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LINSEED : PRODUCTION IN EUROPE AND POTENTIALITIES FOR THE FUTURE

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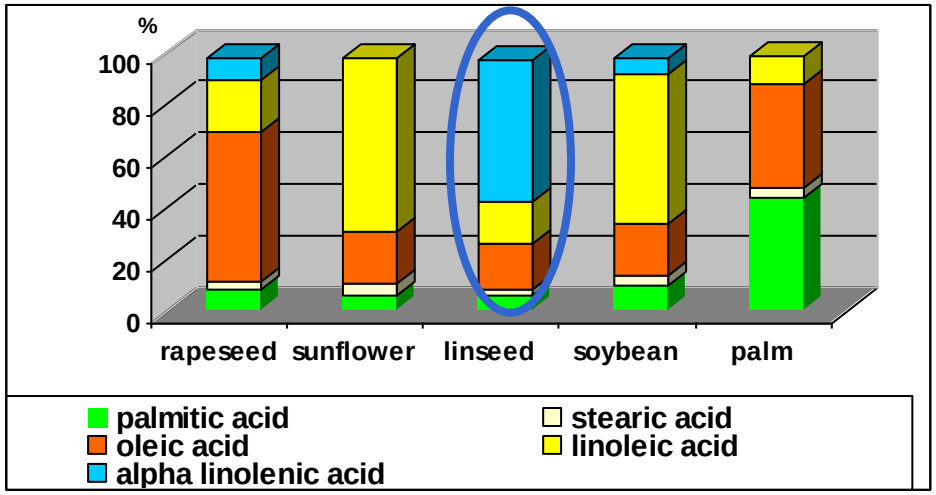
Production in Europe

Linseed : an original crop

- Linseed or flaxseed crop (winter and spring types) : well adapted to cultivation under temperate climates (Europe, northern American continent)
- Grown mainly for the grain production (+ potential by-product = fibres of the straw) # Flaxseed which is cultivated mainly for textile fibres (+ by-product = seeds)
- Small size seeds (thousand seed weigh : 5 to 10 g)
- High oil content of the seeds (38-40 % at 9% of humidity) and interesting protein content (22 %)
- Very high linolenic or omega 3 content (> 54%)

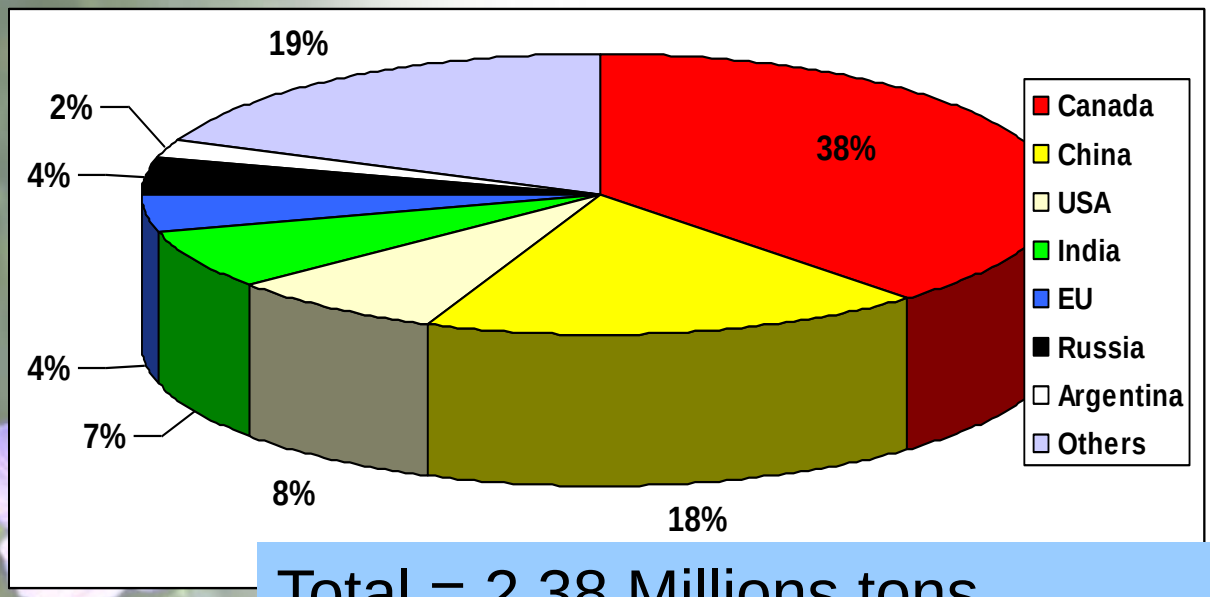


Usages of linseed crop are linked to the omegas 3 content

- Traditional outlets in Europe :
  - **Oil** : omega 3 = great siccativity and reactivity of the oil => linoleum, paints, inks …for industrial non food markets
  - **Meal** : appreciated by the farmers for cattle feeding in western Europe (France = first consumer)

