

Soyabean: A versatile grain legume for smallholder farmers in Malawi



Photo: Jonathan Odhong' / IITA

The versatility of soyabean

Soyabean is a grain legume that can help to improve family nutrition and soil fertility. It is highly nutritious and ideal for combating malnutrition in children. It is also a special crop that produces 'nodules' on the roots, that act like small factories that make urea fertilizer for the crop. We therefore do not need to apply urea on soyabean in our fields, as we must always do for maize. For some types of soyabean we however, need to apply inoculants (Rhizobia) so that these small factories can be made on the roots. Varieties such as Magoye and Tikolole will not require any inoculation whereas many of the high yielding soyabean varieties (Makwacha, Nasoko, Solitaire) will require inoculation for nodule formation to occur successfully. A well nodulated soyabean crop is ideal to grow in rotation with maize as maize grows better after soyabean.

- the normal ridge. Two rows per ridge (instead of only one) ensure high plant population > 250,000 plants per hectare. This results in good yields.
4. Within a row, drop (sprinkle) the soyabean seeds at about 8 cm apart. These seeds must be planted no more than 3 cm deep, otherwise germination will not be good.
5. About 90 kg of seed is required to plant one hectare (about 9 kg per plot of 30 m x 40 m). For varieties with small seeds, less quantity of seed will be required.
6. Weeding should be done at least 2 times to keep fields weed-free, especially in the first month. With high plant populations, soyabeans have ability to shade out other plants, so high soyabean population is helpful to control weeds.

Growing soyabean in 6 steps

1. Soyabeans need moist soil for germination. They must not be dry planted and should not be planted until it is clear that the rainy season has properly started (plant after a few days of rainfall!).
2. Make ridges that are 75 cm apart, just as for maize, so that the normal ridging system is not disrupted by the production of soyabeans. Avoid ridges wider than 75 cm as this is wasting precious land
3. Plant soyabean on 2 shallow furrows (3 cm deep at most) that can be made with a stick on each side of



'Urea factories' on the roots of a soyabean plant. Certain soyabean varieties require inoculation for these 'urea factories' to form successfully

Fertilizer application

- When soyabean is grown in rotation with a crop that had received NPK fertilizer the previous season, the crop can be grown successfully without any direct fertilization
- On poor soils apply a 50 kg bag of NPK (23:21:0) fertilizer per hectare at planting. This will supply nutrients (especially phosphorus) for the small factories on the roots to work better.
- There is no need to apply urea on soyabeans. This is a miracle crop. Save urea for maize that desperately needs the urea!

- Pour the mixture over the seed and mix by hand in the shade (always do this away from direct sunlight to avoid killing the rhizobia)

Soyabean harvesting and residue management

Soyabean should be harvested when the pods are mature and yellow-brown. Most of the soyabean leaves will have fallen to the ground at this time, enriching soil fertility. A few seeds may be seen on the ground where the ripe pods have shattered. This is a clear sign to start harvesting!

- The crop should be cut at the ground surface or uproot early in the morning when they are still damp with dew
- Immediately transport the harvested soyabeans when still damp - if soyabean is harvested and carried in the midday sun, many pods will shatter and the seeds will be lost
- After a few days of further drying, the plants can be threshed with a stick and winnowed
- The residues can make a good mulch or animal feed or be composted for application to the fields in the following season -never burn residues; you will be burning a good source of enriching your soil.

How to use Rhizobium inoculant

Some soyabean types such as Magoye and Tikolole are special as they do not need inoculation with Rhizobium. However, these varieties are in short supply and most of the varieties available will need inoculant.

Here are the steps to inoculate soyabean:

- For Chitedze produced rhizobia, 50 g packet is adequate for 10-15 kg soybean seed
- Open the packet of rhizobium inoculant and mix with 200 ml of water-plus a match box full of sugar for 15 kg of seed. Sugar helps the inoculant to stick to seed



Soyabean seed



Soyabean at reproductive stage



Soyabean at maturity stage



The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.

Contact: Regis Chikowo (chikowor@msu.edu), Sieg Snapp (snapp@msu.edu) and Irmgard Hoeschle-Zeledon (i.hoeschle-zeledon@cgiar.org)

www.africa-rising.net

