Castor beans : ricinus communis Linn

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MANY people have seen the wild castor oil plants around the metropolitan area, growing in rubbish dumps, and waste lands. But they have not realised that the demand for castor oil has been increasing over the last 15 years. Although one of its main uses is in the lubrication of jet engines, it is also used in plastics, special low temperature lubricants, hydraulic fluids, paints, varnishes, textiles and pharmaceutics.

DESCRIPTION

The castor oil plant, *Ricinus communis* Linn. of the family *Euphorbiaceae*, in its wild state is a tall perennial plant. These are unsuitable for mechanical harvesting, due to their tallness, and to the fact that most of them shed their seeds, although the author has seen some plants that did not dehisce, in fact it was very hard to break open the capsule.

The castor oil plant—an evergreen tree or tall shrub, is 3-15 feet tall. Leaves alternate palmate, deeply 5—many lobed, 1-2 feet in diameter, green or reddish, petioles 10-15 inches in length with conspicuous glands. Flowers without petals, unisexual, in a stout, erect, terminal raceme, the male in the lower portion, the female above. Male flowers ⅜ inch in diameter, shortly pedicillate, with membranous calyx splitting into 3-5 valvate segments, stamens numerous, the filaments crowded and much branched, anther cells distinct, subglobose. Female flowers with a spathaceous caducous calyx nearly as long as that of the male flower, ovary 3-celled each loculus with one ovule, styles three, long or short, spreading, usually bifid, often very large, feathery or papillose, frequently deep red. Capsule smooth or covered with soft brown spines, dehiscent, splitting into three 2-valved cocci ⅜-1 inch long, globuse or ovoid. Seed ovoid with large caruncle. Seed-coat crustaceous, smooth and mottled. Cotyledons broad, cordate or ovate, flat. Endosperm fleshy and oily.

OIL DEVELOPMENT

The oil is laid down very slowly in the first 30 days of seed formation, but increases rapidly in the next 10-20 days. In 50-60 days after dehiscentability the rate is doubled and about 80 per cent. of the total oil is deposited. Thus this indicates the period when castors require maximum nutrition. They should not be under water stress at any period. The oil content continues to increase for 30 days after the dry stage. Therefore harvest can be delayed to 20-30 days after drying of the fruit. This is important for mechanical harvesting, as all the fruits do not ripen together, and, if they do not dehisce, the first fruits can be left on the plant for a month while the others ripen up.

The oil content of the seed is not affected by storage, and having a hard test, storage is easy. Added to this no insect or disease attacks the seed in storage. (At “Bundidup” rats and mice seemed to thrive on them.

Overseas work with Castors show:—

1. Climate.—Castor, which does not tolerate frosts, is a summer growing plant, needing soil temperatures of 58° F. to germinate.

2. Soils.—Castors can be grown on any type of soil except very heavy clay, although soils of high fertility produce rank vegetative growth with lower yields of fruit. Soils that have the ability to warm up quickly in the spring are ideal. They should have a free draining soil, as castors do not like wet feet.

3. Sowing.—Seed can be drilled or sown by hand.

4. Seeding Rate.—Depends on seed size, and ranged from 12-15 lb./ac.

5. Spacing.—Generally three ft. rows with seed 18 in. in the rows, although this varies in different localities.
(6) **Irrigation.**—Castors respond to irrigation. Needing 3-3½ acre feet of irrigation without rain or moist ground is unavailable.

(7) **Manuring.**—Soils high in N. are not suitable for castors as this produces excessive vegetative growth. Castors should not follow a legume crop for this reason. On other soils apply 18-36 lbs. Nitrogen, 45-63 lbs. super, 45-67 lbs. potash per acre.

(8) **Harvesting.**—Where harvesting is done by hand, the worker uses a bag similar to an apple-pickers bag. Then by cupping both hands around the spike, he scrapes the fruit into the bag. By this method a worker can harvest 1,000 lbs of Castors per day.

In the United States of America in certain areas, they have special Castor harvesters, costing £2,500. Harvesting is done by beaters which knock the matured capsules and seed onto a tray from which they are elevated to a hulling and cleaning mechanism. Latest information received, states that special equipment has been developed to adapt conventional harvesters for castor bean crops.

(9) **Yields.**—These range from 800 lb./ac. in India to nearly 3,000 lb./ac. in the United States of America.

(10) **Oil Content.**—In the United States of America, with dwarf varieties, oil content varies from 40 per cent. to 50 per cent. oil.

(11) **Disease.**—Many varieties are attacked by a variety of insect pests, bacterial and fungal disease, attacking various parts of the plant and fruits, all leading to lower yields. At “Bundidup,” the only pest attack was the wireworm attack on seedlings. There was no other pest or disease found on any plant. Even though capeweed nearly was covered with red mite, no mite touched the castor seedlings.

(12) **The Stalks.**—Can be used for fibreboard manufacture or paper making, as they are high in cellulose.

(13) **The Leaves.**—Contain a substance which is toxic to insects, and can be used for the production of insecticides, but need planting near manufacturing centres as costs can be very high.

(14) **The Hulls** or castor cake, left over after hulling the fruit is not used for stock feed (because of the poisonous property Ricin and Ricinine), but for a fertiliser. It contains 4.5 per cent. N and is equal in fertiliser value to fresh barnyard manure.

In conclusion it may be pointed out that although the picture seems all bright, there is a need to develop a variety suitable for harvesting with the existing types of harvesters in use in Australia. There is also a need for a sufficient supply of seed to warrant oil extraction plants processing them. Also there is the point that both plants and seed are poisonous to stock, although it is reported that some cattle and fowls in Africa are unaffected when eating them, but normally stock do not touch castors.

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