands-on experience to accurately categorize pods and read the profile. This can be best accomplished under the supervision of your Georgia County Extension Agent.



Days to spray season



S. MORICETTI - AGD

GRANOLEICO, 140 DDS, E.C.R. SARMIENTO



ASEM 400, 140 DDS, E.C.R. SARMIENTO


1 COLLECT THE SAMPLE
The sample must represent the field. If not, then the results will be meaningless. Carefully lift at least five plants from at least three representative areas in the field. Keep samples from each area of the field separate from each other. Start with the plants from one area, make a mental note of the vine condition and check the pod stem strength of the most mature pods. Take

2 DETERMINE THE COLOR OF THE MIDDLE HULL
The color of the middle hull is revealed by scraping away the outer layer of the hull. The pod should be held so that the beak on the front end of the pod is pointed downwards and


3 SEPARATE THE PODS ACCORDING TO COLOR
Observe the color of the middle hull layer as the outer layer is scraped away. Warning: be sure to use a fresh sample, because the color may change slightly as the hulls dry out. Place pods within the color groups. First look at the

4 DETERMINE WHEN TO DIG
The leading edge of the profile should be approximately the same angle as the slope line on the board

PEANUT PROFILE BOARD



EARLY ORANGE



LATE ORANGE

It is not a similar slope you may need to adjust a few pods to obtain this slope. This should not require the movement of more than 8 pods.

Read days until digging date using the first column on the right hand side of the board which has a height of three pods (note the projection line).

Repeat this process with the samples from the other areas in that field. Representative samples will generally project within a week of each other. The average of the three areas should provide an accurate digging date for that field.

Each field should be sampled at approximately 10 day's intervals during the digging date. Then sample the second time approximately 10 days before the date predicted to determine if maturation is proceeding normally. If there is a significant difference between the two predicted digging dates, then take a third sample test immediately. If an adequate sample was taken and the pods accurately separated into maturity groups, the board will put you within the optimum week.

When the pods are laid out on the board, they show a profile of how the crop was set and is developing. Generally, pod set will start off slow, rise to a peak and fall off again. When drought or other causes have interrupted normal pod development, it's reflected in the profile by dips in one or more of the pod groups.

This method requires hands-on experience to accurately categorize pods and read the profile. This can be best accomplished under the supervision of your Georgia County Extension Agent.

YELLOW 1 CLASS
Very light yellow begins to replace white in the saddle area and progresses over white until the entire scraped area appears light yellow. Pods are springy when pinched between thumb and forefinger. Pods will move through this class in 10 to 14 days.


YELLOW 2 CLASS
Light yellow begins to replace light yellow in the saddle area and progresses over light yellow until the entire scraped area appears dark yellow. Pods are firm and they yellow. Lard are becoming firm. There is a crunchy sound as the pod is pinched. Pods will move through this class in 10 to 14 days.

ORANGE CLASS
Orange or brownish orange begins to replace dark yellow in the saddle area and progresses over dark yellow until the entire scraped area appears rusty-orange. Pods will move through this class in 12 to 14 days.

BROWN CLASS
Reddish-brown or brown begins to replace rusty orange in the saddle area and progresses over rusty orange until the entire scraped area appears reddish brown or brown. Pods will move through this class in 9 to 12 days.

BLACK CLASS
Black begins to replace reddish-brown or brown in the saddle area and progresses over reddish brown or brown until the entire scraped area appears black. Pods will move through this class in 7 to 11 days.