- Emerging new markets in Europe based on the **whole seeds** valorisation in the feed and food industries :
  - Omega 3 = nutritional properties
  - Feeding : omega 3 enhancement of the lipid fraction of animal products (eggs, milk, meat..) thanks to the introduction of extruded linseed grains in feed formulations in order to increase the linolenic acid intake of the population
  - Food : Lin seeds grain incorporation in bread, cakes .. to be directly consumed

Linseed production in the world



Total = 2,38 Millions tons

Linseed production in the world in 2009

source : Oil World and et bulletins Agriculture Canada 2010

- Minor crop : 1% of the oilseed crops total surface around the world
- Canada : most important Linseed producer (650 000 ha harvested, 1,4 t/ha in 2009) and first ranking Linseed exporting country

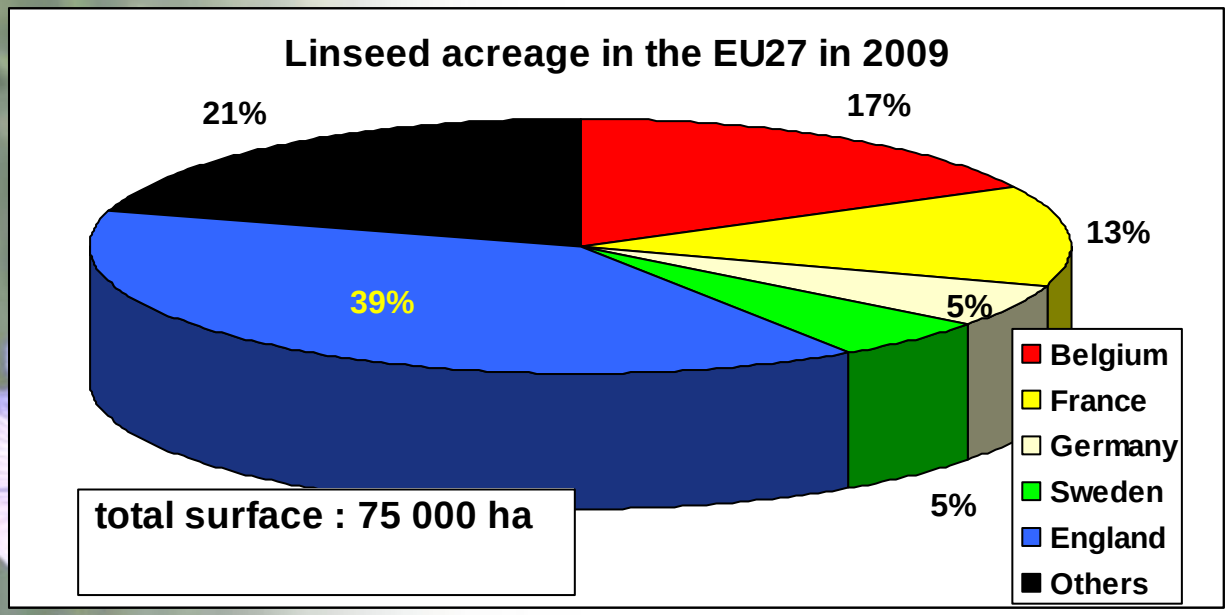
European Union : most important linseed consumer in the world

Attempts to outlets breakdown in tons of seeds (informal data and information provided by the operators, Onidol Linseed study, summer 2008)

Crushing (Benelux, Germany)	440 to 450 000 tons
Feeding (as whole seeds)	100 to 120 000 tons
Food (direct human consumption of seeds)	30 000 tons ?
TOTAL EU	540 to 600 000 tons

