Sesame السمسم

***Seasamum indicum* L.**

Sesame crop which has begun flowering

Organic cultivation of sesame

- It is an annual plant, which grows either bush-like or upright, depending on variety, to a height of 1-2 m. Its vegetation period is generally around 3-4 months. The oil plant has been grown since the beginning of arable cultivation, and originates from the dry bush savannah of tropical Africa, and spread from there to India and China, where it is still widely cultivated.

Climate requirements

- Sesame needs a constant high temperature, the optimum range or growth, blossoms and fruit ripeness is 26-30°C.
- The minimum temperature for germination is around 12°C, yet even temperatures below 18°C can have a negative effect during germination.

- Pollination and the formation of capsules is inhibited during heat-wave periods above 40°C. sesame is cultivated in cooler regions as a summer crop, and in warmer climes during the cooler season.

Water

- Good harvests can be expected when rainfall of 300-600 mm is optimally spread throughout the vegetation period. Optimum distribution means: 35% before the first cusps are formed, 45% during the main blossoming period, 20% during the ripening period and drought, if possible, during harvesting.

- During each of its development stages, the plant is highly susceptible to water-logging, and can therefore only thrive during moderate rainfall, or when irrigation is carefully controlled in drier regions.
- Due to its tap roots, the plant is highly resistant to drought, and can provide good harvests even when only stored soil water is available

Soil requirements

- A wide range of soils are suitable for sesame cultivation; optimum are well-drained, loose, fertile and sandy alluvial soils that have a pH value between 5.4 and 6.7.
- Heavy, water-logged soils, as well as soils with high salt contents are not suitable; salt contents which would hardly affect cotton or safflower can already kill off sesame plants

Sowing methods

- **Seedbed preparation**
- **Manual sowing**: Small-hold farmers will often sow by hand. 2-3 weeks after they have been sown, the plants are singled. This method requires 5-10 kg/ha of seeds.
- Mixing them together with sand, soil, ash or dried, sieved manure or compost will help make growth more uniform, and also save on seeds.

- **Mechanical sowing:**

Drilling machines for finer vegetable seeds are best suited, although normal grain-sowing machines can also be used when fine, dry sand of the same grain size is mixed in with the seeds.

- Drilling seeds need 2.5-3 kg/ha; when mixed crops are sown, only 1.5 kg/ha is required.

Crop density

High yields normally require high densities:

Non-branching varieties:
250,000-350,000 plants/ha
Distance between rows: 30-45 cm
Distance within the rows:7.5 cm

Branching varieties:
150,000-200,000 plants/ha
Distance between rows: 50-60 cm
Distance within the rows:10-15 cm

- **Singling**
- In order to achieve an optimum crop density, branching varieties should be singled out to 6-10 cm, or definitely less than 15 cm distance within the rows.
- Non-branching varieties:
- Single out to 12-15 plants per meter
- Branching varieties:
- Single out to 8-10 plants per meter

Crop rotation

- Typical crop rotation partners include cotton, grain legumes (peanuts, varieties of beans, etc.), maize, dry rice.

Mixed crops

- With annual crops:

Sesame is cultivated in many countries as part of a mixed crop with cotton, maize, millet, peanuts, soya or Pharsalus-species. In the case of mixed cultivation with cotton and sesame, each yield is less than it would be if planted alone, although the 'Land Equivalent Ratio = LER' is nevertheless higher.

- With perennial crops: Cultivation between the rows with young perennial crops is
- also possible

Supplying nutrients and organic fertilization management

- **Organic fertilizers:**
- The most important methods of applying fertiliser on organic sesame cultivations are:
- · The use of green manure, inclusion of legumes in crop rotation, and the use of organic manure and compost manure.

- The supply of phosphorous can be a limiting factor for high sesame yields.
- Phosphorous deficiency can be alleviated with rock phosphate and bone meal, which should then be applied before the soil is prepared.
- The amount and type of phosphate made available to the plants can be improved by the symbiotic relationship with mycorhiza, As this has the effect of increasing the surface area of the root system. By excreting a variety of substances, e.g. phosphates, it can even make organically bound P available to the plants.

- The supply of potassium is usually not a problem. Calcium and Magnesium are of greater importance, as the plants require large quantities of them, and e.g. can be supplied with magnesium-rich lime

Organic foliar spraying

- Organic foliar spraying can provide a large proportion of the fertilizers necessary, and help balance out deficiencies. They are applied in two lots:
- After singling and as blossoming commences.
- · Animal liquid manure is diluted 1:5 with water.
- · Cattle manure is dissolved in water.
- · Plant extracts: green, chopped legume leaves and other nutrient-rich plant parts are left in water fro a few days to ferment.:
- · A watery compost extract: the best way is to apply amounts weekly in low Concentrations.