Harvestable Pods



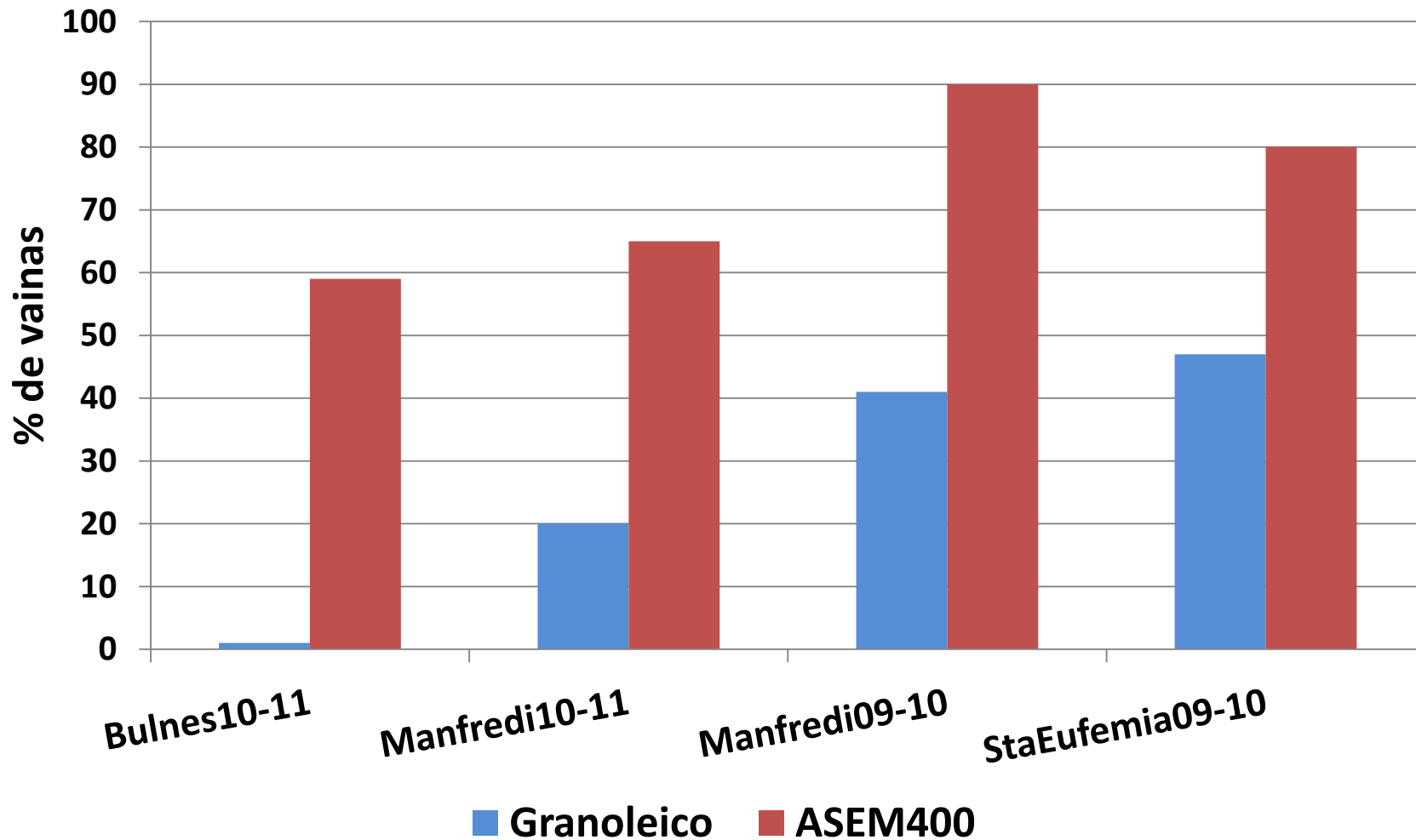
Slope

Projection Line

S. MORICHETTI - AGD **DAYS UNTIL DIGGING**

31	28	24	21	17	14	10	7	3
----	----	----	----	----	----	----	---	---

PORCENTAJE DE VAINAS CATEGORÍAS III-IV EN 2 CULTIVARES EN ENSAYOS REGIONALES CONVENIO ASEM-INTA



MANEJO DE CULTIVARES DE CICLO INTERMEDIO

POR SU MADUREZ REQUIEREN MUESTREOS SEMANALES DESDE LOS 120 DÍAS PORQUE PUEDEN MOSTRAR SOBREMADUREZ (R9)

QUIENES ELIGEN Y POR QUE ELIGEN UN CULTIVAR?

- EN GENERAL EL SISTEMA DE PRODUCCION ARGENTINO IMPLICA INTEGRACION VERTICAL Y LA INTERACCION DE LAS PARTES DETERMINA LA ADOPCION DE UN NUEVO CULTIVAR

SELECCIONADORAS INTEGRADAS VERTICALMENTE

• GRUPO DE PRODUCCION

1. CLIMATICOS

- a) QUE HAGA USO EFICIENTE DE RECURSOS CLIMATICOS
 - i. BUENA TASA DE CRECIMIENTO INICIAL DEL CULTIVO (CUBRE RAPIDO)
 - ii. BUENA PARTICION DE FOTOASIMILADOS POR FIJACION TEMPRANA DE DESTINOS (MAS VA A LOS GRANOS Y MENOS A LA PARTE AEREA)
 - iii. TOLERE PERIODOS DE SECA

SELECCIONADORAS INTEGRADAS VERTICALMENTE (Cont.)

• GRUPO DE PRODUCCION (Cont.)

2. SANITARIOS

- a) TOLERANCIA A PATOGENOS HISTORICOS DEL LOTE
(SCLEROTINIA PARTICULARMENTE)
- b) POSIBILIDADES DE ESCAPE POR CICLO
- c) EVITAR ALTA SUSCEPTIBILIDAD A VIRUELA

SELECCIONADORAS INTEGRADAS VERTICALMENTE (Cont.)

• GRUPO DE PRODUCCION (Cont.)

3. LOGISTICOS

- a) QUE TENGA AMPLIA VENTANA DE SIEMBRA
- b) QUE A COSECHA SE OBTENGAN BUENOS NIVELES DE MADUREZ, QUE ASEGUREN BUENA GRANOMETRIA Y CALIDAD QUIMICA
- c) QUE LLEGUE A COSECHA CON BUEN ESTADO DE PLANTA PARA MEJORAR EL ARRANCADO
- d) QUE TOLERE COSECHA ANTICIPADA POR PROBLEMAS SANITARIOS
- e) QUE NO TENGA CLAVO FRAGIL
- f) QUE ESTE LISTO PARA ARRANCAR CUANDO LA LOGISTICA ES ADECUADA
- g) QUE PERMITA REALIZAR TAREAS DE ARRANCADO Y DESCAPOTADO EN TIEMPO Y FORMA, **PREFERENTEMENTE ESCALONADAS**

SELECCIONADORAS INTEGRADAS VERTICALMENTE (Cont.)

• GRUPO DE INDUSTRIALIZACION: PLANTEROS

1. PREVISIBLE:

- a) PROCESAMIENTO SIMILAR ENTRE CAMPAÑAS Y LOTES
- b) CALIDAD Y CANTIDAD ESPERADAS PROVENIENTES DE LOS PRODUCTORES
- c) INGRESO ESCALONADO DE LOS LOTES (***EVITA ESPERAS DE DESCARGA EN PLANTA***)

2. QUE SEA SIMPLE DE PROCESAR:

- d) QUE NO SE ABRA LA VAINA DURANTE EL TRANSPORTE
- e) QUE NO SEA MUY CASCARUDO
- f) QUE LA VAINA NO SE PARTA POR LA CINTURA AL PROCESAR
- g) QUE NO SE PARTA EL GRANO AL PROCESAR
- h) QUE NO SE PELE EL GRANO POR SI SOLO PERO QUE SE PELE BIEN AL BLANCHEAR
- i) QUE TENGA POCA VARIABILIDAD DENTRO DE CADA CALIBRE (SEMILLA PEQUEÑA LLENA VS SEMILLA GRANDE CHUZA)

SELECCIONADORAS INTEGRADAS VERTICALMENTE (Cont.)