NB : Lin Oil use in human food is supposed to be still weak in Europe

The European linseed production cannot meet so far the local industrial needs



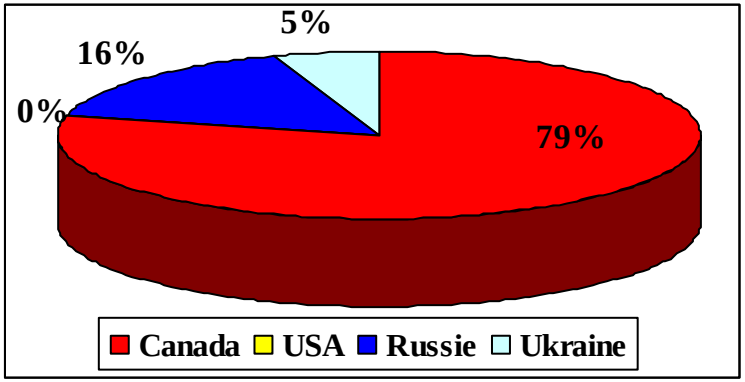
Sources : Eurostat, Oil World 2010

- UE : small seeds producer (108 000 tons in 2009, i.e. less than 20% of the needs) because of :
  - Low surfaces
  - Low yield (1.5 t average in 2009)
- England : first European producer
- France : variable and quite low production : 1992/2010 average acreage = 12 483 ha/year, mean yield 2005/2009 = 2.1 t/ha/y

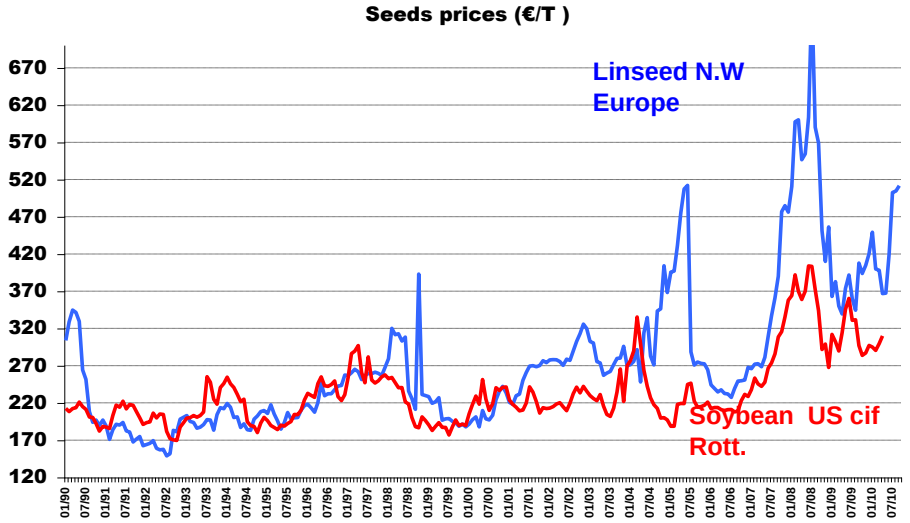
European Union depends on world supply

- EU : strong dependence on extra- EU imports for its Lindseeds industry (500 000 - 550 000 tons a year)
- Most imports coming from Canada, but recent increasing role of the eastern countries (Russia, Ukraine..)
- High volatility of the Linseed prices
- Huge sensitivity to seeds offer variations (great impact of Canada supply)

UE Linseeds imports in 2009 (531 000 tons)



Source : Oil World 2010



Source : Oil World 2010

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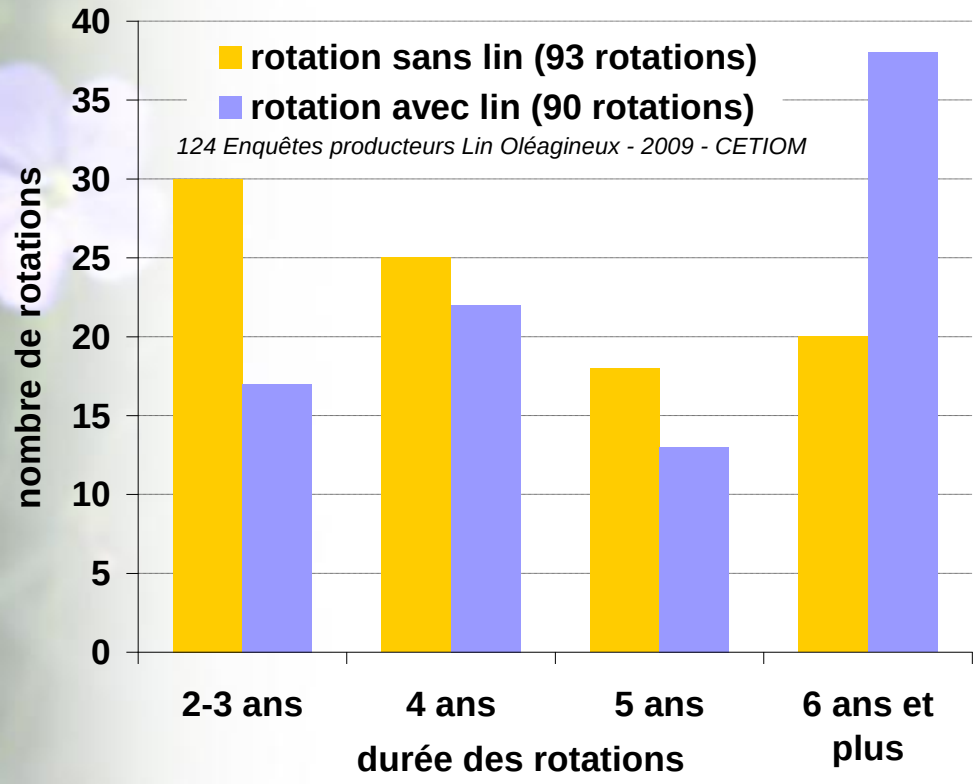
Potentialities for the future

