

Post Harvest Uses of Linseed

M.P. Chauhan, Sadhna Singh* and Ashok Kumar Singh

Department of Genetics and Plant Breeding, Narendra Deva University of Agriculture & Technology Kumarganj, Faizabad, Uttar Pradesh, India

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ABSTRACT Linseed (*Linum usitatissimum L*) has been under cultivation since the dawn of civilization. It is an important oilseed crop. Every part of the linseed plant has specific economic importance. It's crushed seed/flour is used for value addition and for making various food preparations. Linseed oil has various industrial and medicinal uses. The stalk or straw is used for making flex fibre and papers. Indeed there is no herb so useful to mankind as is this crop for its interesting characteristics and the distinct ways it can be exploited.

INTRODUCTION

Among rabi oilseed crops in India, linseed happens to occupy the second position i.e. next to rapeseed-mustard in importance from the view point of area as well as production. It is such a valuable crop that every part of the plant has specific economic importance. Its seeds when crushed yield oil. Due to its dyeing properties, the oil is used in paints, varnishes and polymer industries (Gill 1967). Stem yields fibre of good lusture, tensile strength and durability having good blending property. The left over cortical tissue serve as source of wax and raw material for paper industry. Linseed oil is a rich source of linolenic acid (40-60%), an Omega 3 fatty acid which has anti-inflammatory action in the treatment of arthritis. It has also quality in lowering down the cholesterol level in mammals. Lignan present in oil has anti-carcinogenic effect. At present linseed is cultivated in about 448.7 thousand hectares with a contribution of 169.7 thousand tones to the annual oilseed production of the country (P.C. Unit Linseed 2006). Its average productivity is 378 kg/ha. Major linseed growing states are Madhya Pradesh (M.P.), Uttar Pradesh (U.P.), Chhatisgarh, Bihar, Rajasthan, Orissa and Karnataka. The linseed crop maintained its increasing trend in productivity while, the area registered the declining trend resulting in stagnant production. The decrease in area might be due to socio-economic factors as the per capita holding is shrinking owing to population increase, thereby pressing the growers to grow other crops for their sustenance. In order

to increase the area and productivity of linseed, we have to make it more remunerative with added advantages to attract growers. Common people should also be made acquainted with the possible role of flax (linseed) seed in the treatment of cancer, arthritis and cardiological diseases. Keeping this in view use of linseed oil and fibre should be popularized for various post harvest uses in order to increase farmers economy vis. à vis. linseed crop more profitable.

MATERIALS AND METHODS

The linseed seeds were procured from the department of Genetics and Plant Breeding, while other raw materials required for the investigation were purchased from the local market. Linseed based two recipes were standardized and their nutritive value was calculated (Gopalan et al. 1999). The organoleptic quality of different preparations was also evaluated using hedonic scale.

RESULTS AND DISCUSSION

Composition of the Seed

The seed of linseed is small, flat, oval, brown or fawn or yellow coloured, glossy in appearance with mucilaginous taste and oil nature. The chief constituent of linseed seed is 30-45% of fixed oil. It also contains about 6% mucilage which resides in seed coat and about 25% of protein together with wax, resin, sugar, phosphates and xanthophylls, vitamin viz. thiamin, riboflavin and niacin and small quantity of cynogenic glucoside linamarin. Being rich source of alpha linoleic acid it improves immunity and lowers risk of stroke and other cardio vascular diseases.

*Address all correspondence to:
Sadhna Singh
E-mail: dolmanduat@gmail.com

Linseed Edible Products: Considering the importance of linseed in human health two recipes were standardized. These products have gained popularity among nearby rural and urban people.

(i) *Alsi Laddu:*

Ingredients:	=	
Linseed	=	1 kg
Wheat flour/rice flour	=	200 gm
Jaggery/sugar	=	500 gm
Ghee	=	50 gm
Dry fruits	=	50 gm

Method: Cleaned linseed seeds are roasted in a hot pan. Then it is cooled and grinded. Rice/wheat flour is roasted on a low flame in ghee on hot pan. Grinded linseed along with wheat flour/rice and crushed dry fruits are thoroughly mixed in jaggery syrup and made into round balls (laddus).

(ii) *Alsi Lata:* Sun dried saculent flowers of Mahua (*Mahuca lantifolia*) are generally used for making country wine. In the present study a different preparation called Alsi lata was prepared using seeds of lentil.

Ingredients:

Linseed	=	1 kg
Dry Mahua flowers	=	500 gm
Dry fruits	=	50 gm

Methods: Cleaned linseed is roasted and grounded. Crushed Mahua flowers are mixed with grounded linseed and medium size balls/laddus/pancakes are prepared. Daily use of alsi lata is very energetic to health.