- **GRUPO DE INDUSTRIALIZACION: ELABORADORES**

1. ADECUADO:

- a) AL PRODUCTO A ELABORAR
- b) AL MERCADO AL QUE VA DIRIGIDO

2. PREVISIBLE:

- c) CALIDAD DEL INSUMO
- d) COMPORTAMIENTO DURANTE LA ELABORACION
- e) CALIDAD DEL PRODUCTO ELABORADO

SELECCIONADORAS INTEGRADAS VERTICALMENTE (Cont.)

- **GRUPO DE INDUSTRIALIZACION: COMERCIAL**

1. ADECUADO A GUSTO/NECESIDADES DEL COMPRADOR
2. COSTO DE PRODUCCION (PRODUCTIVIDAD FISICA)
3. PREVISIBLE:
 - a) CALIDAD Y CANTIDAD DE MERCADERIA A NEGOCIAR ANTICIPADAMENTE

GENETICA MANISERA QUE VIENE

- LOS MEJORADORES GENERAN GRAN NUMERO DE NUEVOS MATERIALES
- SOLO UNOS POCOS ALCANZAN NIVELES PRODUCTIVOS (CANTIDAD Y CALIDAD) SUPERIORES A LO EXISTENTE EN MERCADO
- EL MOMENTO DE ENTRADA AL MERCADO DEBE SER EL ADECUADO
 - INTERVALO ENTRE INSCRIPCIONES NO MUY CORTO
 - LOS USUARIOS DEBEN ESTAR DISPUESTOS A PROBAR LOS NUEVOS MATERIALES

PORCENTAJE DE MEJORA
DE LOS CULTIVARES **ASEM-INTA**
RESPECTO DE GRANOLEICO
(PROMEDIO DE 24 AMBIENTES-ENSAYOS REGIONALES
ASEM-INTA)