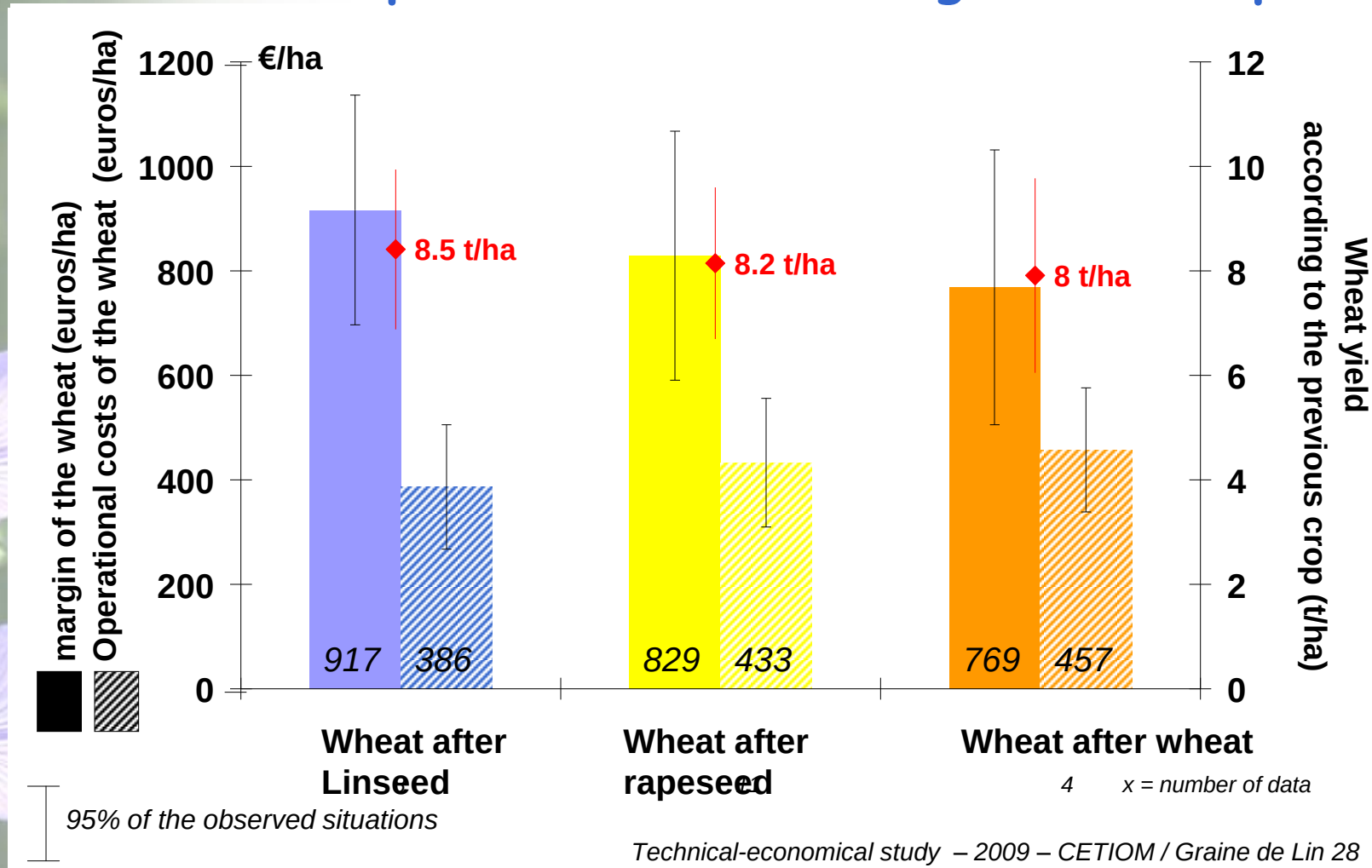
Linseed : an environmental friendly crop
1) good solution for longer crops rotations



