4. Store grain in airtight containers such as metal drums, triple layers bags (e.g purdue improved crop storage bags). The airtight containers cut off oxygen for adult bruchids after which they suffocate and die.

5. Grains can be protected from bruchids by mixing grains with equal quantities of sieved sand or wood ash. This helps to expel the air between the seeds and also emerging bruchids are physically unable to push their way out of the seed and therefore will die without mating.

6. By admixing grains with *Tephrosia* leaf powder at a rate of 0.1% (w/w).

7. Mixing grains with insecticides e.g 1kg malathion dust/1000kg of threshed grains or Pirimiphos methyl (marketed as actellic dust) applied at 500g dust/1000 kg of threshed grain.

8. Fumigation using Aluminum phosphide tablets (2 tablets/100 kg of seeds) to kill larvae and adult weevils. The tablets should be wrapped in a piece of cloth or tissue paper before placing it inside the seed container. **Do not store seed treated with Aluminum phosphide in a living room or animal house due to its toxicity.** *Aluminum phosphide is marketed as Phostoxin, Cyclotoxin, Forcetoxin, Protex, Gastoxin or Quickphos.*



Authors: Mbeyagala, K. E. Amayo,R., Omadi, R., Okwang, D and Obuo, J. E. P. 2016

For more information contact,
Dryland Legume Research Programme, NaSARRI,
P.O. Box, 56 Soroti
Tel: +256 752 36 86 36
Email: kmbeyagala@gmail.com

National Semi Arid Resources Research Institute

A Brief Guide on Pigeonpea Production

National Agricultural Research Organization

Introduction:

Pigeonpea is a shrub-like legume whose grain is rich in minerals, vitamins, fat and protein. It contains more minerals, 10 times more fat, 5 times more vitamin A, and 3 times more vitamin C than ordinary peas. It is also abundant in protein (up to 28%), making it an ideal supplement to traditional cereal-banana-or tuber based diets that are generally protein deficient. Pigeonpea is also an important source of fodder for livestock (pod walls and leaves), fuel wood and improves fertility through nitrogen fixation (up to 40 $kgha^{-1}$ of nitrogen) and extracts more (2-7 times) iron bound phosphorus than other crops. The crop can also improve the structure of the soil. The long roots bore channel deep into the ground, increasing the infiltration of water for subsequent crops. They also bring nutrients from nutrients from the deep layer of the ground to the top ensuring that the plant produces grain even in drought years when most other crops fail completely.

Varieties:

Two commercial pigeonpea varieties have been released in Uganda, these are; SEPI1 and SEPI2. SEPI1 is a medium duration (maturity about 150 days) non determinate variety while SEPI2 is a short duration (Maturity about 120 days) determinate variety.



Soil requirements and seedbed preparation

For good yields, select a field with good soil fertility and proper drainage. Pigeonpea cannot withstand water logging, so low lying fields that are liable to water logging should be avoided. Timely field preparation with a basal dose of 100kg ha^{-1} of Di-ammonium phosphate (DAP) is advisable. The seedbed should be fine to ensure proper germination.

Planting and Spacing

Sowing should be done at the onset of rains as this will ensure good plant growth and canopy development. For a short duration variety such as SEPI2, use row-row spacing of 60cm with a plant to plant spacing of 30cm. For this spacing a seed rate of 20-22 $kgha^{-1}$ is required. For a medium duration variety such as SEPI1, a row to row spacing of 75 cm and plant to plant spacing of 25cm is recommended. This spacing requires a seed rate of 18-20 $kgha^{-1}$. The seeds should be placed about 5cm deep and covered firmly with soil to ensure a good contact between seed and soil particles and ultimately germination. In high rainfall areas or areas with heavy soils, plant pigeonpea on ridges for better drainage. After two to three weeks after germination, thinning to two plants per hill should be done.

Weed Control

Pigeonpea has a slow initial growth making it prone to weed competition particularly during the first six weeks of growth. Therefore early weed control is recommended. Generally three weedings, the first at 25-30 days, the second about 50-60 days and the third 80-90 days after sowing can control most weeds.

Disease Management

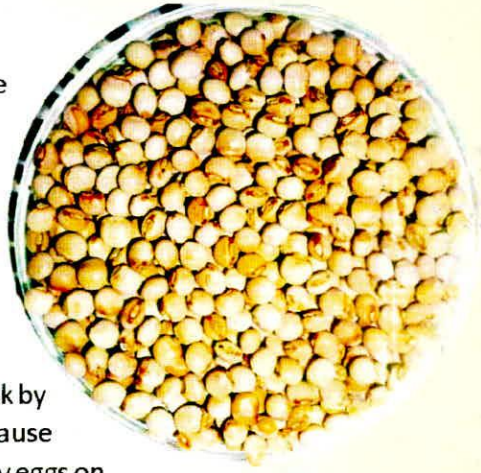
Fursarium wilt, cercospora leaf spot and powderly mildew are common diseases in some parts of pigeonpea growing areas. These are best controlled by using fields that are disease free and appropriate crop rotations, use of resistant variaties, spraying with a fungicides (mancozeb 80WP or cabendazim 50WP at 1g/Litre).

Field Pest Management

Serious pests of pigeonpea in Uganda are; pod borers (*Helicoverpa armigera* and *Maruca vitrata*), pod fly *(Melanagromyza obtusa*), pod suckers (*Clavigralla spp*) and blister beetle (*Mylabris pustuie).* These cause severe yield reduction and grain quality and at times total crop loss. These can be controlled by application of Cypermethrin 5 EC or a combination of Profenofos 40% +Cypermethrin 4% (100ml in 20L Knapsack sprayer) beginning at flower initiation/budding and subsequent sprays at 10-15 day intervals. Blister beetles can be controlled manually by hand picking and crushing them since they are large and slow moving.

Harvesting, Drying and Threshing

The crop can be harvested either by picking pods, cutting off the pod-bearing Branches, or by cutting the whole plant at ground level when about 75-80% pods are mature. The harvested materials should be left in the field for a few days to dry in the sun. Threshing can be done by heaping pods and beating them gently with sticks (care should be taken to avoid damaging the grains). Different varieties should be threshed on different days to avoid mixing up of varieties. After threshing, immature grains, chaff and other debris should be removed through winnowing. Winnowing is done against the air drift so that the inert materials, such as chaff and broken seeds, are blown away by the wind and the grains are collected in a clean container/bag.



Storage

Dry the seeds/grains thoroughly to a moisture content of <12% before storage. Store grains in clean sacks/bags free of weevils and placed in a dry, clean, well ventilated and rodent-proof store on raised benches/platforms.

Storage Pest Control

Stored pigeonpea grain is susceptible to attack by bruchids, *Callosobruchus spp* and these can cause up to 100% losses. Adult bruchids normally lay *eggs on* Pods in the field and infestation continues during drying, in barnyards and under storage conditions. After hatching, the larvae burrow through the seed coats and develop within seeds and eat up the cotyledon, thereby causing extensive damage. Adult emerge from the seeds through characteristic holes made by the larvae. Therefore to avoid damage, bruchids should be controlled through;

1. Stores should be cleaned regularly and the residual bruchid population should be destroyed.

2. If gunny bags are to be re-used for storage, they should be soaked in boiling water and dried to kill any remaining bruchids.

3. Regularly place the grain in hot sun for about 4 hours for 3-4 days per month to kill adults and larvae.