	RENDIMIENTO	REND. CONFITERÍA	REND. 40/50	GRANO/CÁSCARA
VICTOR ASEM-INTA	+ 2	+ 2	+ 1	- 1
ASEM 400 INTA	+ 18	+ 26	+ 30	+ 3

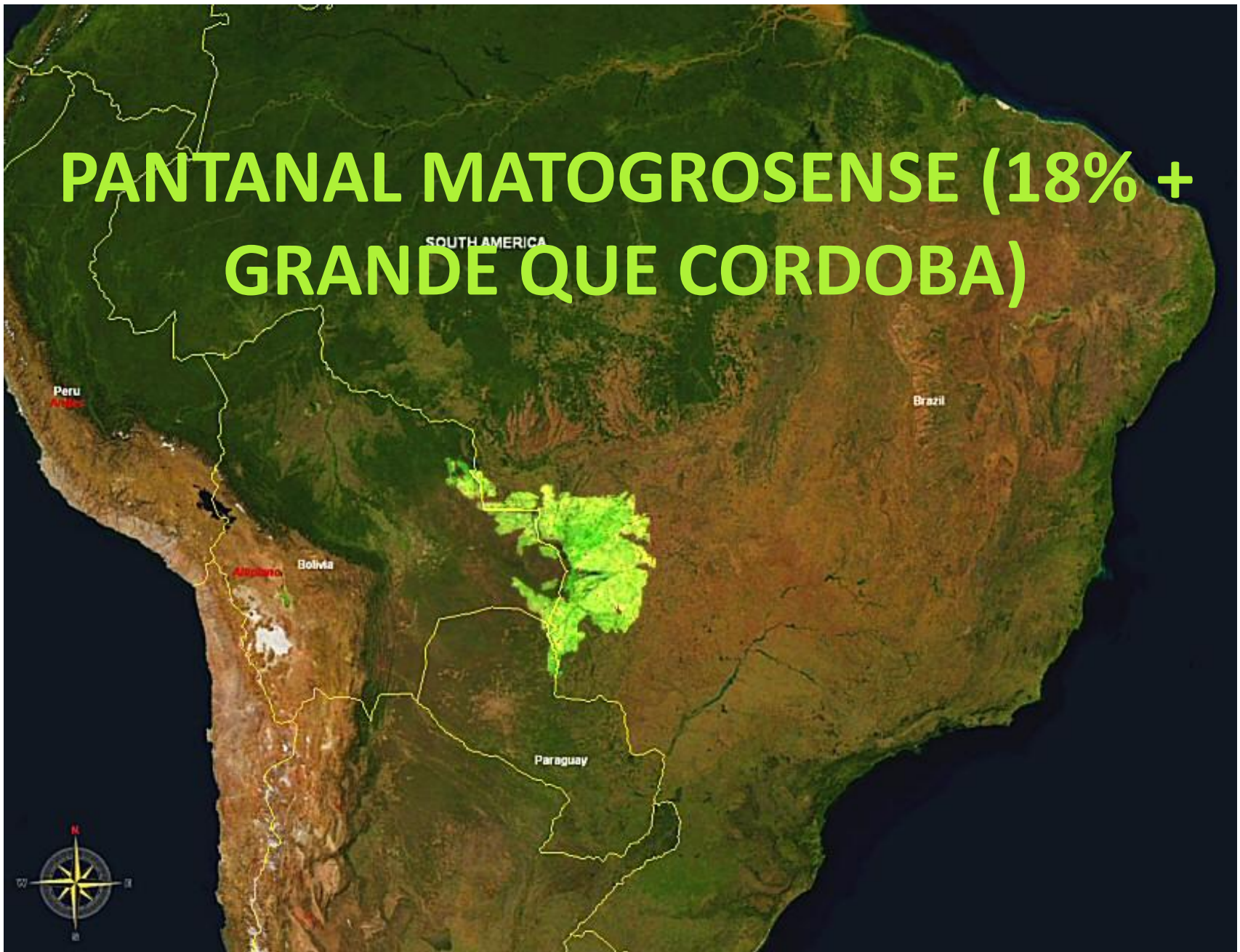
PIPELINE DE PRODUCTOS **ASEM-INTA**

- STANDARD PRODUCTIVO: **ASEM 400 INTA**
- LINEA MAS RENDIDORA EN PROCESO DE MULTIPLICACION
- LINEA MAS RENDIDORA Y TOLERANTE A SCLEROTINIA EN PROCESO DE DESCRIPCION
- MATERIALES EN PROCESO DE SELECCIÓN CONTENIENDO GENES PARA RESISTENCIA A NECROTROFOS Y MELOIDOGYNE ARENARIA

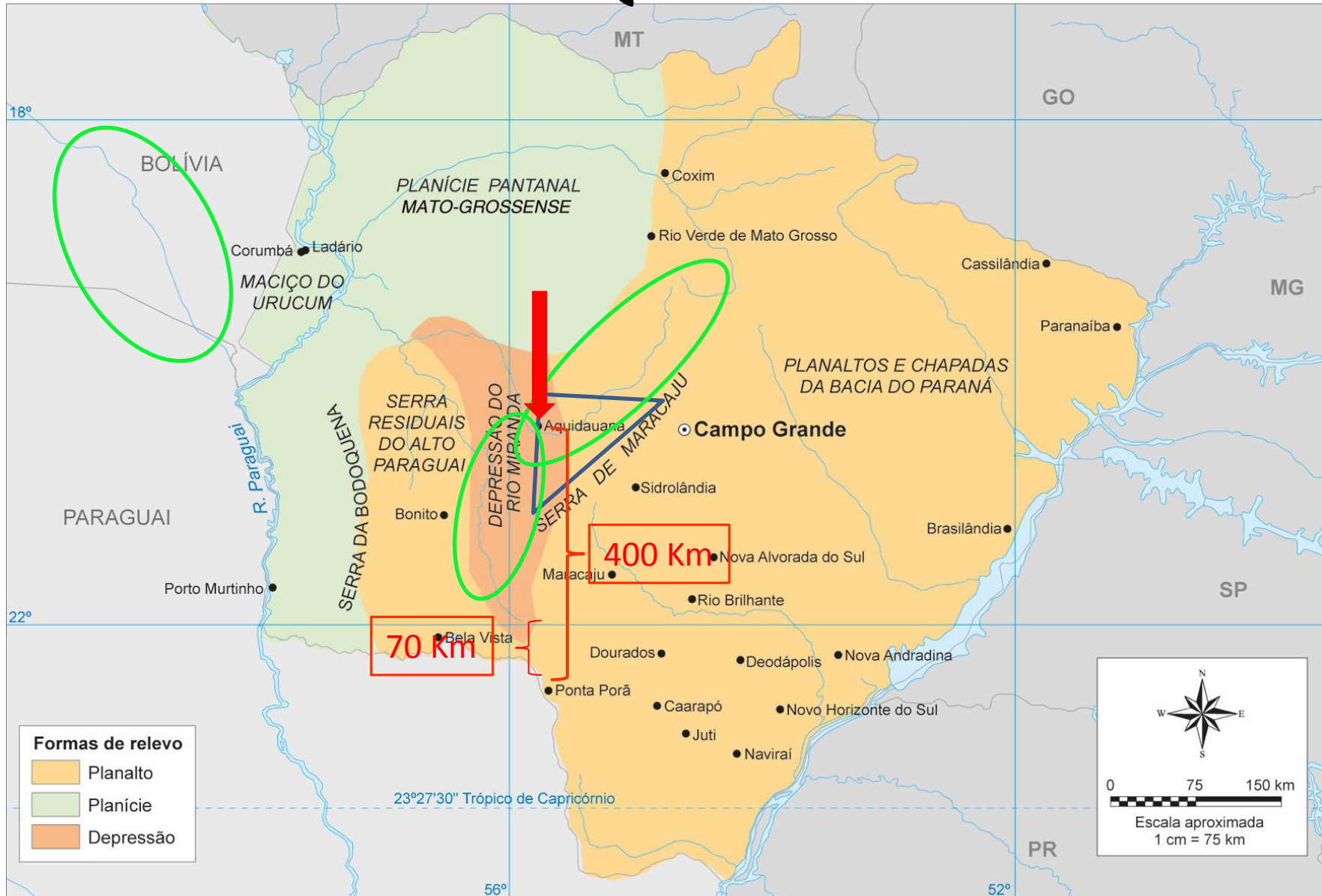
Y AHORA LA DEL MIEDO



PANTANAL MATOGROSENSE (18% + GRANDE QUE CORDOBA)



Y ME DECIS QUE NO TIENEN?!