Source : 124 farmers survey; CETIOM 2009

- Thanks to linseed crop, short rotation decreases of 20 % in our study
- Linseed introduction can contribute to diversify, decrease chemical inputs and to cut weeds, fungi cycles of the dominating cultivation of the area (cereals, rapeseed..)

Linseed : an environmental friendly crop 2) good economical impacts on the following wheat crop

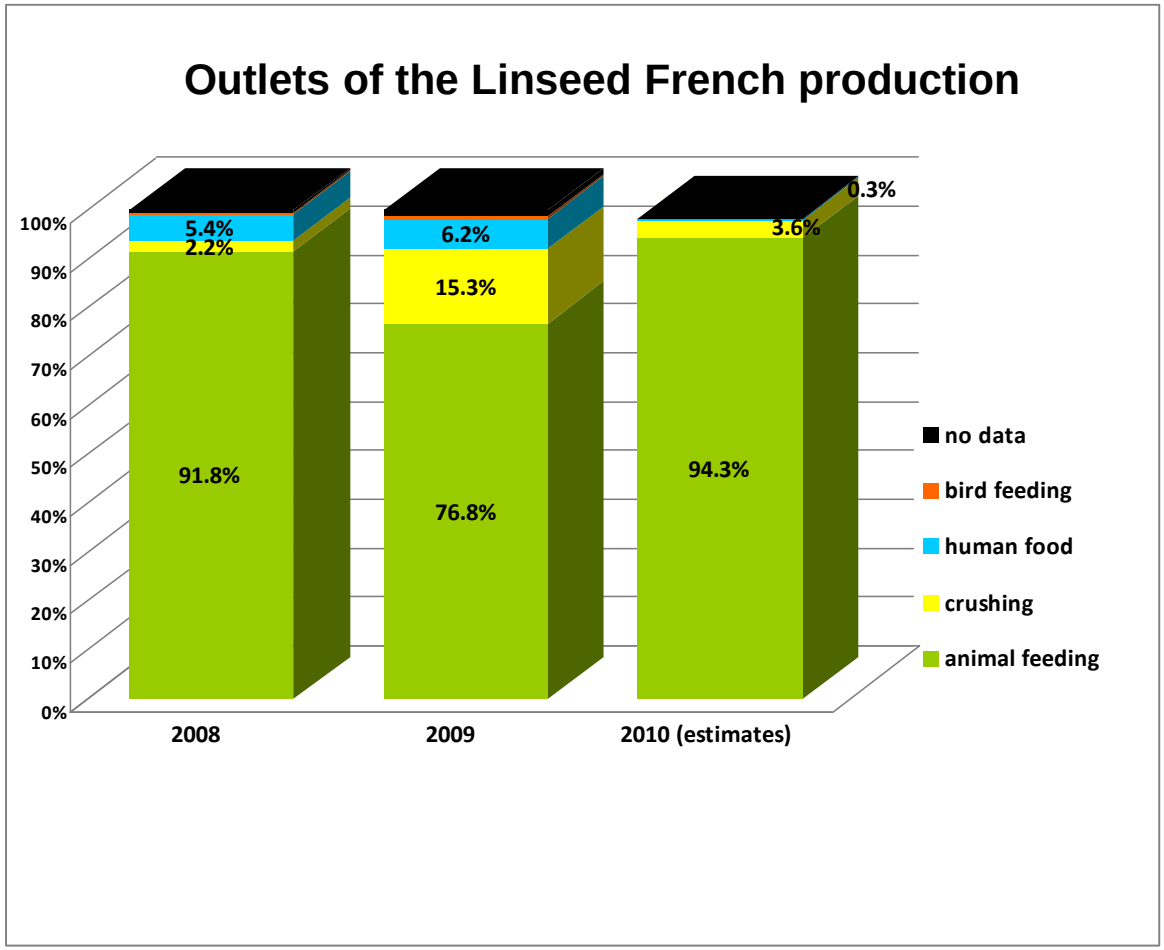


Technical-economical study – 2009 – CETIOM / Graine de Lin 28

- Linseed as previous crop lead to express productivity gains (+0.3 to 0.5 t/ha) and increased economical results on the following cultivated wheat (less operational costs due to lower inputs of herbicides, fungicides, and nitrogen fertilizer)

