

## Oils and Fibres

### Sesame (*Sesamum indicum* L.)

French: Sesame; Spanish: Sesamo; Italian: Sesamo; German: Sesam

Crop is relatively drought-tolerant and is often grown where water supply is limited. In these circumstances, plant density should not exceed 250 000/ha. Many varieties are available; local varieties are often relatively unresponsive to higher rates of fertilizer.

General fertilizer recommendations: 90 kg/ha N and, where P is needed, up to 90 kg/ha P<sub>2</sub>O<sub>5</sub>. Responses to N in the range of 7 - 10 kg seed per kg N applied have been reported, depending on inherent soil fertility and rate of N applied. Over 1 t/ha seed has been obtained in India with a fertilizer application of 60 kg/ha N, 40 kg/ha P<sub>2</sub>O<sub>5</sub> and 24 kg/ha K<sub>2</sub>O.

### Castor Bean (*Ricinus communis* L.)

French: Ricin; Spanish: Ricino; Italian: Ricino; German: Rizinus

Bean yields range from less than 0.5 t/ha per season, under conditions of severe growth constraint, to 3.5 t/ha per season, under intensive growth with high use of inputs. The oil content of the beans depends on variety, growth conditions and method of processing; 55 % is reported from USA.

General fertilizer recommendations: Up to 120 kg/ha N per crop, depending on plant type and availability of water; P<sub>2</sub>O<sub>5</sub> at about 30 % of the N rate, or more on P-fixing soil; and possibly K<sub>2</sub>O at half the N rate, or more on K-fixing or on deficient weathered soil.

### Jojoba (*Simmondsia chinensis* Nutt.)

Many-stemmed desert shrub originating from arid deserts of Mexico and USA, 0.6 - 4.6 m<sup>3</sup> in size and aged up to 200 years. Seeds contain liquid wax with multiplicity of uses. Seeds range in size and density from 700/kg under good growth conditions to 5 300/kg under stress. Varieties exhibit a wide range of genetic variation in plant size, fruit density, delay in fruit-bearing, etc. Tolerates hot and dry conditions and is rather salt-tolerant.

General fertilizer recommendations: N needs to be applied before rainfall (or in "fertigation" management), also P<sub>2</sub>O<sub>5</sub>, preferably combined with mulch protection to withstand rapid litter-mineralization caused by extreme surface temperatures.

### Abaca [*Manila Hemp*] (*Musa textilis* Nee)

French: Abaca, chanvre de Manille; Spanish: Abaca, canamo de Manila; German: Manilahanf

Closely related to the banana. Fibres are derived from pseudostem leaf sheaths. Fibre yields range from 0.3 - 1.7 t/ha/year in the Philippines to 1.5 - 2.5 t/ha/year in Ecuador. Grows best in rich volcanic soils. Special care is needed in heavy clays to ensure adequate root functioning.

Nutrient uptake by crop of 100 t/ha above-ground plant material yielding about 2 t/ha fibre: 280 kg/ha N, 30 kg/ha P<sub>2</sub>O<sub>5</sub>, 490 kg/ha K<sub>2</sub>O, 125 kg/ha CaO.

General fertilizer recommendations: N at 50 - 150 kg/ha/year, preferably in split dressings, together with sufficient K<sub>2</sub>O.

### **Ramie [*China Grass*] (*Boehmeria nivea* (L.) Gaudich)**

French: Ramie blanche; Spanish: Ramio blanco; Italian: Ramia; German: Ramie, Chinanessel

Yields up to 140 t/ha/year fresh plant material from 2 to 6 harvests, giving about 1.4 t/ha clean fibre. Fibre has to be degummed from the stems, which requires expertise. Leaves are rich in protein, so forage use is possible. Required water supply is about 140 mm/month; plants do not withstand waterlogging.

General fertilizer recommendations: Split application of 200 kg/ha N, 60 kg/ha P<sub>2</sub>O<sub>5</sub> and 90 kg/ha K<sub>2</sub>O per year. Increasing N rate to 300 kg/ha/year increases leaf protein and residual soil N. Composted decortication waste is returned to the soil in some places.

### **Roselle (*Hibiscus sabdariffa* L.)**

French: Ketmie rose; Spanish: Canamo de Guinea, rosella; German: Rosellahanf

Crop data: Yields up to 70 - 90 t/ha/year fresh plant material, giving 3.5 - 4.5 t/ha clean fibre. Requires good rooting conditions. Time of planting is limited by photosensitivity.

General fertilizer recommendations: Commonly receives from 40 kg/ha N per crop in India where growth is limited by poor supply of available soil nutrients and water and other major constraints, to 250 kg/ha N in Egypt.

On Egyptian soil which yielded 2.84 t/ha fibre without fertilizer, the application of 117 kg/ha N, 77 kg/ha P<sub>2</sub>O<sub>5</sub> and 140 kg/ha K<sub>2</sub>O increased the fibre yield to 4.65 t/ha.

### **Kenaf (*Hibiscus cannabinus* L.)**

French: Kenaf; Spanish: Kenaf; German: Dekkanhanf, Hanf-Eibisch

Yields 0.5 - 2.5 t/ha fibre depending on variety and growth conditions.

General fertilizer recommendations: 40 - 80 kg/ha N, 20 - 50 kg/ha P<sub>2</sub>O<sub>5</sub>, 20 - 80 kg/ha K<sub>2</sub>O. Response to N rather variable but generally around 8 - 12 kg extra fibre per kg N applied.

#### **Further reading**

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*Author: P.D.J. van der Vorm, Department of Soil Science and Plant Nutrition, Agricultural University Wageningen, The Netherlands*