

LECTURE 10

Area, production, productivity and importance and byproducts utilization of oilseeds (groundnut, sesame, rapeseed and mustard, sunflower, safflower, castor, niger and linseed)

Edible Oil Scenario in India

India is the fourth largest oilseed producing country in the world, next only to USA, China and Brazil, harvesting about 25 million tons of oilseeds against the world production of 250 million tons per annum. Since 1995, Indian share in world production of oilseeds has been around 10 percent. Although, India is a major producer of oilseeds, per capita oil consumption in India is only 10.6 kg/annum which is low compared to 12.5 kg/annum in China, 20.8 kg/annum in Japan, 21.3 kg/annum in Brazil and 48.0 kg/annum in USA. Many varieties of oilseeds along with tree origin oilseeds are cultivated in India. Among these, the major oilseeds are Soybean, Cottonseed, Groundnut, Sunflower, Rapeseed, Sesame seed, Copra, Linseed, Castor seed and Palm Kernels. India occupies the place of pride as the world's largest producer of Groundnuts, Sesame seeds, Linseeds and Castor seeds. In India, oilseeds are grown in an area of nearly 27 million hectares across the length and breadth of the country. Depending on the period of cultivation, the oilseeds are classified as '*Kharif Crop*' and '*Rabi Crop*'. The *Kharif Crop* that is dependent on the Monsoon is harvested around October-November each year. On the other hand, the *Rabi Crop* is harvested around March-April each year.

The major oilseeds of India are groundnut, rape seed mustard, linseed, sesame and castor. Groundnut and rape seed mustard account about 85 percent of the total production of oilseeds in the country. In other words, groundnut among the major oilseeds is accounted as about two third, mustard seed one fourth of linseed and sesame five percent of castor, and three percent of total production. Soybean, sunflower, safflower, cotton seed and coconut are the other important oilseeds produced in India.

Rapidly increasing population and changes in dietary habits associated with urbanization increased demands for food and fuel. Non-true oilseed crops like cotton, maize, etc. are contributing up to 73% towards the national edible oil production in the country, while conventional oilseeds (rapeseed & mustard) rank second and contribute about 18-20% in the domestic edible oil production (GOP, 2006-07). Edible oil seed crops are classified as conventional (rapeseed, mustard, sesame, groundnut), non-conventional (sunflower, safflower,

soybean) and non-true oilseeds (cotton, maize and rice bran). Non-true oilseed crops are contributing upto 70% towards the national edible oil production in the country whereas the non-conventional oilseed crops share about 6% in the local oil production (GOP, 2006-07).

IMPORTANCE AND BYPRODUCTS UTILIZATION OF OILSEEDS

Groundnut

- ✓ Groundnut and its products have wide variety of uses as roasted nuts and proteinaceous products.
- ✓ Groundnut oil and butter are good cooking material.
- ✓ By products like cakes and meals are animal feed components contains 40-50% protein, 6-12% fat and traces of vitamins.
- ✓ Groundnut milk acts as supplementary source to cattle milk.
- ✓ Variety of biscuits and cookies are also prepared from groundnut.

Sesame

- ✓ Sesame oil is used to repel insect
- ✓ Oil is good substitute for olive oil in salads, pickles and in cooking.
- ✓ Oil is used in manufacture of soaps, paints as lubricants and illuminants
- ✓ Sesame seed fried and cooked used in soups.

Rapeseed and Mustard

Rapeseed and mustard play an important role in oil seed production, as they are the major group of winter oilseed crops and contribute upto 18% of the domestic edible oil production. Due to the presence of higher erucic acid and glucosinolates, rapeseed and mustard oil is not regular cooking oil. Glucosinolates are sulfur containing compounds that occur pre-dominantly in brassica spp. These substances can lower rapeseed cake palatability and thus produce a range of nutritional disorders in farm livestock.

