

Cereal Rotations

Rotation means growing a different crop every year!

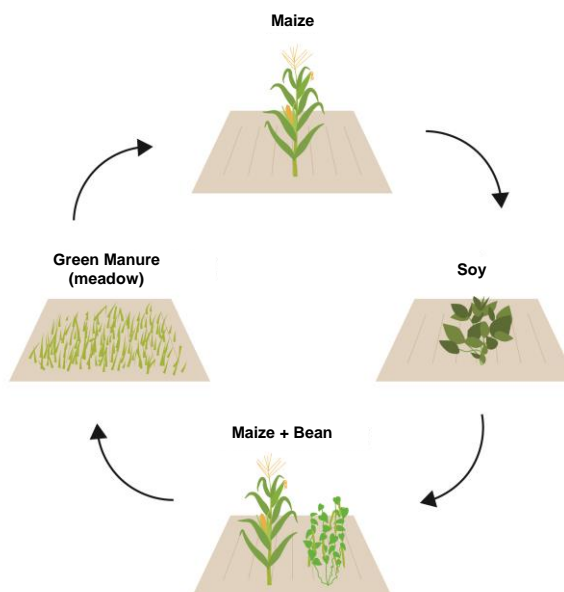
Why?

- Limit pests, diseases and weeds! They are not able to infect the following crop, because it's not a host plant. The eggs won't survive until the host returns to the plot.
- Maintain soil fertility! Different crops have different requirements.

How?

- Alternate crop families (respect the periods listed below)
- Alternate greedy, non-greedy, destructive and regenerative crops to avoid exhausting the soil.
- Alternate crops with different soil resource requirements
- Start with the most demanding and sensitive crops.
- Alternate according to morphology (leaf, root, fruit, upright or creeping crops).
- Always cover the soil.
- Cultivate a green manure crop every 4 years

Crop	Pause [x/y]
Cereals	1/2
Rice	2/3
Maize	1/2
Sorghum	3/4
Pennisetum	1/2
Fonio/small millet	3/4
Brachiaria	1/2
Legumes	1/2



x = Number of years of pause in a rotation of y years.

Example of a 4-year rotation

Cereal Associations

Legumes and cereals are **COMPLEMENTARY** in

- Space: upright cereals vs. bushy or climbing legumes
- Root systems: deep and powerful cereals vs. superficial legumes
- Nitrogen use: high demand for N by cereals forces legumes to promote biological fixation
- Phosphorus use: legumes' ability to mobilize P

