

## Cultivation of sesame in Egypt

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### Introduction

Sesame, (*Sesamum indicum* L.), is an ancient oil crop supplying seeds for confectionery purposes, edible oil, paste (tahini), cake and flour. It is typically a crop of small farmers in the developing countries. Sesame is considered as a drought tolerant crop (Jefferson, 2003).

The plant is usually 60 to 120cm tall and the fruit is a dehiscent capsule held close to the stem. When ripe, the capsule shatters to release a number of small seeds. The seeds are protected by a fibrous 'hull' or skin, which may be whitish to brown or black depending on the variety. 1000 seeds weigh some 4-8g. The seeds have a high oil content of 44-60%.

The seed of sesame contains about 50 to 51% oil, 17 to 19% protein and 16 to 18% carbohydrate and that the oil is edible, odourless and semi-drying, containing oleic, stearic and palmitic acids. Sesame oil serves as antioxidant in the manufacture of margarine and salad creams, and as a fixative in the industries for making of perfumes and cosmetics (Yermanos et al. 1972). It is also used as carriers for fat-soluble substances in pharmaceuticals and insecticide manufacturing (Godin and Spensley, 1971).

In Egypt, sesame is considered a food crop rather than oilseed crop because most of its seeds are consumed directly. It is grown in many governorates and ranks first among the cultivated oil crops in Ismailia Governorate (El-Bramawy, 2006). Total area under sesame production in Egypt has increased from 11,264 ha in 1961 to 36,907 ha in 2010 and the productivity increased from 1,145.7 kg/ha in 2005 to 1,250.3 kg/ha in 2010 (Faostat, 2012).

### Soils

Sesame is adapted to a range of soil types, but performs best on well drained, moderately fertile soils of light to medium texture and neutral reaction as well as that have a pH value between 5.40 and 6.75. The plant is extremely sensitive to water-logging. When irrigated, sesame grows better in sandy than in heavy soils because it is very sensitive to high soil moisture content. It is not recommended to plant sesame on sloping ground, because its need of weed-free seed beds and its slow rate of early development can lead to erosion.

### Climate

Sesame needs a constant high temperature, the optimum range of growth, blossoms and fruit ripeness is 30 to 35°C. Sesame only grows well in a warm climate and in East Africa it is only grown from sea level up to 1500 m. Most varieties of sesame are photoperiod sensitive.

### Cultivars

Production of unit area from sesame seeds depends on the accuracy of the application of technical recommendations and the recommended cultivars which produced by the Egyptian Ministry of Agriculture which is highly productive and resistant to wilt disease and high quality. The following cultivars are cultivated in Egypt:

- 1- Giza 32: One of Unbranched cultivars and gives 1700 kg seeds per hectare. It holds three capsules in the leaf pit and the color of the seed is white.
- 2- Tushki 1: One of Unbranched cultivars and gives 1400 kg seeds per hectare. It holds three capsules in the leaf pit and the color of the seed is creamy-light.
- 3- Shandaweel 3: Unbranched cultivars but it can be given from 1-2 branches and gives 1140 kg seeds per hectare. It holds three capsules in the leaf pit and the color of the seed is golden.

The previous three varieties is one of the shatter resistant varieties. These improved shatter resistant varieties have capsules that open slightly at maturity but do not lose much of the seed prior to harvest.



### **Preparing the soil for planting**

Heavy soil plowed twice perpendicular then friable the soils to become soften for seed bed and finally, leveling the soil for easy control of irrigation water. Either in the light soil textures, enough to give one plowed by using the plow disc

### **Sowing date**

Best sowing date of sesame in Egypt from mid-April until the end of May and early or delay it lead to lower the production rate of seeds per hectare.

### **Seeding rate**

An established sesame population of 200,000 plants per hectare is essential for achieving high yields and effective weed control. Depending on the germination percentage of the seed used, a sowing rate of 7-9 kg per ha of hilling in ridges (50 cm apart ridges) will give the required plant density.

### **Sowing method**

Trials showed that the highest seed yields were achieved if sesame was sown at a row spacing of 50 cm; wider rows resulted in decreased weed control and yield, while narrower rows resulted in a

yield reduction. Sesame can be planted in furrows of 10 between hill and 2-3 cm depth with slight soil coverage. Plants must be thinning on one plant in hill after 21 days from planting.

### Fertilizer requirements

The amounts of fertilizer required will vary depending on soil type and cropping history. The following general recommendations should apply:

#### Phosphorus

- Virgin soil: 70 kg per ha of phosphorus, traditionally applied as single superphosphate at 470 kg per ha.
- Previously cropped soil: 35-50 kg per ha of phosphorus as single superphosphate at 230-330 kg per ha.

#### Nitrogen

- Planting after legume crop or fertile soil: Applied of 70 kg N per ha (150 kg urea, or 210 kg ammonium nitrate, or 325 kg ammonium sulphate). Added in three doses, the first after the thinning, and the second two weeks later and third after the second two weeks later.
- Planting after grassy crop or virgin soil: Applied of 20 kg N per ha at sowing time, 30 kg N per ha after the thinning, 30 kg N per ha after two weeks later and 20 kg N per ha when configure the capsules on plants.

#### Micronutrients

The plants are sprayed in virgin soil only when it reaches the height of plant of 30-40 cm created by a mixture of "**Fe EDTA 4.5% + Mn EDTA 3% + Zn EDTA 1.5% + Cu EDTA 1.5% + Mg 4.5 % + B 0.6 % + Mo 0.1%**". Previous elements dissolved in 400 liters of water, then sprayed on plants to twice, the first when the plant height of 30-40 cm and second after two weeks later from the first.

### Irrigation

Irrigation of the most important factors that control the productivity of sesame crop as it is sensitive to irrigation and high humidity ground crops, water stagnation in the field with high temperatures lead to increased activity of fungal wilt. In addition, deprive the plants from water leads to inefficiency in the absorption of nutrients from the soil which leads to weak growth of plants and their vulnerability to wilt disease. Also, increased moisture or thirst leads to the loss of flowers and newly capsules formed, and this ultimately leads to a shortage of the seed yield. Therefore, take into account the regularity in irrigation to be fast irrigation in the early morning or at day end. It must prevent irrigation during the afternoon.

Depending upon the soil type and climatic condition, provide life irrigation at 15 days after sowing, after that irrigation every 12-15 days. During the seed maturity stage, maintain low moisture status because seed maturity is affected. So, stop watering after 85 to 90 days of sowing.

### Weed control

Weed control is important in sesame as seedling growth is slow for the 4 weeks, making them poor competitors. Weed control in sesame implemented by hand hoeing that is effective in controlling weeds with increasing production costs and establishment of side effects when applied intensively and/or repeatedly. Hoeing carried out once or twice depending on the degree of spread of weeds. The first hoeing conducted before the thinning process and the second two to three weeks later.

## Harvesting

Sesame is ready for harvesting 105 to 120 days after planting, dependent on planting date, variety, and climate. Harvest the crop, when leaves and capsules turn yellow and defoliation starts. The capsules at base of plants mature first and then start maturing upwards. Plants should be harvested as and when they are yellowish-brown. After harvest, stock the bundles erect on the threshing floor for five to seven days for drying and then thresh.



## References

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