**DISTRIBUCION DE
A. KUHMANNII**

**ÁREAS INUNDÁVEIS
BACIA DO ALTO PARAGUAI NO BRASIL**

- Capitais
- Cidades > ou = 20.000 hab.
- Outras Cidades
- Limite Estadual
- - - Limite Internacional
- Limite da Bacia
- Limite do Pantanal
- Pantanal

Inundação Generalizada

Altura	Duração
Alta	Longa
Alta-Média	Longa
Média-Alta	Longa-Média
Média-Alta	Média-Curta

Inundação Parcial

Altura	Duração
Média	Média-Longa
Média	Média
Baixa	Curta

Inundação Localizada

Altura	Duração
Baixa	Curta

● Arambado



CARRERA COEVOLUTIVA HOSPEDANTE-PATOGENO






RESISTENCIA VS TOLERANCIA

RESISTENCIA: ESTABLECIMIENTO DEL PATOGENO EN EL HOSPEDANTE ES NULO O MUY REDUCIDO.

TOLERANCIA: EL HOSPEDANTE SE DESARROLLA Y PRODUCE BIEN AUN HABIENDOSE ESTABLECIDO EL PATÓGENO DE MANERA CLARA.

COMPARICION ENTRE AMBOS TIPOS DE RESISTENCIAS A ENFERMEDADES

Característica	Resistencia Vertical	Resistencia Horizontal
Especificidad Fenotipica	Específica 	No Específica
Naturaleza de la acción génica	Oligogénica	Poligénica, raramente oligogénica
Respuesta al patógeno	Usualmente hipersensitiva 	Resistente
Expresión Fenotípica	Cualitativa 	Cuantitativa
Estadíos de expresión	Plántula hasta madurez	Expresión aumenta hasta la madurez
Selección y evaluación	Fácil 	Difícil

COMPARICION ENTRE AMBOS TIPOS DE RESISTENCIAS A ENFERMEDADES

Característica	Resistencia Vertical	Resistencia Horizontal
Desarrollo de variedades específicas para razas ?	Fundamental (especialmente en patógenos móviles)	Innecesaria
Necesidad de otras medidas de control ?	Probable	Improbable
Interacción hospedante-patógeno	Presente	Ausente
Eficiencia	Altamente eficiente contra raza específica	Variable pero sirve para todas las razas
Términos similares	Genes mayores, raza/patotipo específica, monogénica, diferencial	Poligénica, raza/patotipo no específica, de planta adulta, de campo, uniforme