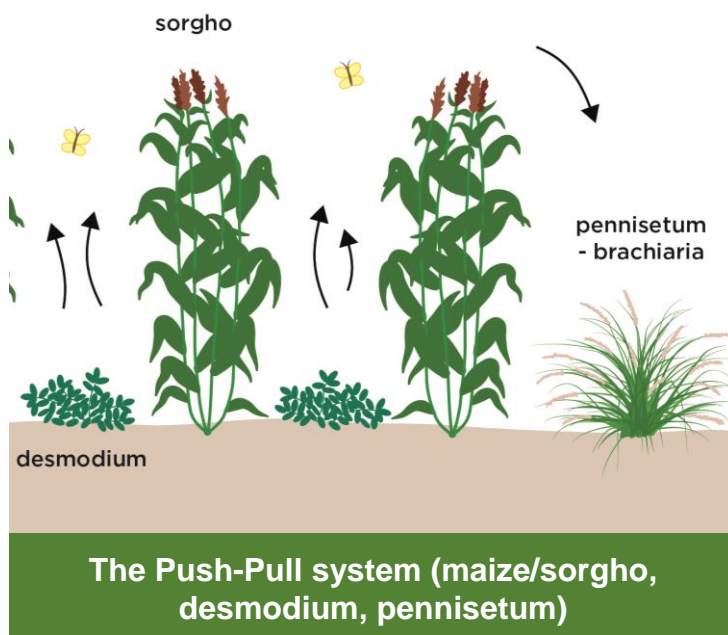
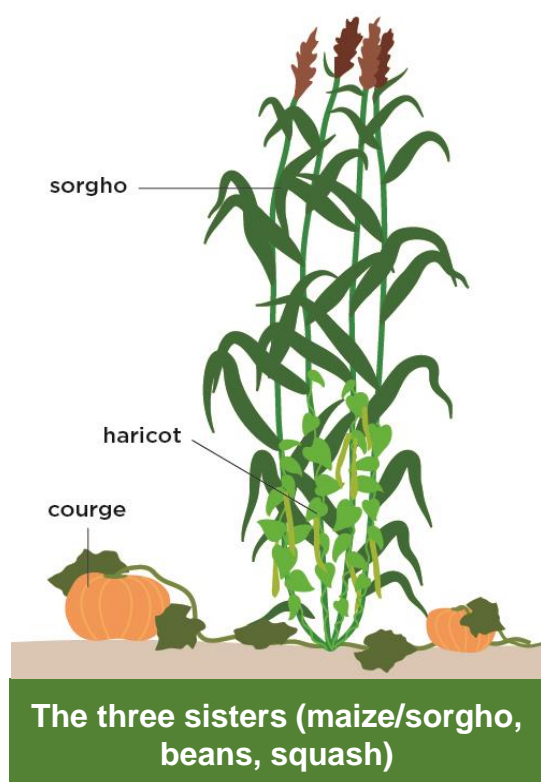
Possible associations

Cereal	Density [cm x cm]	Legume	Density [cm x cm]
Maize	100 x 40	Soy	100 x 5
	80 x 40	Peanut	80 x 30
	100 x 40	Cowpea	100 x 25
	100 x 40	Green bean	100 x 20
Sorgo	80 x 20	Peanut	80 x 30
	100 x 20	Cowpea	100 x 25
	100 x 20	Green bean	100 x 20

A Push-Pull system protects corn and other cereals against pests such as armyworms and stem borers.

