

Vegetable oil yields

Biodiesel yield = oil yield x 0.8 approx.

Note: These are conservative estimates -- crop yields can vary widely.

Ascending order				
Crop	kg oil/ha	litres oil/ha	lbs oil/acre	US gal/acre
corn (maize)	145	172	129	18
cashew nut	148	176	132	19
oats	183	217	163	23
lupine	195	232	175	25
kenaf	230	273	205	29
calendula	256	305	229	33
cotton	273	325	244	35
hemp	305	363	272	39
soybean	375	446	335	48
coffee	386	459	345	49
linseed (flax)	402	478	359	51
hazelnuts	405	482	362	51
euphorbia	440	524	393	56
pumpkin seed	449	534	401	57
coriander	450	536	402	57
mustard seed	481	572	430	61
camelina	490	583	438	62
sesame	585	696	522	74
safflower	655	779	585	83
rice	696	828	622	88
tung oil tree	790	940	705	100
sunflowers	800	952	714	102
cocoa (cacao)	863	1026	771	110
peanuts	890	1059	795	113
opium poppy	978	1163	873	124
rapeseed	1000	1190	893	127
olives	1019	1212	910	129
castor beans	1188	1413	1061	151
pecan nuts	1505	1791	1344	191

jojoba	1528	1818	1365	194
jatropha	1590	1892	1420	202
macadamia nuts	1887	2246	1685	240
brazil nuts	2010	2392	1795	255
avocado	2217	2638	1980	282
coconut	2260	2689	2018	287
oil palm	5000	5950	4465	635

Fuel properties of fats and oils

Fuel-related properties and iodine values of various fats and oils							
Oil or Fat	Iodine Value	CN	HG (kJ/kg)	Viscosity (mm²/s)	CP (deg C)	PP (deg C)	FP (deg C)
Babassu	10-18	38	-	-	-	-	-
Castor	82-88	?	39500	297 (38 C)	-	- 31.7	260
Coconut	6-12	-	-	-	-	-	-
Corn	103-140	37.6	39500	34.9 (38 C)	-1.1	- 40.0	277
Cottonseed	90-119	41.8	39468	33.5 (38 C)	1.7	- 15.0	234
Crambe	93	44.6	40482	53.6 (38 C)	10.0	- 12.2	274
Linseed	168-204	34.6	39307	27.2 (38 C)	1.7	- 15.0	241
Olive	75-94	-	-	-	-	-	-
Palm	35-61	42	-	-	-	-	-
Peanut	80-106	41.8	39782	39.6 (38 C)	12.8	-6.7	271
Rapeseed	94-120	37.6	39709	37.0 (38 C)	-3.9	- 31.7	246
Safflower	126-152	41.3	39519	31.3 (38 C)	18.3	-6.7	260
High-oleic safflower	90-100	49.1	39516	41.2 (38 C)	- 12.2	- 20.6	293
Sesame	104-120	40.2	39349	35.5 (38 C)	-3.9	-9.4	260

Soybean	117-143	37.9	39623	32.6 (38 C)	-3.9	- 12.2	254
Sunflower	110-143	37.1	39575	37.1 (38 C)	7.2	- 15.0	274
Tallow	35-48	-	40054	51.15 (40 C)	-	-	201
No. 2 DF	-	47	45343	2.7 (38 C)	- 15.0	- 33.0	52

CN = cetane number; CP = cloud point, PP = pour point, FP = flash point.

Comparison of properties of diesel, canola oil and commercial US biodiesel			
	Diesel	Canola Oil	Biodiesel
Density kgL ⁻¹ @ 15.5 deg C	0.84	0.92	0.88
Calorific value MJL ⁻¹	38.3	36.9	33-40
Viscosity mm ² s ⁻¹ @ 20 deg C	4-5	70	4-6
Viscosity mm ² s ⁻¹ @ 40 deg C	4-5	37	4-6
Viscosity mm ² s ⁻¹ @ 70 deg C	-	10	-
Cetane number	45	40-50	45-65

Bransby's site holds the one-year record at 15 tons per acre. Those are dry tons weighed after all the moisture's been baked out. Convert that into ethanol, an alcohol that can fuel vehicles, and it equals about 1,500 gallons per acre. Bransby's 6-year average, 11.5 tons a year, translates into about 11,500 gallons of ethanol per acre. An added bonus is the electricity that can be produced from the leftover portions of the crop that won't convert to ethanol.