Oilseed rape (*Brassica napus* L.) has become one of the most important oil crops and at present, is the third largest source of vegetable oil all over the world. Conventional rapeseed and mustard varieties impose health concerns due to the presence of erucic acid in oil and glucosinolate in meal. Canola has the advantage over other vegetable oils because it contains lowest content of saturated fatty acids and moderate content of poly-unsaturated fatty acids. Canola oil is low in erucic acid (<2% in oil), glucosinolates (<20 micromoles per gram in meal) and has a lower level of saturated fats (only 6%) than any other vegetable oil. It has a high proportion of un-saturated fats containing a favorable mix of both mono and poly-unsaturated fatty acids, which makes it favorite cooking oil.

Sunflower

Sunflower is a robust oilseed crop, the seeds of which contain about 20% protein in addition to 40—50%, oil which has a mild taste, pleasant flavour, good keeping quality with acceptable amounts of vitamins A, D and E. Hulls obtained during decortication of sunflower have high fibre content and can be used as a roughage in certain animal feeds. Alternately, they can be used to produce heat by burning, as they yield the same amount of heat as lignite coal.

Safflower

Large scale cultivation of safflower, containing 35 to 45 percent oil, has started about 25 years ago in India. Traditionally known as source of dye in ancient India, the safflower has attained considerable importance as an oilseed crop. It is cultivated in many states of India and numerous races of this crop are under cultivation, varying markedly in botanical features and in oil and dye contents. It is highly branched, herbaceous, thistle like annual, the spinous variety of which is valuable particularly for oil production. Unfortunately, being a crop identified for edible oil. The oil content in seeds is the most important product. The cake obtained from decorticated seeds (40% protein) is used for cattle feed while that obtained from undecorticated seeds is used for manurial purposes (20—22% protein). The cake does not get rancid, if stored in dry condition. Its application as manure greatly improves the physical properties of heavy soils. The seed and cakes are used as poultry feed. Safflower flour also contains lignin glycosides which impart a bitter flavour and has cathartic activity. These can be eliminated or reduced to a low level in the preparation of concentrates.

Castor oil

- Purgative as medicinally as cathartic & obstetrics
- Skin ointment
- Soothing agent to eye applied after removal of foreign bodies
- As resins
 - ✓ Surface coating to household articles, furniture, refrigerators
 - ✓ Base materials for several paints, enamels & varnishes of super quality
- Manufacture of leathers, adhesives, synthetic perfumes & flavors
- Variety of rubber goods, hair oils
- Clear bright colors in dyeing fabrics
- For soaking raw skins in fur trade

Niger

Niger is one of the minor oilseed crops in India grown on hill slopes and marginal lands mostly in tribal areas. Niger gives good cooking oil with nutty taste and pleasant odour which can also be used in cosmetics and perfume industry and for lubrication. Niger contains 85% poly unsaturated fatty acid mostly comprising of linoleic and oleic acid. Hence it is good edible oil. The edible oil is pale yellow in colour. Niger oil is used without any refining. Niger contains 37 to 43% oil. It is good cooking oil. After extraction of oil, the oilcake contains 24 to 34% protein and 8 to 24% crude fibres.

Linseed

- It is primarily considered for fibre - FLAX
- In India primarily for oil seed
- Entire plant has usage
- Oil
 - ✓ 80% for industrial purpose
 - ✓ Very small scale for direct consumption
 - ✓ Rich in Linolenic acid (66%)
 - Perfect drying oil, used in paint & varnish industry
 - ✓ Used for manufacture of lithographic inks and soaps and coating of high ways
 - ✓ After hydrogenation, substitute for tallow (hard fat from animals)
- Oil cake good for milch animal & as manure
- Stem yield good quality fibre (linen) having strength and durability
- Fibres are lustrous and blend well with wool, silk, cotton
- Strong canvas, suiting, shirting and various indispensable products for defense purposes
- Woody matter for high quality paper

Multiple choice questions

1. India stands _____position in oilseed production in the world
a. 5 b. 6 **c. 4**
2. Edible conventional oil seed crops are _____
a. **Ground nut** b. Sunflower c. Safflower
3. Non-conventional oil seed crops are _____
a. Groundnut b. Mustard **c. Soybean**

4. Winter oilseed crop _____
a. Groundnut b. Sunflower **c. Rape seed**
5. _____ is known as source of dye in ancient India
a. **Safflower** b. Sunflower c. Linseed
6. Linolenic acid content in Linseed
a. **66%** b. 56% c. 46%