Push: desmodium repels the pest

Pull: pennisetum/brachiaria attracts and traps pests



Peanuts

General

Morphology: Bushy

Root system: Shallow

Product: Fruit

Planting

Season: Wet Season

Seed depth: 2-3 cm

Sowing Seedhole (1 seed), 40 to 80 kg / ha

Soil preparation None

Spacing: 20 cm x 20 cm

Cultivation time

Non-productive: 6-8 weeks

Productive: 2 weeks

Maintenance

Weeding: 3,5,7 WAP

Plant protection information

Family: Fabaceae

Rotation break: 3/4

Risk: None



Fertilization and soil protection

Requirements: P ++

Danger: None

Ruminant M. (planting): 3-5 t/ha

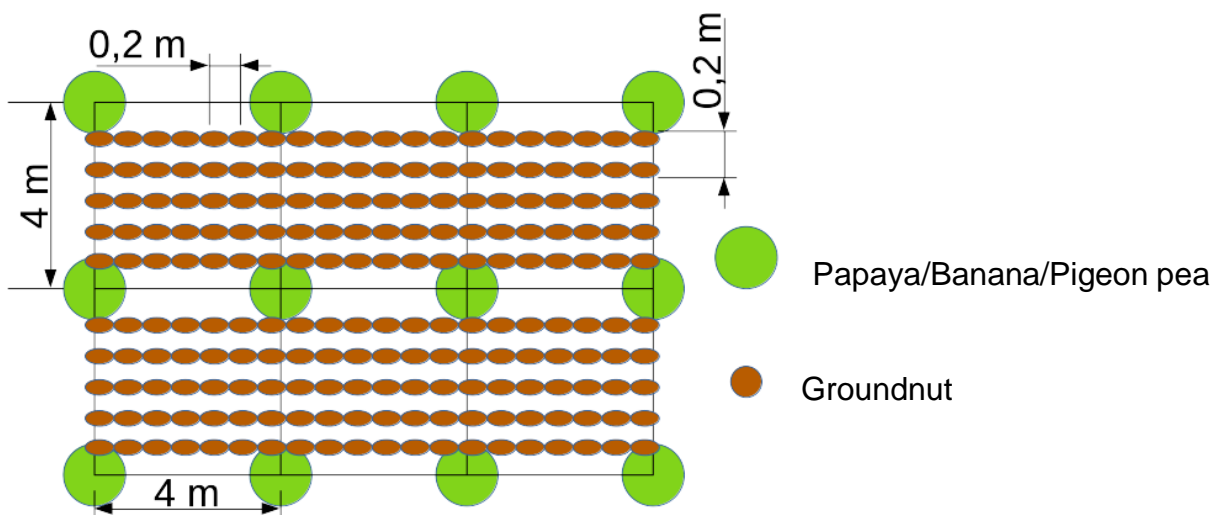
Chicken M. (6 weeks): 3-4 t/ha

Associations

Maize, Sorgo, Fonio: 75-100 cm strips or 40 cm rows

Semi-agroforestry: Bananas, papaya, and pigeon pea at 4m x 4m or 6m x 6m

Fonio: Alternate 1 m strips of fonio with 1 m strips of groundnuts



Bissap

General

Morphology: Bushy

Root system: Shallow

Product: Flower

Planting

Season: Wet Season

Seed depth: 2-3 cm

Sowing: Seedhole (2 seeds, start at 1 plant), 5 kg/ha

Soil preparation: Loosen soil with subsoiler

Spacing: 80 cm x 40 cm

Cultivation time

16 weeks

Maintenance

Weeding: 3,5,9,13 WAP



Plant protection information

Family: Malvaceae

Rotation break: Not necessary

Risk: Insects ++

Fertilization and soil protection

Requirements: NP ++

Danger: Not established

Ruminant M. (planting): 5-5 t/ha

Chicken M. (10 weeks): 1-2 t/ha

Fonio



Fonio intercropped with groundnut (strip)

General**Morphology:** Erect**Root system:** Deep**Product:** Grain**Planting****Season:** Wet Season**Sowing:** Broad cast, approx. 20 kg/
ha**Soil preparation:** Loosen soil with
subsoiler**Cultivation time**

12-14 weeks

Maintenance**Weeding:** Not necessary**Plant protection information****Family:** Poaceae (Grasses)**Rotation break:** 1/2**Risk:** None**Fertilization and soil protection****Requirements:** Week**Danger:** None**Ruminant M. (planting) :** 5-6 t/ha**Associations****Peanuts:** Alternate 1m strips of fonio
with 1m strips of peanuts.