National standards for biodiesel

Comparison of different national standards for biodiesel									
	Europe	Austria	Czech Republic	France	Germany	Italy	Sweden	USA	Australia
Standard / Specification	EN 14214	ON C1191	CSN 65 6507	Journal Officiel	DIN V 51606	UNI 10635	SS 155436	ASTM D-6751	Fuel Standard (Biodiesel) Determination
Date	2003	July 1997	Sep 1998	Sep 1997	Sep 1997	April 1997	Nov 1996	Jan 2002	Sept 2003
Application	FAME	FAME	RME	VOME	FAME	VOME	VOME	FAMAE	-
Density 15°C g/cm ³	0.86 - 0.90	0.85 - 0.89	0.87 - 0.89	0.87 - 0.90	0.875 - 0.90	0.86 - 0.90	0.87 - 0.90	-	860 to 890 kg/m ³
Viscos. 40°C mm ² /s	3.5-5.0	3.5-5.0	3.5-5.0	3.5-5.0	3.5-5.0	3.5-5.0	3.5-5.0	1.9-6.0	3.5-5.0
Distillat. 95% °C	-	-	-	<360	-	<360	-	90% @ 360°C	<360
Flashpoint °C	>120	>100	>110	>100	>110	>100	>100	>130 (150 av.)	>120
CFPP °C (cold filter plugging point)	*country specific	0/-15	-5	-	0/-10/-20	-	-5	-	-
Pour point °C	-	-	-	<-10	-	<0/ <-15	-	-	-
Sulfur % mass	<10 mg/kg	<0.02	<0.02	-	<0.01	<0.01	<0.001	<0.05	50 mg/kg (max) 10 mg/kg (max) (from 1 Feb 2006)
CCR 100% % mass	-	<0.05	<0.05	-	<0.05	-	-	-	-
10% dist. resid. % mass	<0.3	-	-	<0.3	-	<0.5	-	-	-
Sulfated ash % mass	<0.02	<0.02	<0.02	-	<0.03	-	-	<0.02	<0.02
(Oxid) Ash % mass	-	-	-	-	-	<0.01	<0.01	-	-
Water mg/kg	<500	-	<500	<200	<300	<700	<300	<0.05% vol. (water & sediment)	<0.05% vol (water & sediment)

Total contam. mg/kg	<24	-	<24	-	<20	-	<20	-	<24
Cu-Corros. 3h/50°C	1	-	1	-	1	-	-	<No.3	<10 mg/kg sulfur Class 1 (max) >10 mg/kg sulfur No. 3 (max)
Oxidation stability hrs;110°C	6 hours min	-	-	-	-	-	-	-	6 hours min
Cetane No.	>51	>49	>48	>49	>49	-	>48	>47	>51
Neutral. No. (Acid value) mgKOH/g	<0.5	<0.8	<0.5	<0.5	<0.5	<0.5	<0.6	<0.8	<0.8
Methanol % mass	<0.20	<0.20	-	<0.1	<0.3	<0.2	<0.2	-	<0.2
Ester content % mass	>96.5	-	-	>96.5	-	>98	>98	-	>96.5
Monoglyceride. % mass	<0.8	-	-	<0.8	<0.8	<0.8	<0.8	-	-
Diglyceride % mass	<0.2	-	-	<0.2	<0.4	<0.2	<0.1	-	-
Triglyceride % mass	<0.2	-	-	<0.2	<0.4	<0.1	<0.1	-	-
Free glycerol % mass	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02
Total glycerol % mass	<0.25	<0.24	<0.24	<0.25	<0.25	-	-	<0.24	<0.25
Iodine No.	<120	<120	-	<115	<115	-	<125	-	-
Linolenic acid ME %mass	<12	-	-	-	-	-	-	-	-
C18:3 and high. unsat.acids % mass	-	<15	-	-	-	-	-	-	-
C(x:4) & greater unsaturated esters % mass	<1	-	-	-	-	-	-	-	-
Phosphor mg/kg	<10	<20	<20	<10	<10	<10	<10	<0.001% mass	<10

Ramsbottom carbon residue, % mass	-	-	-	-	-	-	-	0.10	-
Carbon residue	-	-	-	-	-	-	-	<0.050% by mass	<0.30% mass (10% distillation residue) <0.050% mass (100% distillation sample)
Gp I metals (Na,K) mg/kg	<5	-	-	-	-	-	-	-	<5
Gp II metals (Ca,Mg) mg/kg	<5	-	-	-	-	-	-	-	<5
Alkalinity mg/kg	-	-	<10	<5	<5	-	<10	-	-

RME: Rapeseed oil methyl ester
 FAME: Fatty acid methyl ester
 VOME: Vegetable oil methyl ester
 FAMA: Fatty acid mono alkyl ester