

## Integrating Pigeon pea (*Cajanus cajan*) in different parts of the farm - southern Region Ethiopia

### Introduction

Pigeon pea (*Cajanus cajan*) is a legume from the family Fabaceae that can be cropped on an annual or perennial basis (3 to 4 years). Pigeon pea is interesting at several levels:

- ✓ It produces peas over a relatively long period (2 to 3 months), when the availability of food in the farm is low. It is well appreciated in the diet and it contains high level of proteins.
- ✓ The leaves and soft branches are a valuable source of fodder for the livestock
- ✓ By fixing nitrogen, it helps improving the soil fertility. The biomass produced by defoliation also represents a significant organic contribution to feed the soils.
- ✓ Its cultivation is relatively simple and the plant grows well in poor soils. For a production over 2 or 3 years, it is however necessary to prune it every year.
- ✓ Larger branches can also be used as firewood

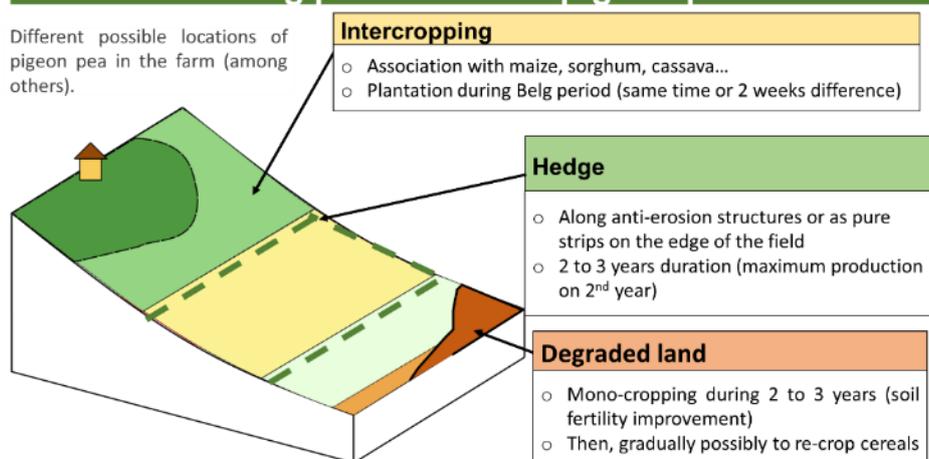
The pigeon pea is mainly intended for areas of mid-altitudes (midlands). Depending on the soil, it grows between 1500 to 2000m. There are many varieties of pigeon pea, with different characteristics that may be more suitable depending on the intended effect: some varieties are more interesting for a higher production of peas, whereas other are producing more biomass.

Pigeon peas can be integrated in several places in the farm and thus meet several needs:

- ✓ On anti-erosion structures, allowing to enhance the productivity of those spaces to control erosion. It also contributes to maintain the soil, especially while the fodder grasses are fully developed
- ✓ In association with certain crops such as maize, sorghum, cassava... It contributes to produce more quantity of food for a similar surface
- ✓ On degraded land and poor soils where it helps restoring the soil fertility

### Some interesting practices with pigeon pea

Different possible locations of pigeon pea in the farm (among others).



The sections below present technical recommendations on these different practices, based on experiences developed with farming families. It includes data on production and profit that have been measured with farming families on the field. This data can serve as a reference considering that the figures may vary depending on the climate, the type of soil, the altitude, the varieties...

### Proposed approach for a training

For field technicians, it is advised to:

- Present those different practices, as developed in the next parts bellows
- If already existing in the areas, start from the farmers practices.
- Make practical demonstration with the farmers (spacing of the seeds for hedge establishment, for monocropping in degraded lands or for association, help farmers identifying possible locations in farms,...)
- Encourage farmers to distribute small amount of pigeon pea seeds to allow its introduction for farmers who have not cropped it yet, and to share their experience