Green beans

General

Morphology : Climbing

Root system: Shallow

Product: Fruit, Grain

Planting

Season: Wet Season

Seed depth: 1-2 cm

Sowing : Seedhole, 5 to 10 kg/ha

Soil preparation: Not necessary

Spacing: 50 cm x 20 cm

Cultivation time

Non-productive: 4-5 weeks

Productive: 3-4 weeks

Maintenance

Weeding: 3,5,7 WAP

Staking: Depending on variety



Plant protection information

Family: Fabaceae

Pause rotation : 3/4

Risk: None

Fertilization and soil protection

Requirements : P +

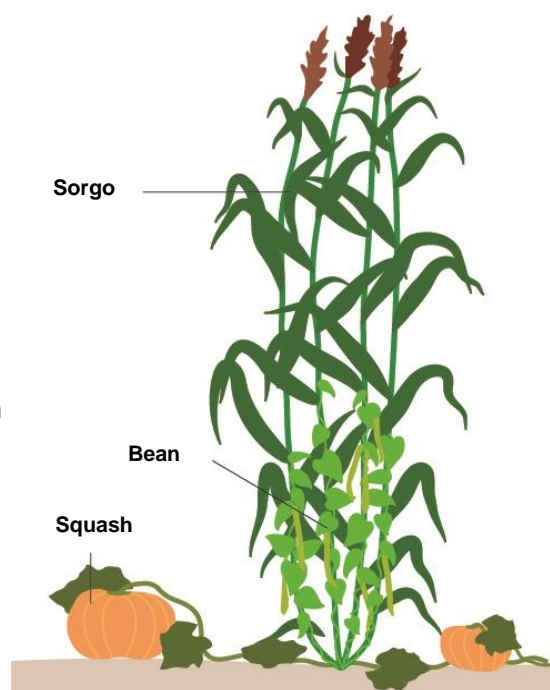
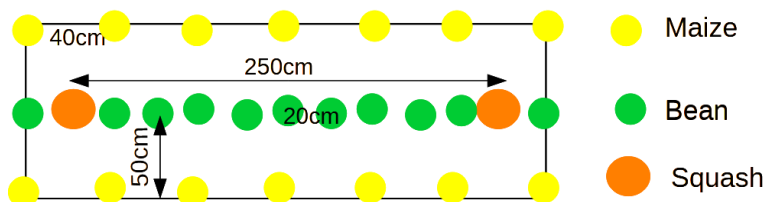
Danger: None

Fertilisation: None

Associations

Maize: 40cm rows

Squash: Between the rows



Maize

General

Morphology : Erect

Root system: Deep

Product: Grain

Planting

Season: Wet Season

Seed depth: 3-4 cm

Sowing: Seedhole (2 seeds, start at 1 plant), 20 to 30 kg/ha

Soil preparation: None

Spacing: 40 cm x 40 cm

Cultivation time

Non-productive: 9-13 weeks

Productive: 1 week

Maintenance

Weeding: 3,5,7 WAP



Plant protection information

Famille: Poaceae

Pause rotation : 1/2

Risk: Insects ++

Fertilization and soil protection

Requirements: NP +++

Danger: Depletion+++

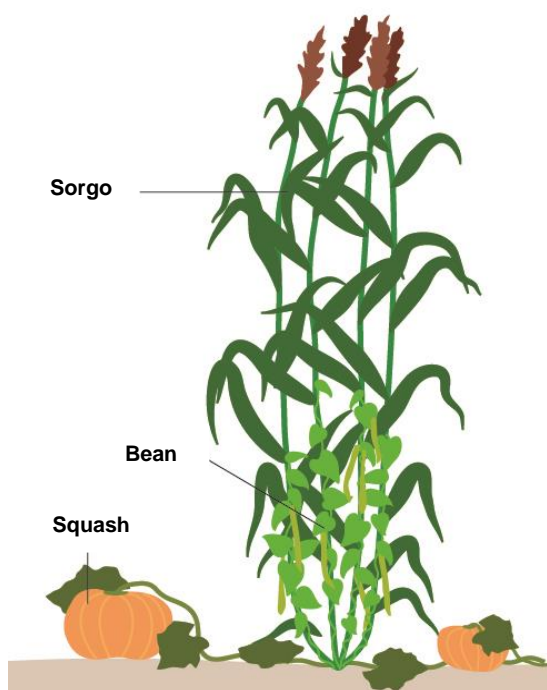
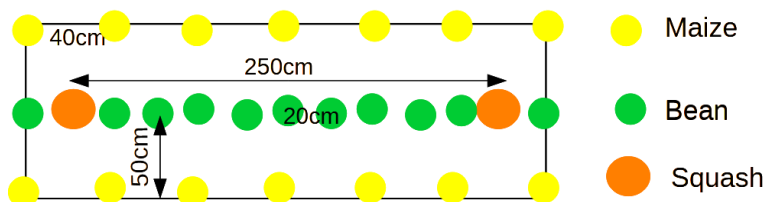
Ruminant M. (planting): 7-8 t/ha

