# Growing green manure/cover crops

## A guide for small-scale farmers

### What are green manures/cover crops?

Green manures or cover crops are plants that are grown to provide ground cover and improve soil fertility.

### What are the benefits of growing green manures/ cover crops?

Green manures or cover crops can provide numerous benefits to a farmer:

- Protection of soil against erosion, direct sunlight, and rain drop impact.
- Reduce weed infestation.
- Improved soil fertility through organic matter addition and nitrogen fixation.
- Reduce crop pest and disease infestation.
- Fodder for livestock.
- Source of income through sales of seed.
- Some deep-rooted green manure/cover crops bring nutrients from deeper regions of the soil close to the surface for shallow rooted crops to access.

### Characteristics of good green manure/cover crops

Although most green manures are legumes (fix nitrogen), not all legumes are, however, good green manures or cover crops.

Below are some criteria to look out for when selecting a crop for use as a green manure/cover crop:

- A green manure must suit the local climate, and the soil that it is to be sown in.
- A green manure/cover crop must be a fast growing and leafy plant with lots of biomass.
- Green manures should not be closely related to the previous or following crop or the crop they are inter-cropped with as they could lead to competition and attract pests and diseases.
- Seed should be easily available and affordable.
- The crop to be used as a green manure should preferably have a high rate of nitrogen fixation.
- The green manure/cover crop should have a high water use efficiency especially when used in drier regions.

*Promotion of agroforestry supported by:*

unique land use

COMACO

Prepared by: Daniel M. Kalala

With support from

Federal Ministry of Food and Agriculture

by decision of the German Bundestag

# Guidelines for growing green manures/cover crops

1

**Mode of integration in the farming system** - is the green manure/cover crop to be grown as a sole crop or as an inter-crop? The mode of integration will determine the seed rate, the time of planting and the spacing.

2

| | Seed rate (kg/ha) | Spacing (inter-row × intra-row) (cm) | | When to plant | | Period to maturity (months) |
|---|---|---|---|---|---|---|
| | | Sole crop | Intercrop | Sole crop | Intercrop | |
| Velvet beans | 30 to 50 | 50 by 20 to 30 | Depend on main crop | Plant with first consistent rains | Plant when main crop is at knee-high | 4 to 5 |
| Black sunnhemp | 25 to 50 | Broadcast | Drilling in shallow furrows spaced at 20 to 30 | Plant with first consistent rains | Plant when main crop is at knee-high | 3 to 4 |
| Jack beans | 40 to 50 | 75 by 30 | Inter-row same as main crop, 30 cm intra-row. | Plant with first consistent rains | Plant with first consistent rains. Can be planted at the same time as main crop. | 5 to 6 |
| Red sunnhemp | 20 to 25 | Broadcast | Drilling in shallow furrows spaced at 20 to 30 | Plant with first consistent rains | Plant at first weeding (2 - 3 weeks) after germination of the main crop | 5 to 6 |
| Cowpeas | 40 to 60 | 5 by 50-75 | Inter-row spacing is dependent on main crop, 5 to 10 cm intra-row spacing. | late December or early Janu-ary | Plant when main crop is at knee-high | 3 to 4 |

**Seed rate and spacing** - different green manures have different seed rate. The Table above gives the seed rate, spacing, time of planting and period to maturity for some common green manures

3

**Weeding** - most green manures are very effective in suppressing weeds. However, before full establishment and covering the ground, there may be need for at least one weeding. To reduce on the need for weeding, ensure that a close spacing is used. Also plant on clean, weed-free fields.

4

**Slashing of green manures/cover crops** - green manures grown prior to the main crop can be slashed at flowering or when substantial amount of biomass has been produced. For green manures planted as a sole crop, it is preferable that slashing is done after harvesting the green manure seed. The green manure biomass does not have to be ploughed under but left on the surface to provide cover.

5

**Green manure for fodder** - whilst green manures are mainly grown to improve soil fertility, most of them are also good livestock fodder. A balance between soil fertility improvement and feeding livestock is needed. If some green manure biomass is to be fed to livestock, care should be taken so that the animal manure is returned to the field.

6

**Green manures/cover crops and land preparation** - the growing of green manure is an easier way to achieve minimum soil disturbance as the green manure provides the much-needed mulch to smother weeds. Once the green manure has been slashed and left to cover the ground, different types of minimum tillage can be practiced (a) zero tillage (dibble planting); (b) conservation basins; and (c) riplines.

7

**Protection of green manures/cover crops against fire** - there is need to create a buffer zone (area free of any vegetation) around the green manure cover crop field to protect against fire.