One hundred years of some specialty legume genetic resource contributions and future considerations

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Abstract

The NPGS specialty legume curation project includes about 60 genera, 358 species, and 3604 accessions. Historical agricultural value of legumes for cover cropping, forage, yield, and disease resistance is known. However, added value from specialty legumes are needed. Currently, specialty legume research has focused on variability for various phytochemicals and pest control. Many underutilized, specialty legumes are potentially valuable for uses such as biomass for fuel, urease for fuel cells, biological control, nutraceuticals, and medicines in the future.

NPGS accessions used (pedigree) for cultivar development.

Cultivar	Pedigree	Developer (reference)	Use
Alysicarpus vaginalis			
FL-5	PI 217904	4	Cover crop
Cyamopsis tetragonoloba			
Kinman	Brooks x Mills	1	Early maturity, yield
Esser	Brooks, Mills, Kinman	1	Disease tolerance
Mills	PI 263875	2	Disease resistance
Hall	PI 179930	2	Disease resistance
Desmanthus illinoensis			
Sabine	PI 434011	20	Wildlife
Indigofera hirsuta			
Flamingo	PI 213523	5	-
Kummerowia stipulacea			
Summit	NSSL 42781(f)	22	Forage
Yadkin	PI 593053 (f)	8	Tar spot resistance, yield, forage
Lespedeza cuneata			
Au Donnely	NSSL 43596 (bc)	19	Low tannin
Leucaena leucocephala			
Hawaiian giant K8	PI 263695	7	Forage
L. spp.			
UH 103	PI 286223 x PI 288000	25	Chromosome range 60-90
Macroptilium atropurpureum			
IRFL 4655	PI 543311	17	Disease resistance, yield

Several cultivars were developed from many specialty legume species including (see reference for developer):

-*Alysicarpus vaginalis*, FL-3 (6); alyceclover (12).
-*Cyamopsis tetragonoloba*, Lewis, Cruz (3).
-*Desmodium heterocarpon*, Florida (16).
-*Indigofera hirsuta*, Early, Late (13).
-*Kummerowia stipulacea*, Rowan, Climax (15).
-*K. striata*, Marion (26); kobe (23).
-*Lablab purpureus*, Lablab (24); Tift-1 (18).
-*Lespedeza cuneata*, serala (9).
-*Mucuna pruriens*, Florida (10); Osceola, Alachua, Wakulla (11).
-*Stylosanthes guianensis*, Savanna (14).
-26 including 1 *Aeschynomene americana*, 3 *Chamaecrista fasciculata*, 1 *Crotalaria juncea*, 2 *Desmanthus illinoensis*, 3 *Desmodium* spp., 1 *Indigofera hirsuta*, 13 *Lespedeza* spp., 1 *Neonotonia wightii*, and 1 *Strophostyles helvula* (21).

Current

Indigofera nummularifolia, PI 189493 and *Canavalia ensiformis*, PI 164695 reduced root-knot nematode galls by 82 and 75%, respectively. (27).

Canavalia ensiformis

I.ndigofera nummularifolia

Velvetbean, *Mucuna* spp., L-dopa for antiparkinsonian, ozone resistance

Historical

Senna alexandrina, sennosides used in laxatives

Underutilized legumes for future considerations

Siratro, *Macroptilium atropurpureum* - forage for Georgia

Senna occidentalis habitat for predators

Stylosanthes hamata, erosion control

Winged bean, *Psophocarpus tetragonolobus*, edible vegetable, nutraceuticals

Lablab purpureus, 1246 lectin for healthy cell protection during chemo

Ornate moth on *Crotalaria incanum*

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