

Last updated: 14th October 2002

LINSEED

SEE ALSO EDIBLE LINSEED (SOLIN) and FLAX

Family: *Linaceae*

Genus: *Linum*

Species: *usitatissimum*



Source: <http://wwwcjb.unige.ch.htm>



Source: <http://www.math.iupui.edu/>

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General Background

Names: Fr.: Lins; It.: Lino; Sp.: Lino; Ger.: Flachs; Dtch.: Vlas; Dan.: Hor; Gr.: Linari; Russ.: Len; Yug.: Lan

Linseed is a cool temperate annual herb with erect, slender stems, 60-80 cm tall. A cultivated plant in closely spaced field conditions it has little branching except at the apex. Leaves are alternate, lanceolated and greyish-green with 3 veins. Flowers are 5 petalled in a cluster, bright blue or white in some forms. The sepals are lanceolated and nearly as long as the pointed fruit. The fruit are spherical capsules. The seeds are oval, somewhat flattened, 4-6mm long and are pale to dark brown and shiny.

Linum usitatissimum can be bred with an emphasis on seed or fibre (see [FLAX](#)) production, the classification of a variety depends on the market to which the plants are aimed:

Crops grown for seed: 'linseed' (UK and India), 'flaxseed' (Canada), 'Oil flax' or 'seed flax' (EU).

Crops grown for fibre: 'flax,' 'fibre flax' or 'textile flax' (EU)

Crops grown for seed and fibre: 'dual-purpose flax' or 'flax grown for fibre flax seed'(EU)

In the UK populations of around 550 plants per square metre are normally established from sowing rates of around 700 viable seeds per square metre. Large seeded varieties will require around 64 kg/ha while small seeded varieties will require only around 40 kg/ha. This 20 kg/ha difference in seed rate may be a consideration when choosing varieties. In poor seed bed conditions, seed rate should be increased, especially for the small seeded varieties. (NIAB 2001 Oilseeds Variety Handbook, UK)

Data relating seed size to early plant growth and eventual yield show strong trends for faster emergence, thicker establishment and more vigorous early growth from large seeded varieties. However, in trials that established and grew well, no relationship between seed size and yield

was found. While yield is not limited by seed size, small seeded crops remain at risk longer if growth is slow after drilling. (NIAB 2001 Oilseeds Variety Handbook, UK)

Details of Quality Characteristics

The fatty acid composition of linseed oil is dominated by C18 fatty acids C18:2 (16 % of oil) C18:3 (50% of oil) (Turner, 1987).

TYPICAL % FATTY ACID CONTENT OF INDUSTRIAL LINSEED OIL:

C16:0 6% Palmitic
 C18:0 2.5% Stearic Acid
 C20 0.5% Arachidic acid
 C18:1 19% Oleic acid
 C18:2 24.1% Linoleic acid
 C18:3 47.4% Linolenic
 0.2% Other

Current Production and Yield

Country	Area Harvested '000 ha	Yield (t/ha)
Belarus	78,000	0.28
Belgium-Luxembourg	12,000	1.08
Czech Republic	10,532	0.59
Estonia	300	0.27
France	54,780	0.69
Germany	199,778	1.69
Hungary	1,749	1.03
Italy	1,000	0.70
Latvia	1,900	0.95
Lithuania	8,800	0.31
Netherlands	3,800	1.84
Poland	506	0.97
Romania	2,000	2.00
Russian Federation	92,440	0.20
Slovakia	2,304	0.57
Spain	18,000	0.89
Sweden	14,100	0.43
Ukraine	26,500	0.23
United Kingdom	74,000	0.58

Source: FAOSTAT Statistical Database Results <http://apps.fao.org>

(UK average yield rarely exceeds 2 t/ha, and is usually nearer 1.5 t/ha.)

Currently Linseed is predominantly grown as a source of oil for industrial use in the manufacture of paints, varnishes and linoleum. For information on 'Linola' types suitable for culinary use see edible linseed (SOLIN).

Constraints upon Production

Linseed, like rape, is sensitive to seed bed conditions, and best emergence comes from a fine tilth. The crop can be very slow to establish in cold weather. Evidence from work in field trials shows that small seeded varieties are less vigorous, and with these avoidance of early drilling is particularly important. Winter varieties of linseed have now been developed and perform well providing the crop is well established prior to onset of winter. Weed control in the young crop is essential.