CEBADAS CON RESPUESTAS DIFERENCIALES (ESPECIFICIDAD) A 1 RAZA DE ROYA

1
GENO-
TIPO
INMU-
NE

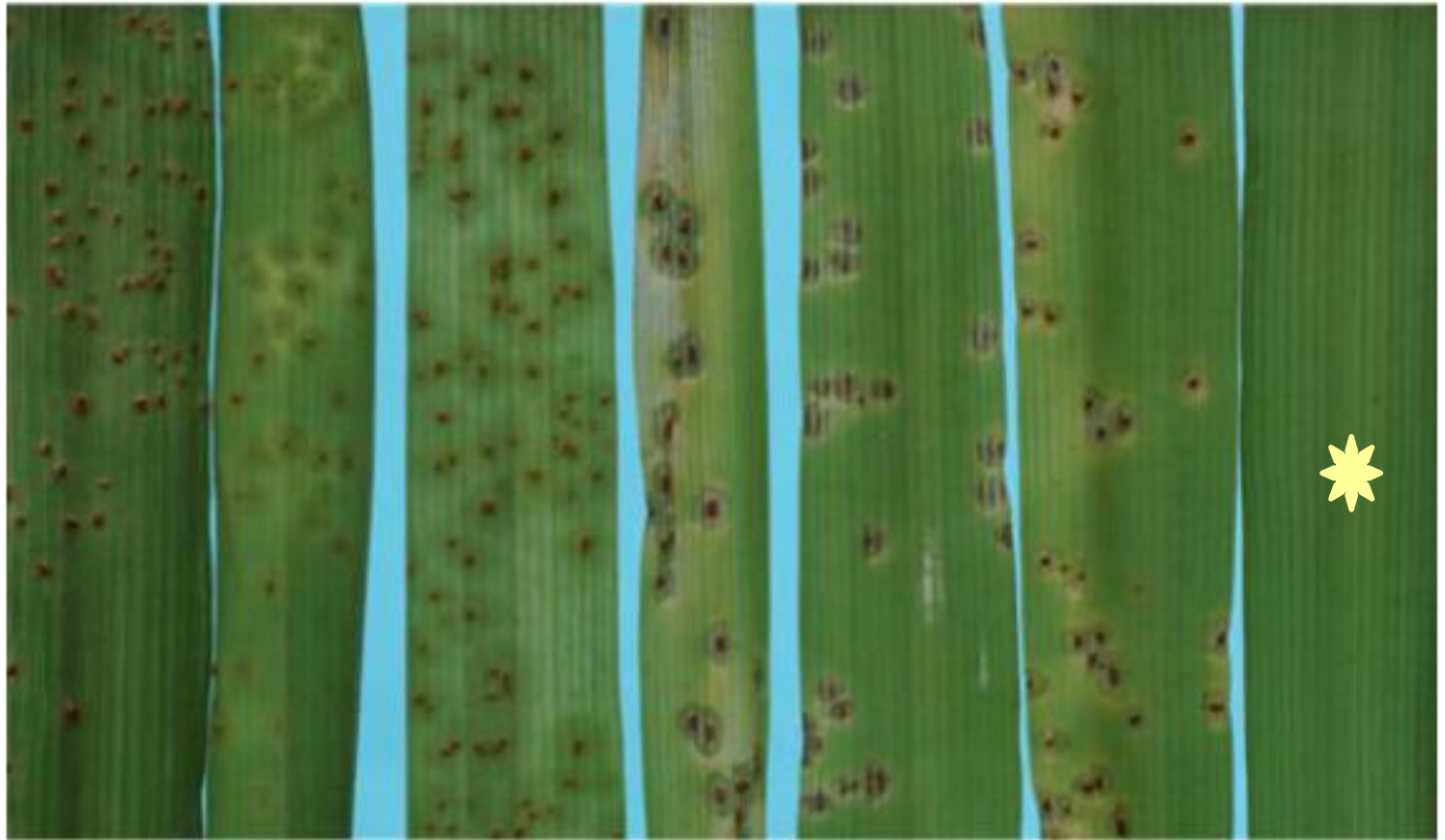
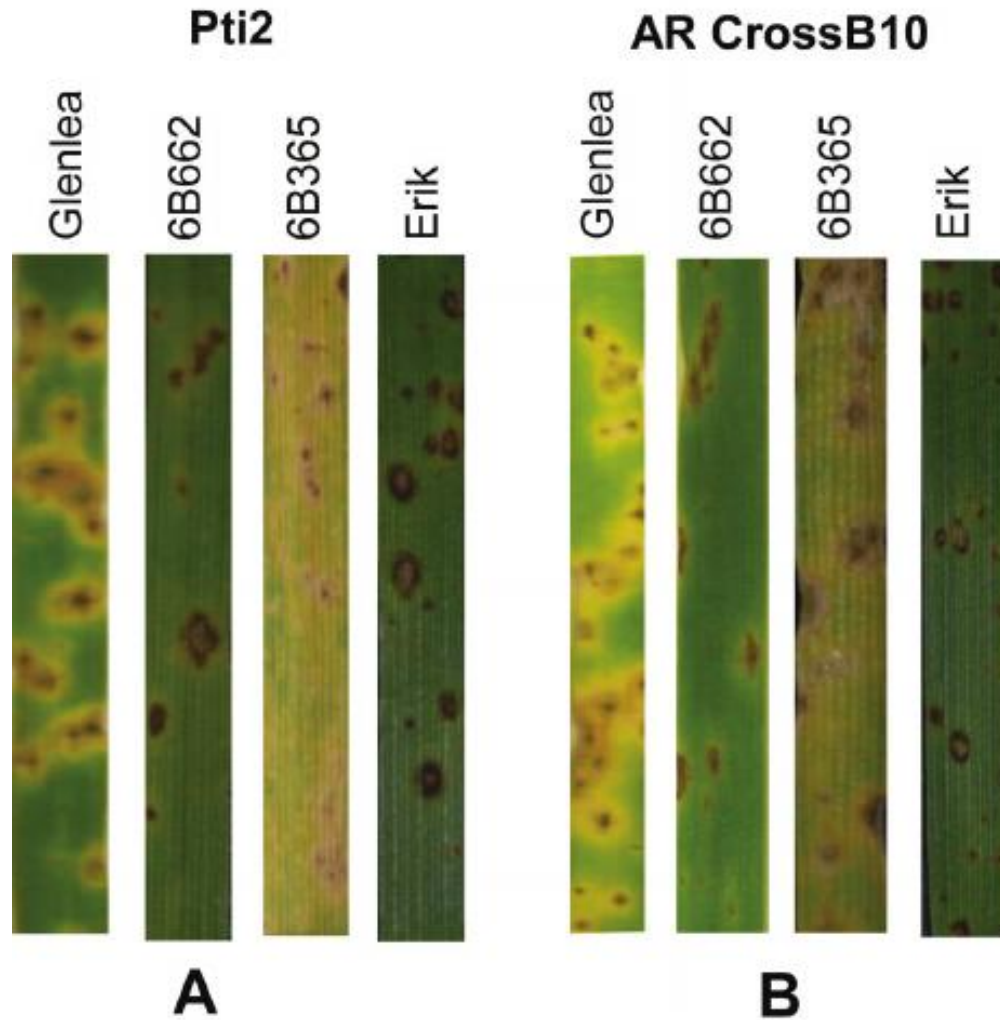


Figure 2. Rust response of control lines against *Puccinia hordei* pathotype 5457P⁺ L to R: Gus (3+), Ricardo (11+2C), Estate (*Rph3*, 3+), Egypt 4 (*Rph8*, 1++CN+), Cebada Capa (*Rph7*, ;N), 81882/BS1 (*Rph17*, ;1-C) and 38P18/8/1/10 (*Rph18*, 0;=)

