INTRODUCTION

Groundnut and soybean do well when they are grown immediately following a well-managed and fertilized crop such as maize. This is because groundnut and soybean are good at utilizing residual nutrients. For best results, groundnuts and soybean should not be grown in the same field two years in a row. Therefore best to rotate with other crops such as maize. This reduces damage by weeds, soil-borne diseases, and soil-dwelling pests.

Groundnuts and soybean can be grown in a wide range of rotations and can follow any cereal or root & tuber crop, for example, maize, sorghum, pearl millet, cassava, sweet potato or sunflower.

To minimize diseases and pests, groundnuts and soybean should not be sown after any legume, cotton or tobacco crop to minimize pest and diseases. Wait at least two years. Although groundnuts and soybean are tolerant to droughts, adequate moisture in the soil at sowing time results in better germination and yields.

SOIL CONDITIONS AND MANAGEMENT

Select well drained soils. Avoid land laying on steep slopes, near swamps, very sandy soil, weedy areas especially with Kapinga grass. Rotate groundnuts and soybeans after cereal or root & tuber crop, for example, maize, sorghum, pearl millet, cassava, sweet potato or sunflower. Wait at least two years in case of cotton or tobacco. Prepare the land well before rains start. Make ridges along the contour lines if the area is sloping to avoid erosion.

Benefits of tilling the soil

- Helps control weeds by uprooting or burying them.
- Softens the surface of the soil and prepare a good seedbed for easier seeding and seed germination.
- Exposes the soil organic matter to oxygen which accelerates decomposition of organic debris and releases soil nutrients for crop growth.
- Reduces compaction of the soil and reduce its bulk density to allow for better rooting of seedlings and better crop growth.
- Helps improve the infiltration of water.
- Incorporates any organic materials, lime or basal mineral fertilizers dosages.
- Helps control various pests and diseases associated with soils.

LAYOUTING CONTOUR LINES ACROSS SLOPE

In some situations, the existing ridges have been destroyed and new ridges have to be re-established. These new ridges need to follow the contour lines of the field (in case it is sloping) to avoid erosion from water flowing down too fast. The A-frame is a tool that can be used to make new contour lines. A-frames are easy to assemble and commonly used.

IMPROVED YIELDS THROUGH NARROWER RIDGE SPACING:

Farmers used to establish ridges at 90 cm for maize; if groundnuts or soybean were then planted on the same ridges, the plant density was too low and yields suffered.

Since the Sasakawa 2000 project in the late 90’s, many farmers are now planting maize at 75 cm between ridges so the problem of establishing new ridges for groundnuts or soybean is not common anymore. But some farmers may still plant maize at 90 cm or even wider which is wasting space and lowers yield.

It is now recommended to make ridges 75 cm apart and about 50 cm wide and plant in double rows (rather than single rows) on the ridges. This will require more labor but this is more than compensated by the higher yields. If the land is flat, ridging is not required so there is no extra labor requirement.

Doubled-up legume cropping: this is the practice where one of the rows on the same ridge is planted with pigeonpea while the other is planted with soybean or groundnut. This improved yields and soil fertility and soil structure. We will further discuss this during the crop management training in October.

Ridge Spacing:

- Spacing between ridges of groundnuts or soybean MUST be 75 centimeters (this will allow greater plant density and will increase yields)
- The ridge size MUST be at least 50 centimeters wide to allow two-row planting within the ridge (the double row also increases plant density and increases yields).

<table>
<thead>
<tr>
<th>Soybean (5cm within rows)</th>
<th>Plant Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants/ha</td>
<td>ridges at</td>
</tr>
<tr>
<td></td>
<td>90 cm</td>
</tr>
<tr>
<td>single row</td>
<td>224.334</td>
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<tr>
<td>double row</td>
<td>448.668</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Groundnut (15cm within rows)</th>
<th>Plant Population</th>
</tr>
</thead>
<tbody>
<tr>
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<td>ridges at</td>
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<td>90 cm</td>
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<tr>
<td>single row</td>
<td>74.853</td>
</tr>
<tr>
<td>double row</td>
<td>149.706</td>
</tr>
</tbody>
</table>
Due to the lack of mechanization tools for tillage operations, smallholder farmers rely on hoes to make ridges. Ridges provide loose soil to ease planting and root development. The ridges enable farmers to control erosion in their field too. The farmers have to:

- Mark out the field contour lines using A-Frame or similar equipment of choice.
- In an existing field with known contour lines, re-align your planting ridges to the marker ridges.
- Prepare ridges at 75 centimetres apart across the slope.
- Each ridge must be at least 50 centimetres wide to enable double row planting of 30 centimetres apart for groundnuts and 15 centimetres apart for soybeans.
- The height of the ridges must be not less than 30 centimetres.
- **Avoiding erosion due to heavy rainfall**
  - Rainfall is likely to become more unpredictable
  - To avoid erosion with heavy downpours - build tier or box ridges 20 cm high every 2 m alternatively along the ridges to conserve water - these tier or box ridges can be opened to drain the excess water.
- Repair foot paths and farm boundaries accordingly.
- Fix all gullies that need land reclamation and provide check dams where necessary.