Harvesting can be a major problem with linseed, particularly if the crop is late, incompletely desiccated or lodged. Lodging can be serious in linseed but crops often recover if lodging occurs early in the season. Late lodging severely impedes harvest, with very little bulk in the crop to support itself and allow room for the combine knife to get underneath. Crops must be very well desiccated at harvest to avoid wrapping in the combine, and great care must be taken to ensure thorough penetration of the desiccant into the crop.

The development of stripper heads has been particularly helpful for the linseed crop, as bolls tend to ripen well before the stems are ready for the combine knife. They allow the successful harvesting of later maturing varieties and of more northerly crops than might otherwise be possible, so long as the crops are standing reasonably well.

Markets and Market Potential

Traditionally, linseed has been grown for its oil, which is used in the manufacture of paints, varnishes and linoleum, because of its drying and hardening properties when exposed to the air and sunlight. Breeders have also produced linseed varieties that give oils with fatty acid profiles that make them suitable for culinary uses. This is because these "linola" types,

containing a high proportion of linoleic acid and a low proportion of linolenic acid, have the appropriate stability and shelf life that the industrial types lack. Tests have indicated that these also have a range of industrial applications including specialist oils and inks.

A growing market has been identified for whole seed linseed, in baking and in health foods and for this the traditional “high linolenic” varieties are suitable, as it is only their extracted oil that lacks the keeping qualities for culinary use.

In the UK the crop has shown fluctuations in popularity driven by the shifting balance of world prices compared with other break crops. Its high point, of over 200,000 ha came in 1999 but contracted back to around 70,000 ha in 2000 under the influence of depressed market prices, below £90/t, and diminishing subsidy levels to bring the crop into line with the higher yielding cereal crops. Its future will be largely determined by relative crop prices, its rotational value and as with the 2000/2001 season, the unpredictable, occasional requirement for increased spring cropping after a difficult autumn. (NIAB 2001 Oilseeds Variety Handbook, UK)

Oil: Drying agents. The high linolenic acid (C18:3) content of linseed makes the oil an excellent drying agent for example in paints, resins, inks, soaps, varnishes, wood treatments, linoleum. It is also being investigated for use in the building and construction industry. World production of linseed oil is 1.0 million tonnes, EU-15 usage of linseed oil in the technical and chemical industries reached 60,000 tonnes in 1998 and is expected to equate to 55,000 tonnes in 2004.

Linoleum: Linoleum is made of natural materials: linseed oil, resins, wood, cork powder, calcium, vegetable pigments and hessian (jute). There are new interests in this material and the European market is expected to increase from 36 millions m² in 1995 to 56 million m² in 2003. Linoleum has particular benefits in ‘high-tech’ situations in being anti-static. One kg of linseed oil is required for each 1m² of linoleum.

There is a market for linseed meal as animal feed, also poultry feed as it increases levels of omega 3 fatty acid in eggs. Whole seed is used in the baking and confectionery industries where its health benefits are recognised. Linseed straw also has application in biomass energy burners.

Other Information

While slug and pigeon damage may be serious in some seasons, flea beetle has become the principle pest of linseed. Several diseases can affect linseed causing yield and quality losses, these include *Alternaria linicola*, *Botrytis cinerea*, *Fusarium avenaceum*, *Mycosphaerella linicola*, *Oidium lini*, *Sclerotinia sclerotiorum*, *Phoma exigua* var. *linicola* and *Colletotrichum lini*.

Research

Useful Websites

BioMat Net

[Flax and Linseed \(Linum usitatissimum\)](#)

[UK Government Funded R&D on Crops for Industrial and Energy Uses: Section 1 – Industrial Oils and Fatty Acids](#)

[FAIR-PL97-3884 - CTVO-NET Chemical-technical utilisation of vegetable oils](#)

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References

De Rougemont, (1989). *Crops of Britain and Europe*. Collins: London

NIAB, (2001). *Oilseeds Variety Handbook*. UK

Semundo Ltd, (no date). *Linseed: On the Crest of a Wave*. Semundo Ltd: Cambridge (UK)

Turner, J., (1987). *Linseed Law*. Published BASF (UK) Ltd