REACCION DIFERENCIAL DE TRIGOS A 2 RAZAS DE MANCHA AMARILLA



SET DE CVS. DIFERENCIALES PARA DETERMINAR RAZAS DE ROYA DEL TALLO EN TRIGO



ISr5-Ra



CS_T_mono_deriv



Vernstein



ISr7b-Ra



ISr11-Ra



ISr6-Ra



ISr8-Ra



CnsSr9g



W2691SrTt-1



W2691Sr9b



BtSr30Wst



Combination VII



ISr9a-Ra



ISr9d-Ra



W2691Sr10



CnsSrTmp



LcSr24Ag



Sr31/6*LMPG



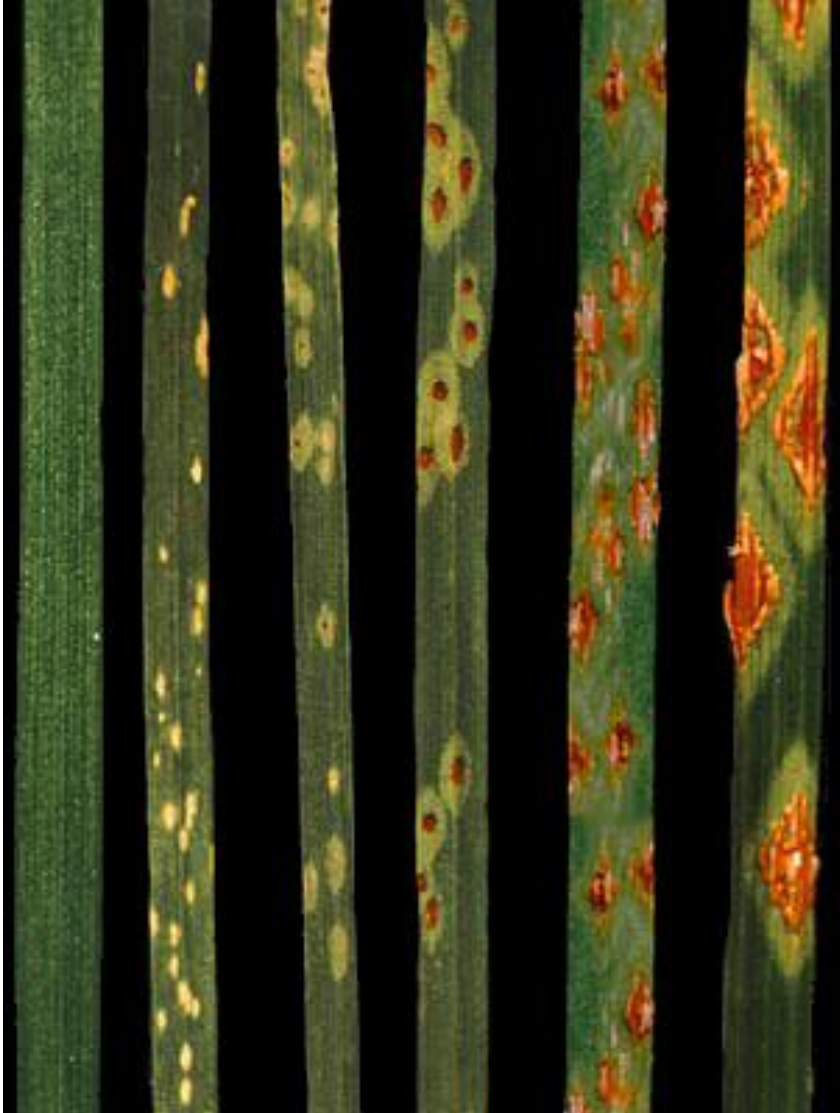
RL 6081-1



Bt/Wld



RESPUESTA HIPERSENSITIVA (INMUNIDAD)



- ✓ EJ. TÍPICO: ROYA DEL TALLO EN TRIGO
- ✓ MUERTE CELULAR PROGRAMADA
- ✓ CRECIENTE COMPRENSIÓN DE FENÓMENOS CELULARES
- ✓ PROCESOS DE RECONOCIMIENTO DEL PATÓGENO, PROTEÍNAS DE SEÑALIZACIÓN Y FACTORES DE TRANSCRIPCIÓN, AUN EN ESTUDIO