Feed and food markets are able to pusch on production chain, the French example

- 50 % of the linseed in France is produced under contract, IP process including quality requirements (like ω3 content)
- Major outlet for the linseed cultivated in France : use as whole seed for animal feeding and then naturally ω3 enhancement of the related food products
- Outlets may vary according to the world market situation (crushing = opportunity market, food = high added value but small volumes)



- Organic farming : not expanded in Europe because of the poor yields got in this way (0,3% of the surveyed outlets in France, ONIDOL 2009)

Conclusion on the current situation of the Linseed production in Europe - based on the ONIDOL-CETIOM study 2008-2010 (French case)

➢ Good Points :

- Original composition of the seed (ω3)
- Good agro-environnemental impacts (breaking crop, moderate inputs needs, carbon impact..)
- Genetic progresses in varieties
- Know-how and efficient organisation allowing IP and high quality production
- New emerging markets driven by the omegas 3 nutritional and healthy effects (direct or through animal product)
- Huge needs of seeds for crushing industry but low value

➢ Weak Points :

- Lack of competitiveness of the European seeds compared to extra UE imports (gap of 100 €/t between imports and IP French production in 2009)
- Quite low and variable yields (1.5 to 2.5 t/ha)
- Logistic and storage difficulties for cooperatives
- Small produced volumes
- Insufficient R&D and developments efforts in agriculture sector

• drawback today , advantage for tomorrow : the straw

FUTURE FOR LINSEED IN EUROPE (1)

SHORT TERM (< 3-5 years) : promising perspectives for doubling the surfaces in Europe ?

- **Sharp decrease of the production in Canada in 2010** (- 55%) and consequences of the GM contamination of imported linseeds from Canada => high prices (>570 €/t CIF NW Europe) and pressure on seed supply => opportunities for 2011 and 2012 linseed planting in Europe including for crushing industry
- **Environmental constraints** : need of adapted breaking crops in order to improve the sustainability of the cropping systems in Europe (Role of European and member state regulatory and agriculture policies)
- **Expected increase of the use of linseeds in animal feeding** for improved nutritional and healthy value of the food in France (accumulation of scientific evidences and encouragements of the sanitary authorities) but also in other European countries => growing demand of IP and high quality seeds cultivated at local level (in France 50 000 tonnes of Linseeds in 2012-2013 according to industrial operators)
- **Starting direct use of Linseed products for food** : oil (in margarines for example), flour… in parallel to the existing direct uses of the seeds in food sector

FUTURE FOR LINSEED IN EUROPE (2)

MEDIUM TERM (+ 5 years) : durable Linseed cultivation in Europe (×3, ×4 European surfaces ?)

- Extension of the integrated ω3 enhancement, healthy and environmental friendly (carbon impact) production chain **from feed to human food** in Europe, America..
- Increased Linseed oil for human consumption but needs for improving the stability of the oil (refining process, mix of oils, fatty acid profile ..)
- **Green chemical Directive REACH** → possible coming back of linseed oil in the formulations of paints, some needs of Linseed composition change ?
- **Green chemical and bio-sourcing attitude**: innovative derivatives of linseed oil still under research especially in the polymers and polyurethane fields
- **Valorisation of minor components** of the seed like lignanes in the cosmetic fields.
- **Valorisation of the straw** as renewable fibres sources for biomaterials in addition to other green fibres (local projects) => better economics of the crop

But efforts are required

- Genetic progresses have to continue
- More R&D efforts are needed at different levels : agronomy, environmental evaluation (greenhouse impacts) at crop and cattle production stages, health impacts of linseed introduction in the food, green chemical (new derivatives)..
- Industry has to accept to pay more for quality and IP local production and agriculture has to be able to meet the industrial requirements in terms of volumes and quality.
- Operators from agriculture and industry have to establish contracts allowing a good share of the risks and of the value

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Thanks to my colleagues of CETIOM
pour their contributions to the 2009-2010 Linseed study

and

Thank you for your attention