# 1. Hedge of pigeon pea on anti-erosion structures or on the edge of the fields

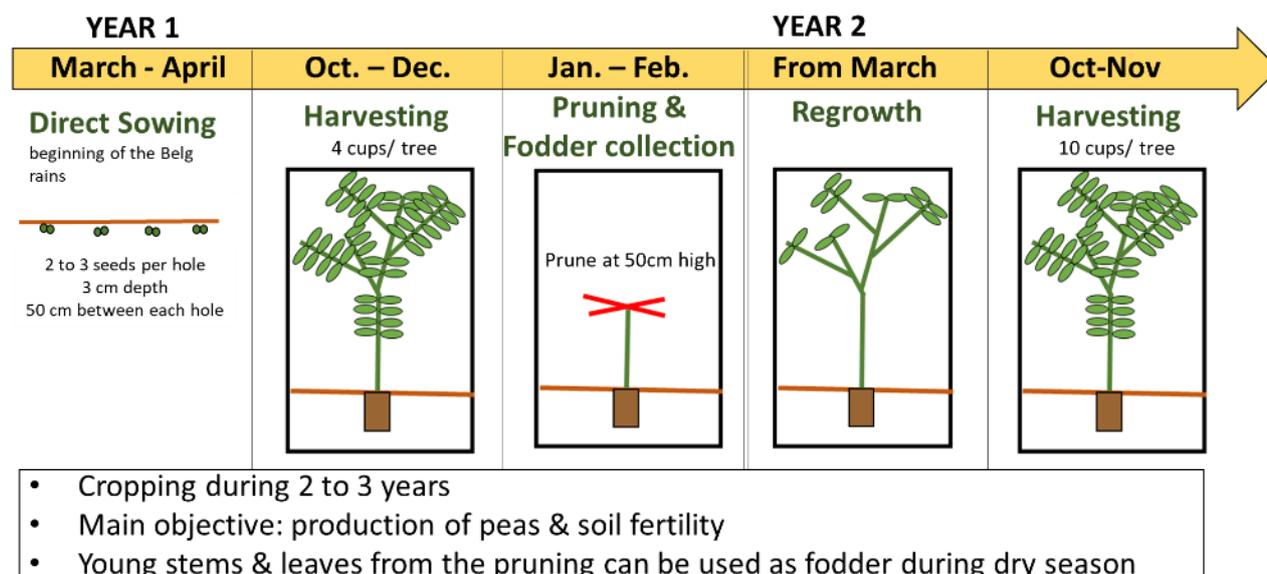
## Description of the practice:

Pigeon can be cropped in pure hedges for 2 or 3 consecutive year. The pigeon is directly sown in rows: 50cm interval between 2 holes, 2 to 3 seeds per hole at 2 to 2 cm deep. The establishment of hedges of pigeon pea is particularly interesting:

- Along anti-erosion structures
- As pure hedges along the border of fields or on the edges of the farm.

## Calendar: planting, harvest, pruning

The pigeon pea is sown in March (at the beginning of the rains) and the peas are harvested from October to December. After harvesting (usually in January), the tree has to be pruned at 50 to 80cm high. From the pruning time to the next belg season (March), the leaves and young branches can be supplied to feed the animals (excellent fodder source).



## Production and economic value:

During the first year, the production is medium (around 4 cups per tree, corresponding to a production of about 840 grams). The pigeon pea reaches its peak of production on the 2<sup>nd</sup> year (10 cups per tree, equivalent to 2,1kg). The harvesting period (October-December) corresponds to a period of high treasury needs and food shortage.

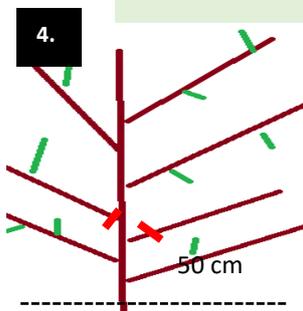
Indicative production data for one hedge of 20 meters length (1 row of pigeon pea, planted at 50cm distance between the plants):

- 1<sup>st</sup> year: the production ranges from 150 to 200 cup of peas, equivalent to 31,5 to 42 kg. It corresponds to an economic value of 1,000 ETB (using market price of Feb 2021).
- 2<sup>nd</sup> year: the hedge produces around 400 cups of peas, equivalent to 84kg. It corresponds to 2,600 ETB.