RESPUESTAS HIPERSENSITIVAS DE MAÍCES A *Puccinia sorghi*

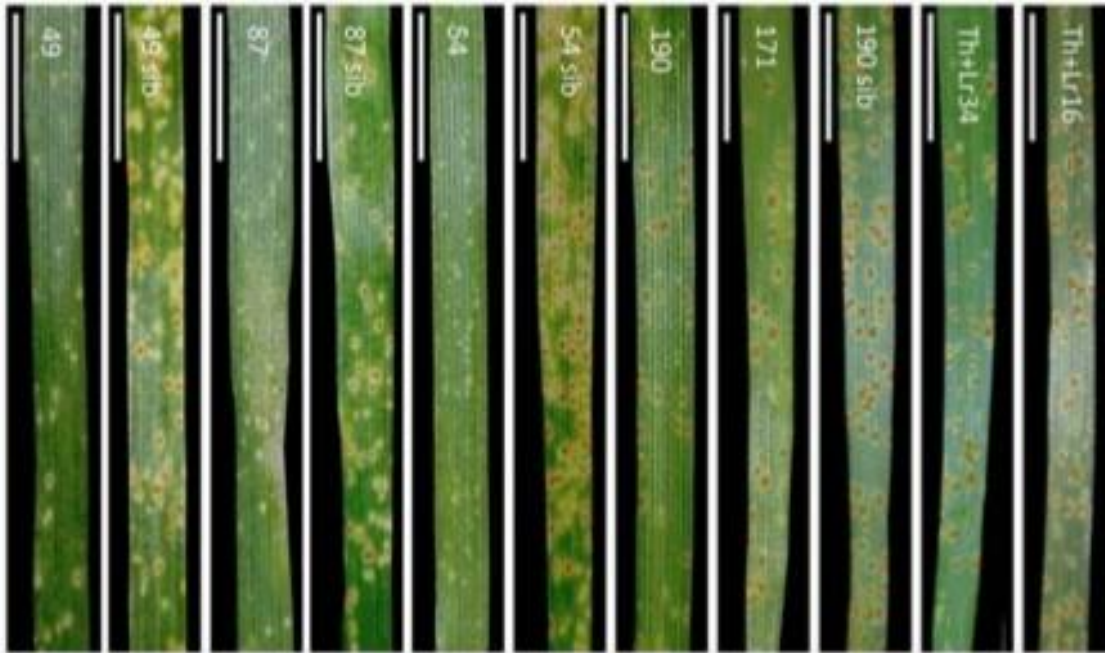


NIVELES DE
RESISTENCIA A
DOS
AISLAMIENTOS
DE ROYA DE LA
HOJA EN
TRIGOS

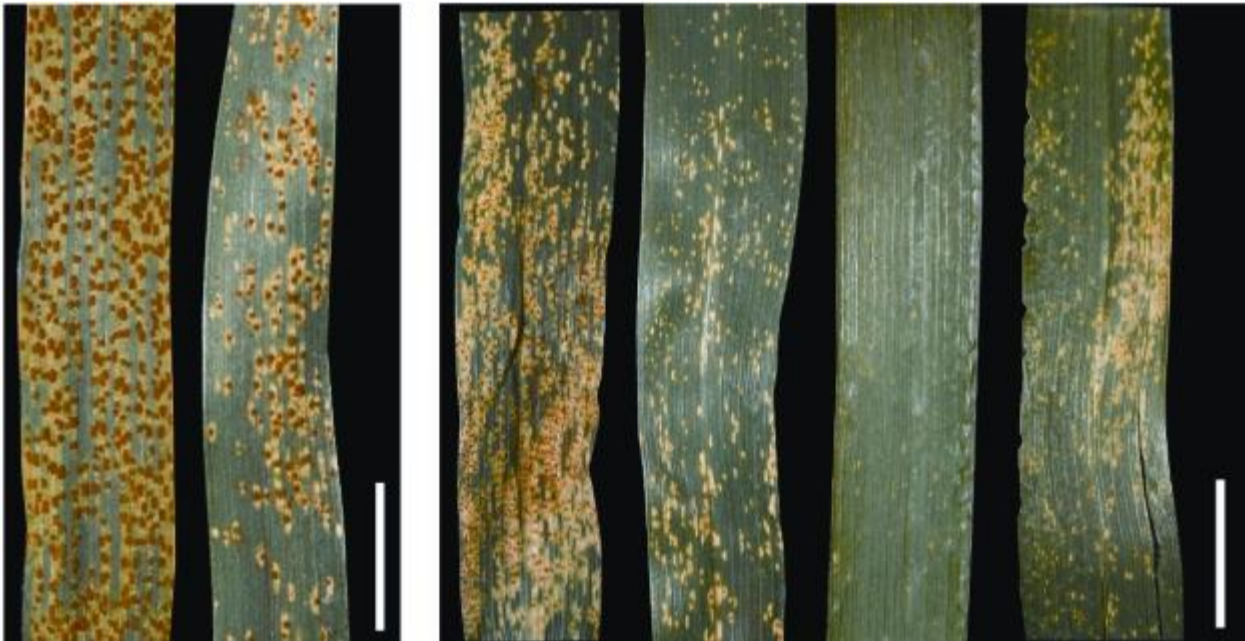


Figure 1 - Leaf rust reaction on flag leaves of double haploid plants. A, B and D - different levels of resistance; C - susceptibility.

NIVELES DE RESISTENCIA A ROYA DE LA HOJA EN CEBADA



NIVELES DE RESISTENCIA A ROYA EN MAIZ





**TRIGOS CON DISTINTA RESPUESTA A
VIRUS DEL MOSAICO ESTRIADO**

TRIGOS CON DISTINTA RESPUESTA A ROYA AMARILLA



100 AÑOS DE EXPERIENCIA

- **HAY RESISTENCIA?**
- **RESISTENCIA, INMUNIDAD, TOLERANCIA**
- **CUAL ES EL TIPO DE VARIABILIDAD EN PROGENIES R_xS?**
 - **DISCRETA: SUGIERE 1 O POCOS GENES Y POCA INCIDENCIA AMBIENTAL**
 - **CONTINUA: SUGIERE MUCHOS GENES Y/O ALTA INCIDENCIA AMBIENTAL**
- **DETERMINAR HERENCIA (NUMERO DE GENES, EXISTENCIA DE ALELOS) Y ACCION GENICA (DOMINANCIA, ADITIVIDAD)**
- **MAPEO CROMOSOMICO DE GENES (SNPs, GISH, ASSOCIATION ANALYSIS AND COMPOSITE INTERVAL MAPPING)**
- **IDENTIFICACION FISICA DEL GEN Y POSTERIOR DESARROLLO DE MARCADORES FLANQUEANTES**
- **ESTUDIO DE LA FUNCION FISIOLÓGICA DEL GEN DE RESISTENCIA (CLONADO Y ANALISIS TRANSCRIPCIONALES)**

PROPUESTAS PARA MINIMIZAR POSIBILIDADES DE APARICIÓN DE NUEVAS RAZAS EN DISTINTOS TIPOS DE PATOGENOS

- **ALTERNAR ESPACIAL Y TEMPORALMENTE CULTIVARES RESISTENTES Y SUSCEPTIBLES (PATOGENOS POCO MOVILES)**
- **EN PATOGENOS MOVILES:**
 - **MEZCLAS DE GENOTIPOS RESISTENTES Y SUSCEPTIBLES**
 - **MULTILINEAS CON DISTINTOS GENES DE RESISTENCIA**
 - **APILAMIENTO DE GENES DE RESISTENCIA EN UNA MISMA LINEA Ω**

TRABAJEMOS PARA HACER CRECER EL MANI ARGENTINO!