Nutritive value and organoleptic quality of above prepared products-*Also Laddu* and *Alsi Lata* is given in Table 1.

Table 1: Nutritive value (per 100 gm) and Organoleptic quality of prepared products.

Nutrients	<i>Alsi Laddu</i>	<i>Alsi Lata</i>
Protein (g)	13.17	13.99
Fat (g)	25.29	26.27
Mineral (g)	4.56	1.85
Fibre (g)	2.99	3.23
Carbohydrate (g)	50.42	26.27
Energy (k cal)	482	399
Calcium (mg)	130.8	134.35
Phosphorous (mg)	265.83	257.10
Iron (mg)	2.07	2.02
Organoleptic quality	Liked very much	Liked very much

Medicinal Uses

Scientific research over the past decade all over the world is indicating health benefits of omega 3 type oils, lignins and other soluble fibres present in the flax seed/linseed (Bajpai et al. 2005). Some of the medicinal uses of linseed seed oil are given as under –

1. Flax seed oil mixed with an equal quantity of limewater, known as Arectal oil, is an excellent applicant for burns and scolds (David and Toms 2006).
2. Rectal injection of 60 ml of oil, given at night and morning has been recommended for piles.
3. Freshly extracted oil is used as a laxative in doses of 30 ml.
4. Linseed oil is a vehicle for irritant drugs.
5. Linseed tea is prepared by boiling one part of linseed with 20 parts of water until grains become soft. The tea is used as a demulcent in cough especially those forms due to irritation of pharynx and upper part of respiratory passage. It is also used as a demulcent drink in intestinal or urinary catarrhs.
6. For the preparation of cough syrup mucilage of linseed (1 in 8 parts of water) is used.
7. Crushed linseed is used in the form of poultice to apply warmth and moisture locally for the relief of superficial or deep rooted inflammation. It is prepared by boiling 28g linseed with 72 ml of water. The poultice may be sprinkled with boric acid previous to application. The poultice mass is enclosed in muslin, the surface of poultice may be smeared with oil to keep it adhering to skin.
8. Linseed/flax seed and its oil have anti-inflammatory action the treatment of arthritis.
9. Feeding linseed and its oil may be indicated in hyperlipidemia to decrease platelet aggregation and also to reduce and control atherosclerosis, thrombosis and myocardial infraction by reducing cholesterol and low density lipids. It also lowers blood pressure.

Industrial Uses

Traditionally linseed has been grown for its oil which is usually used for manufacturing paints, varnishes and linoleum because of its drying and hardening properties when exposed to air and light. Traditionally, Indian farmers apply the linseed oil on the surface of their iron made

implements for protecting against rust as well as on wooden materials for shining and longevity. Raw cold processed oil is used for manufacture of paints and varnishes, oil cloth, printing and lithographic inks, soft soaps, core oil linings and packing, leather finishing compounds, lubricants, greases, polishes and adhesive. Linseed oil fatty acids are used as protective coating and emulsifying agents. Linseed cake is obtained as a by product of oil extracting industry. The residual, left behind after extracting of oil is called cake. The cakes are brown in colour and contain about 3% oil and 24-28% protein and have laxative properties. It is a protein rich palatable feed for live stock. It is fed to the cattle for maintaining their health as well as improving the gloss of their coat. There is market for linseed meal as animal feed and also poultry feed as due to presence of omega-3 fatty acid in them.

Use of Stalk or Straw

Two types of linseed are grown. A flex type linseed which yields low and poor quality oil but its straw gives fibre of good quality and strength. Seed type linseed produces higher seed yield but its stalk gives fibre of poor quality. There are a number of double purpose varieties, developed in India which produces higher seed yield as well as fibre.

Flex Fibre: Harvested deseeded stalks (up to first branching) are completely dried and subjected to wet retting for 2-3 weeks. Fibres are then separated from the vetted stock by scotching and drying. Dried cortical tissue, separated from fibre contains 10% wax. Flax fibre has more strength fitness and durability than the cotton

fibre. This can be blended with cotton, hemp and jute. Blending of flax with cotton will enhance not only its textile qualities but also save cotton. It also mixes well with wool and tussar silk. It is also used for different types of spinning products including manufacture of fine textile suiting and shirting, bed sheets, bed cover, curtains, etc.

Use of Stalk for Manufacture of Pulp: Remaining stalk after extraction of fibre may be converted into pulp which can be utilized for manufacture of high grade paper, cigarette paper, air mail, bond, bible, and other high priced books and writing paper. Safety paper is used for currency notes.

It is therefore concluded that use of value added products of linseed may be important health care food in our daily diets. The diverse uses of linseed will give a new pace of industrialization under environmental friendly conditions. To reach the desired goal India needs to go up stream in value chain by capturing on its efficient and competitive raw material base.

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