Chicken M. (earring): 2-3 t/ha

Associations

Bean/arachid/soybean/ cowpea or desmodium: 40 cm rows

Squash: up to 0.8 m x 2.5 m



Rice

General

Morphology: Erect

Root system: Deep

Product: Grain

Planting

Season: Wet Season, off-season

Seed depth: 2-4cm

Sowing: Seedhole (4 seeds, start at 1 plant), 20 kg/ha

Soil preparation: Soil loosening with subsoiler

Spacing : 20 cm x 20 cm

Cultivation time

12 weeks

Maintenance

Weeding: 3,5,9 WAP



Plant protection information

Family: Poaceae (grasses)

Rotation break: 2/3

Risk: Disease ++, Insects +

Fertilization and soil protection

Requirements: NP +++

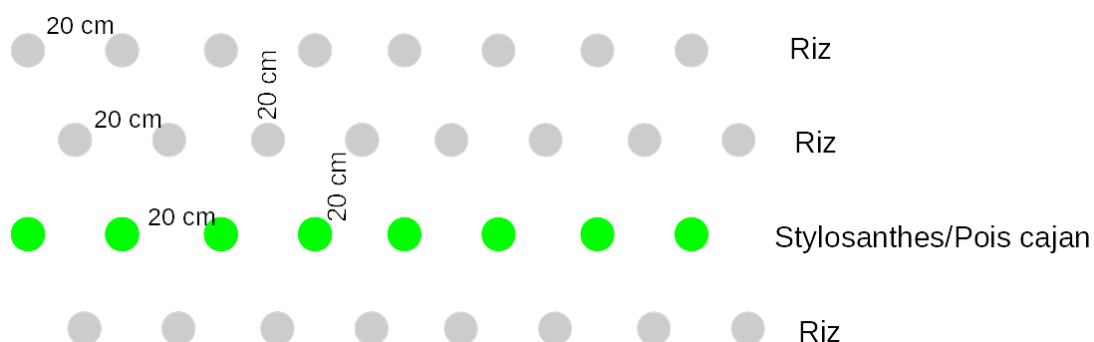
Danger: Depletion+++

Ruminant M. (planting): 5-6 t/ha

Chicken M. (earring): 1-2 t/ha

Associations

Stylosanthes/Cajan Pea: 2 lines of rice + 1 line of stylosanthes/Cajan Pea, 20cm x 20cm



