

## Why is suited to growing in mixture with maize?

The slow growth of pigeonpea in the early stages offers very little competition to the companion maize crop. Thus maize yields are the same as in sole crops. After maize harvest the pigeonpeas grow at a faster rate well into the dry season using residual soil moisture. As the rooting characteristics of pigeonpea and maize are different there is very little underground competition during maize growth and the deep rooting system of pigeonpea allows it to use moisture left deep in the soil when maize is harvested. Growing pigeonpea is then a 'bonus crop' which costs the farmer little extra in labour.

## Management practices

Pigeonpeas are well adapted to soils of poor quality and respond little to fertilizers. This means that the fertilizer used should be that required by the main crop. No special cultural practices are required, just care in weeding. Management practices for the main crop are adequate for pigeonpea grown as an intercrop; however, if pigeonpeas are to be ratooned they should be cut back after the onset of the first rains to reduce pigeonpea mortality. The best ratooning height is 30-45 cm above ground as the resulting pigeonpea growth is not strong enough to depress the yield of maize, yet the yield of pigeonpeas is increased over that of pigeonpea planted by seed. In this case there is no need to make new ridges - old ridges can just be rebuilt.

If you want further information on growing pigeonpea in Malawi, or on seed suppliers, please contact:

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A publication of the Soil Fertility Network for Maize-based Cropping Systems in Countries of Southern Africa (Soil Fert Net).

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## Pigeonpea

### Ideal for Intercropping with Maize in Malawi



Pigeonpea is the most versatile grain legume used by farmers in Malawi. It is grown mainly by small-holder farmers for its dry seed for both local consumption and export, generally intercropped with the staple food crop, maize. Pigeonpea has multiple uses for grain, fuelwood, livestock feed, to mark field boundaries and to improve soil fertility. The protein content of pigeonpea ranges from 21% to over 25% and it is used as a relish ration for workers on estates in Malawi.

## Pigeonpea helps to improve soil fertility too!

Apart from the many direct uses of pigeonpea it is a good crop to improve soil fertility. Pigeonpea forms nodules on its roots which contain special bacteria which are naturally present in the soil. These bacteria capture nitrogen from the air and turn it into a form which the pigeonpea plants can use for growth. This process is called 'nitrogen fixation' and is a form of free N fertilizer for pigeonpea which means that it can grow prolifically on poor soils.

Pigeonpea produces a lot of leaves throughout the year and keeps on losing leaves.



A dense carpet of fallen pigeonpea leaves forms under the crop and adds nitrogen to the soil.

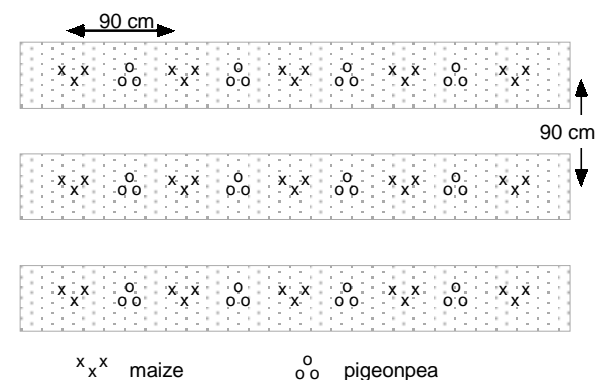
This results in continuous release of nutrients in the soil. The quality of fallen pigeonpea leaves (2% N) is much better than those of most other crops, so they can act as a useful organic manure in helping to maintain soil fertility. The deep rooting of pigeonpea also enables it to cycle back leached nutrients from deep in the soil to the surface layers. These deep roots can also act as a 'biological plough' to break up hard layers or plough-pans in soil.

## Intercropping pigeonpea in Malawi

Both pigeonpea and maize grow well in Malawi at a wide range of elevations from sea level to 2000 m above sea level meaning that both crops can be grown almost throughout the entire country. But pigeonpea production is concentrated in the south where human population densities are higher. Some pigeonpea is also grown in the central and northern regions but it is not a major crop. Most pigeonpea is grown in mixture with maize but some farmers also grow it near homesteads, on field boundaries and in hedges. One pigeonpea variety (ICP9145) is particularly well adapted and fits farmers' needs. The traditional pigeonpea landraces grown by farmers tend to be low yielding and are prone to a soil borne disease, *Fusarium* wilt, which can kill the plants.

## The best way of planting maize and pigeonpea mixtures

Long duration pigeonpea (>250 days) can be planted either in pure or in mixed stand with maize. No yield differences are found between pure and mixed crop pigeonpea so total benefits are greater when it is intercropped. If farmers decide to intercrop pigeonpeas with maize then the best planting pattern for optimum yield for both maize and pigeonpea is planting pigeonpea on the ridge between maize stations. This is shown in the diagram below:



Maize should be planted 90 cm apart on the ridge and pigeonpea planted between maize stations 45 cm from each maize station. For both crops there should be 3 plants/station. Because of their perennial habit pigeonpeas can be planted every year using direct seeding as described above or ratooned at the onset of rains after the first year. If pigeonpeas are planted once every two years then they should be 'ratooned' by cutting the stems 30-45 cm above the ground at the onset of rains in the second year.