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THÜNEN

Crop Portrait RAPESEED

by agri benchmark

Rapeseed or Canola?

During World War II Canadians imported rapeseeds as a source of natural lubricant oil. They soon realized that this crop thrived in Canadian conditions. Yet, promoting a crop called rapeseed placed an impossible task on Canadian marketers, who hit an ingenious solution by using an acronym from the words of the main organization promoting rapeseed cultivation: Canadian Oil Association, thus CANOLA.

Rapeseed Production Systems

One product – many ways to produce around the world

Top 5 Countries Rapeseed Production Average 2018 - 2020, in metric tons

- CANADA 19.4 Million
- EU 17.9 Million
- CHINA 13.2 Million
- INDIA 7.8 Million
- UKRAINE 2.9 Million

Country	Typical Farm	Specific location	Rapeseed Acreage	Tillage	Exchange rate (2019)
UK	UK800CAM	Cambridgeshire South East England	298 hectares	no-tillage – one pass seeding (direct seeding)	1 USD = 0.78 GBP
GERMANY	DE1100VP	Vorpommern North East Germany	334 hectares	conversion tillage – mulch seeding	1 USD = 0.89 EURO
FRANCE	FR230PICB	Picardy Hauts-de-France North France	51 hectares	tillage intensive tillage – prevailing conventional plowing or deep soil cultivation	1 USD = 0.89 EURO
CANADA	CA2000SAS	Saskatoon Saskatchewan Central Canada	972 hectares	no-tillage – direct seeding	1 USD = 1.33 CAD
AUSTRALIA	AU5500WA	Western Australia	1000 hectares	no-tillage – direct seeding	1 USD = 1.43 AUD

Typical Farm Rapeseed Yield, ton per hectare

Country	Typical Farm Yield (2016-2018)	National Average (2016-2018)
UK800CAM	~2.8	~3.5
DE1100VP	~3.0	~3.3
FR230PICB	~3.8	~3.3
CA2000SAS	~2.5	~2.3
AU4400WA	~1.5	~1.3

Price per ton (USD, 2019)

Country	Price per ton (USD, 2019)
UK800CAM	434
DE1100VP	423
FR230PICB	409
CA2000SAS	315
AU4400WA	392

Rapeseed – Facts and Figures

GM Technology in Rapeseed

In some parts of the world GM technology is very important in rapeseed: In Canada about 95% of the total acreage is planted to GM herbicide resistant varieties; in Australia, the respective share is about 25%. In total, GM rapeseed is produced on roughly 10 million ha which equals 29% of the global acreage. This figure has been mainly flat since 2012.

The GM technology applied is based on three genes for glufosinate, glyphosate, and oxynil tolerance. Furthermore, in the USA a trait to produce high lauric acid has been approved.

Winter versus spring rapeseed

In Europe, winter rapeseed is grown in three to four-year rotations with cereals such as wheat and barley. A rotation is needed to reduce the pressure from pests and diseases being carried over from one crop to another.

Spring rapeseed

is cultivated in Canada, USA and Northern Europe because the frost would regularly damage the small plants. Spring rapeseed does not require vernalization and is therefore also grown in Australia. The crop is sown in spring with stem development happening immediately after germination.

Top Exporters 2019 (in 1000 tons)

Canada	10.000
Ukraine	3.000
Australia	1.800
Russia	425

Top Importers 2019 (in 1000 tons)

EU	6.300
China	2.750
Japan	2.320
Mexico	1.250

Erucic Acid – Rapeseed 00 (double-zero rapeseed varieties)

Rapeseed contains two anti-nutritional factors: erucic acid and glucosinolates. While the former causes a health issue in human nutrition the latter causes problems when rapeseed meal – the by-product from oil extraction – is used as a feedstock.

In the 1970s scientists developed varieties with only minimal content of both components. Thereby, rapeseed could be used without any restrictions and hence, its consumption and production grew significantly globally.

Crop Rotation of Typical Farms

Country	Rotation	Crops
United Kingdom (UK800CAM)	4 YEARS ROTATION	WHEAT, RAPESEED, WHEAT, BEANS
	SEASON	☀️ ☀️ ☀️ ☀️
Germany (DE1100VP)	3 YEARS ROTATION	RAPESEED, WHEAT, BARLEY
	SEASON	☀️ ☀️ ☀️
France (FR230PICB)	5 YEARS ROTATION	SUGARBEET, WHEAT, RAPESEED, WHEAT, BARLEY
	SEASON	☀️ ☀️ ☀️ ☀️ ☀️
Canada (CA2000SAS)	3 YEARS ROTATION	RAPESEED, WHEAT, PEA +
	SEASON	☀️ ☀️ ☀️
Australia (AU5500WA)	4 YEARS ROTATION	WHEAT, LUPINS, WHEAT, RAPESEED
	SEASON	☀️ ☀️ ☀️ ☀️

PEA + PEAS (50%) + (in equal shares)

- LINSEED
- OATS
- MALTING BARLEY

Crop Calendar

Temperature monthly AVERAGE: highest 30°C, 17.5°C, 5°C, -7.5°C, lowest -20°C

Germany (DETAILS): (deg. SEP) FUNGICIDE BOR LIQUID, (mid APR) BITTERSALZ, (end APR) AHL

Annual Precipitation mm/year

☀️ = 25 mm

Country	Annual Precipitation (mm/year)
UK (UK800CAM)	570
GERMANY (DE1100VP)	590
FRANCE (FR230PICB)	650
CANADA (CA2000SAS)	350
AUSTRALIA (AU5500WA)	420

Land Prices and Rental Rates USD/HA, 2019

Country	Purchase price	Rental rate
United Kingdom (UK800CAM)	28.582	302
Germany (DE1100VP)	31.332	436
France (FR230PICB)	11.750	294
Canada (CA2000SAS)	4.318	150
Australia (AU5500WA)	1.133	49

Ownership Structure

Energy cost (USD/HA, 2019)

Labor cost USD/HA

Machinery Cost (USD/HA, 2019)

Direct Costs USD/ha, 2020

Country	Total Direct Cost (USD/ha)
UK (UK800CAM)	560
GERMANY (DE1100VP)	427
FRANCE (FR230PICB)	479
CANADA (CA2000SAS)	315
AUSTRALIA (AU5500WA)	178

Cost components: Seed, Nitrogen, Phosphorus, Potash, Herbicides, Fungicides, Insecticides