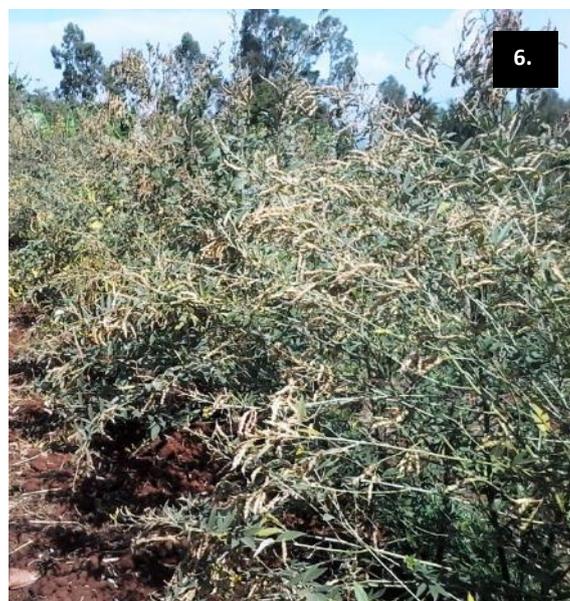
This production represents therefore a substantial source of consumption or incomes for the farmers. The production usually starts to decline on the 3<sup>rd</sup> years, being then equivalent to the 1<sup>st</sup> year of production. It is therefore advised to renew the hedge in another place and to wait for 2 years before re-establishing it at the same location to limit the risks of diseases.

Production data:	Year 1	Year 2
hedge of 20 meters – 2 trees per meter – 40 trees in total		
Average production per tree	Cup: 4 Kg:0,84	Cup: 10 Kg:2,1
Total production on the hedge	Cup: 160 Kg: 33,6	Cup: 400 Kg: 84
Economic value per tree (ETB) Price for 1 cup in Feb. 2021 = 6,5 ETB	26 ETB	65 ETB
Economic value for the total hedge (ETB)	1 040 ETB	2 600 ETB

## Illustrations



- **1 and 2:** hedge of pigeon pea on anti-erosion structures, here is association with fodder grass
- **3 and 4:** to maintain a production for 2 to 3 years, it is necessary to prune the pigeon pea after harvest, at about 50 cm high. Pigeon pea is then regrowing. Young stems and leaves can be used as fodder and bigger branches as firewood
- **5:** a plot surrounded by a hedge of pigeon pea, showing the possibility to optimise the edge of the fields
- **6:** pigeon pea ready for harvesting



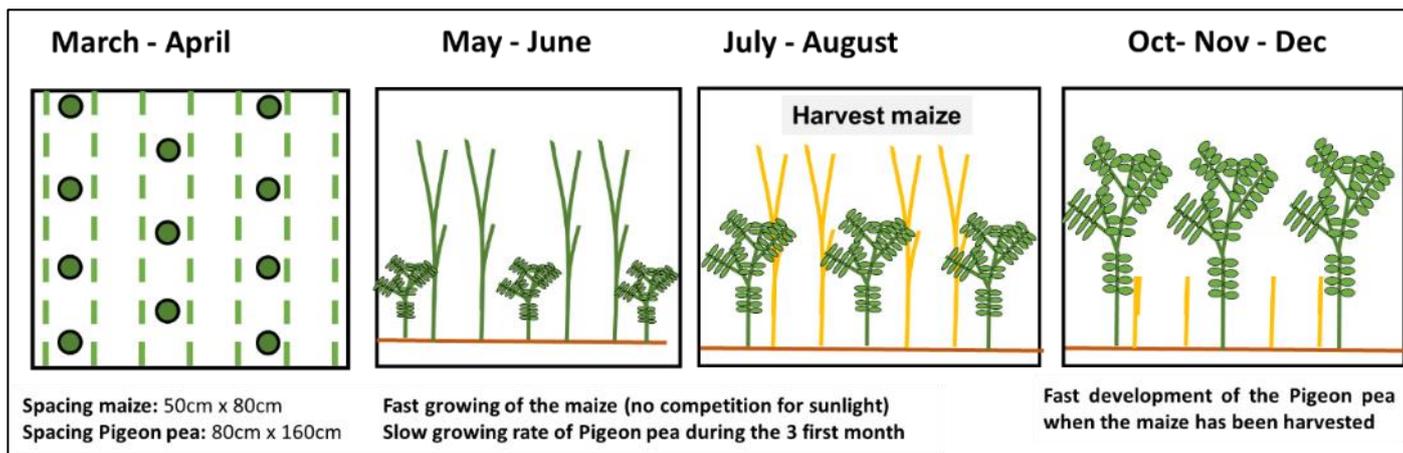
## 2. Associating pigeon pea with other crops