Cowpea

General

Morphology: Creeping/Climbing

Root system: Shallow

Product: Grain

Planting

Season: Wet Season

Seed depth: 2-3cm

Sowing: Seedhole (1 seed),

20 to 25 kg/ha

Soil preparation: Soil loosening with subsoiler

Spacing: 50 cm x 15 cm

Cultivation time

8-10 weeks

Maintenance

Weeding: 3,5 WAP



Plant protection information

Family: Fabaceae

Rotation break: 3/4

Risk: Insects +

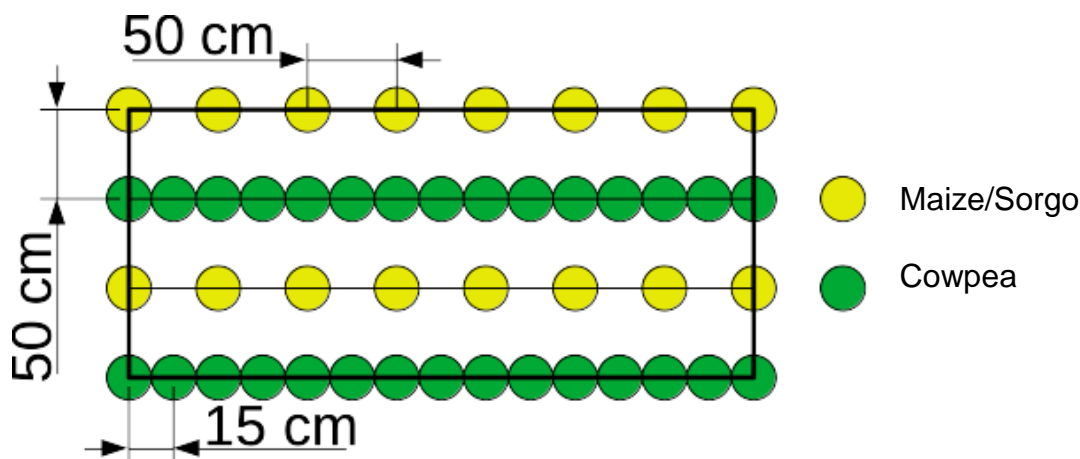
Fertilization and soil protection

Requirements: P ++

Fertilisation: None

Associations

Maize, sorghum : 50 cm rows



Soja

General

Morphology: Bushy

Root system: Shallow

Product: Grain

Planting

Season: Wet Season

Seed depth: 2-4cm

Sowing: Seedhole (1 seed),
100 kg/ha

Soil preparation: Soil loosening
with subsoiler

Spacing: 15 cm x 15 cm

Cultivation time

8-10 weeks

Maintenance

Weeding: 3,5,9 WAP



Plant protection information

Family: Fabaceae

Rotation break: 3/4

Risk: None

Fertilization and soil protection

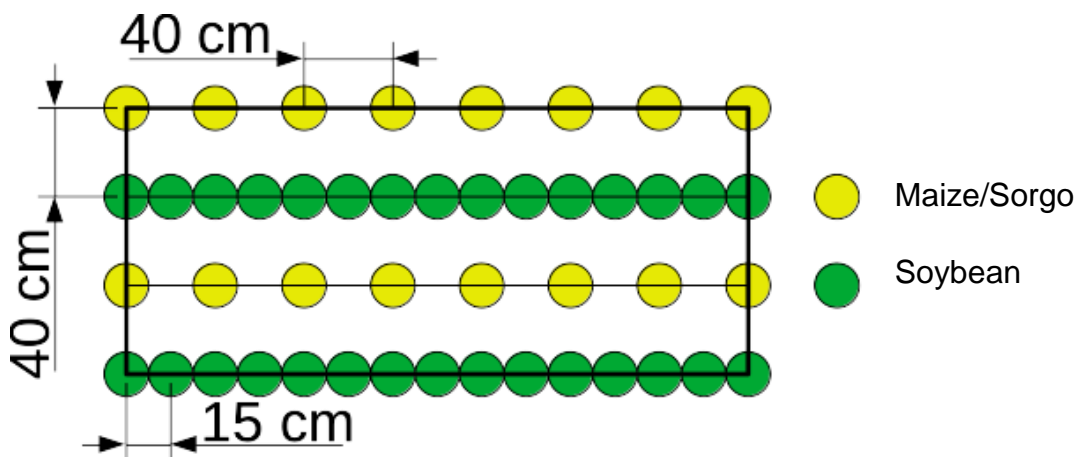
Requirements: P ++

Danger: None

Fertilisation: None

Associations

Maize, sorghum : 40cm rows



Sorgo

General

Morphology: Erect

Root system: Deep

Product: Grain

Planting

Season: Wet Season

Seed depth: 4-5cm

Sowing: Seedhole (3 seeds, start at 1 plant), 10 to 15 kg/ha

Soil preparation: None

Spacing: 50cm x 40cm

Cultivation time

Non-productive: 9-13 weeks

Productive: 1 week

Maintenance

Weeding: 3,5,7 WAP



Plant protection information

Family: Poaceae

Rotation break: 3/4

Risk: Insects +

Fertilization and soil protection

Requirements: N ++

Danger: Depletion++

Ruminant M. (planting): 6-7 t/ha

Chicken M.: 1-2 t/ha

Associations

Bean/arachid/soybean/ cowpea or desmodium : 40cm rows

