

# Unconventional Legumes for Sustainable Farming Systems

## Steve Temple, June 2010

### **Conventional Legumes:**

#### Winter:

- Garbanzo (chickpeas). Strong N fixation with inoculation, low water demand, requires weed control and management of *Ascochyta* blight and SCM.

#### Summer:

- Large and Baby Lima (Vine and Bush varieties). Good N fixation with inoculation, modest water demand, resistant to RKN and some Lygus.
- Blackeye Cowpea. Strong N fixation with inoculation, resistant to RKN and *Fusarium*, requires Lygus management.
- Common Bean Classes (LRK, DRK, Yellow, Pinto, Black Turtle, many others). Variable N fixation (maturity and PGH), modest water demand, few pest/disease problems.

### **Unconventional Crop Legumes:**

#### Winter:

- Grain Lupin. N fixation, low water. Requires weed control, good drainage, some insect/disease mgmt., and anti-dehiscent material, careful harvesting. SCM.
- Lentils. Slow growing, weed mgmt. issues.
- Others: Peas, Faba beans, scarlet runner, forage mixes.

#### Summer:

- Pigeon Pea. Limited market, strong fixation and growth/biomass, great insectary, modest water, woody stems, special harvesting, some insect problems. Tall.
- Sunhemp (*Crotalaria juncea*). Limited market (fiber). Strong and semi-woody growth, big biomass, great insectary. Modest water, special harvesting, great host for *Macrophomina spp.*. Upright, tall.
- Other *Vigna* species (mung, urd, rice, etc.). Soy/Edamame. Special Markets.

### **Cover Crop Legumes:**

Winter: Several vetches and peas, Fabas, Clovers, Medics, mixtures, forage crops.

Summer: African cowpeas (Afrique, Red Ripper, Iron & Clay), vetches, clovers, crotalaria, sesbania, pigeon pea. Also LabLab and Velvet bean.

**Niche Cover Crop Mixtures** (SAFS example): Sorghum-sudan + African cowpea + Lablab, following early tomatoes. Also use of *Mucuna spp.* to help problem soils.

**General Issues: Inoculant specificity, Seed procurement/cost/maintenance.**

<http://anrcatalog.ucdavis.edu/search/cover%20crops.aspx?page=2>

1989 Cover Crops for California Agriculture; P. Miller et. al. Publication # 21471

1993 Creative Cover Cropping in Annual Farming Systems; (DVD) # 6546D

1998 Cover Cropping in Vineyards; C. Ingels et. al. # 3338

Resources: TS&L, Lockhart, Peaceful Valley FS, Fred Thomas (CERES)

# Wikipedia Classification

FAO recognizes 11 primary pulses.

1. Dry beans (*Phaseolus* spp. including several species now in *Vigna*)
  - [Kidney bean](#), [haricot bean](#), [pinto bean](#), [navy bean](#) (*Phaseolus vulgaris*)
  - [Lima bean](#), butter bean (*Phaseolus lunatus*)
  - [Azuki bean](#), adzuki bean (*Vigna angularis*)
  - [Mung bean](#), golden gram, green gram (*Vigna radiata*)
  - [Black gram](#), Urad (*Vigna mungo*)
  - [Scarlet runner bean](#) (*Phaseolus coccineus*)
  - [Ricebean](#) (*Vigna umbellata*)
  - [Moth bean](#) (*Vigna acontifolia*)
  - [Tepary bean](#) (*Phaseolus acutifolius*)
2. Dry [broad beans](#) (*Vicia faba*)
  - [Horse bean](#) (*Vicia faba equina*)
  - [Broad bean](#) (*Vicia faba*)
  - [Field bean](#) (*Vicia faba*)
3. Dry peas (*Pisum* spp.)
  - [Garden pea](#) (*Pisum sativum* var. *sativum*)
  - [Protein pea](#) (*Pisum sativum* var. *arvense*)
4. [Chickpea](#), Garbanzo, Bengal gram (*Cicer arietinum*)
5. Dry [cowpea](#), [Black-eyed pea](#), blackeye bean (*Vigna unguiculata*)
6. [Pigeon pea](#), Arhar /Toor, cajan pea, congo bean (*Cajanus cajan*)
7. [Lentil](#) (*Lens culinaris*)
8. [Bambara groundnut](#), earth pea (*Vigna subterranea*)
9. [Vetch](#), common vetch (*Vicia sativa*)
10. [Lupins](#) (*Lupinus* spp.)
11. Minor pulses include:
  - [Lablab](#), [hyacinth bean](#) (*Lablab purpureus*)
  - [Jack bean](#) (*Canavalia ensiformis*), [sword bean](#) (*Canavalia gladiata*)
  - [Winged bean](#) (*Psophocarpus teragonolobus*)
  - [Velvet bean](#), cowitch (*Mucuna pruriens* var. *utilis*)
  - [Yam bean](#) (*Pachyrrhizus erosus*)