### The example of pigeon pea with maize

Intercropping of Pigeon Pea with maize is an interesting practice to increase the global production per surface unit: the pigeon pea has no major influence on the yield of maize and doesn't compete for the sunlight during the maize growing. While the maize is dried (ready for harvesting), the pigeon pea is growing fast and overpass the maize. This association is highly productive:

- The maize production (yield) is the relatively similar as when the maize is cropped alone
- The pigeon pea is harvested from October to December, allowing a complementary source of food or income from the same surface (high increase of the land productivity).

**Cropping practice:** the pigeon pea is planted at the same time between the rows of maize (80 cm interval between the seeds on the row, and 60cm interval between 2 rows of pigeon pea).



### Illustration



Top left: Maize and pigeon pea (still at early stage) association in May - June

Top right: in August, the maize is dried and ready for harvest while the pigeon pea starts to enter into production

Below: pigeon pea can be associated with different crops such as sorgho, cassava, around coffee... On the picture, a farmer who decided to plant pigeon pea around a small plot dedicated for taro



### **3. Planting pigeon Pea on degraded land**

The pigeon pea can also be planted in unproductive lands and is growing quite well in poor soil. Pigeon pea is a legume and has the capacity to fix nitrogen, contributing to increase the fertility of the soil. For degraded land, pigeon pea is cropped alone for 2 to 3 consecutive year. After, it helps to progressively restore the production of species like sorghum, maize, haricot, teff...

**Cropping practice:** the pigeon is sown in row (50cm between the seeds in the same row and 80cm between the rows lines). Such dense plantation usually has a rapid and significant effect on the soil fertility. The high leaves defoliation also helps to increase the organic matter contents in the soil.



Top: Degraded land planted with Pigeon pea during dry season (high leaves' defoliation).

Below left: a young plantation of pigeon pea in a degraded and rocky plot

Below right: Landscape of degraded land planted with pigeon pea during (here during the rainy season).

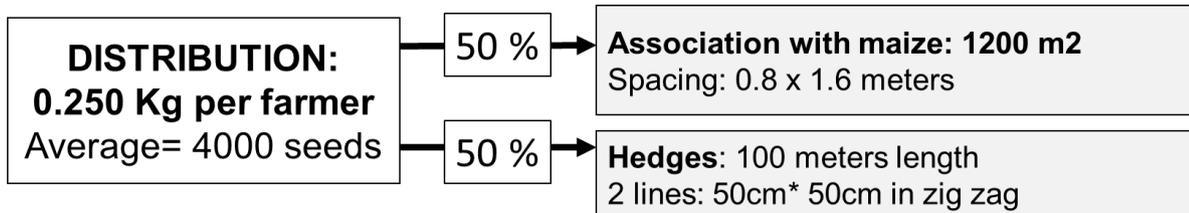


#### **4. Supporting the introduction and spreading of pigeon pea in a non-covered area**

The following approach has been quite successful in midlands areas of the southern Ethiopia, to introduce and promote the cropping of pigeon pea. To this end, each farmer (beneficiaries) is receiving 0.250 kg of seeds on the first year of intervention. Then, it is suggested to the farmers to store part of their harvest in order to gradually increase their production on the following years.

From this initial quantity of 0.250 kg, each farmer can for instance divide it 2 parts:

- 0.125 kg for the association with maize, which allows to crop 1 200 m<sup>2</sup> (half a timad)
- 0.125 kg allow to establish 100m of hedges in the farm.



#### **Indicative references:**

- 1kg = 16 000 seeds
- 1000 seeds = 62,5gr
- Pigeon pea produces during 3 to 5 years, with a production that usually starts to decline after 3 years. When becoming unproductive, it can easily be uprooted.
- Note that doesn't grow well in the shadow

Pictures below: examples of productive hedges

