

Appendix 4: Crop Production

1. Grains and legumes

Table 1.1: Barley

Country	Sweden, middle	Sweden	Denmark	Switzerland	Switzerland	Netherlands, Noordelijk kleigebied	Switzerland	Germany	USA, South Central Montana	USA, Eastern North Dakota
Source	Naturvårdsverket, 1997a,p. 105, also valid for oat	Carlsson-Kanyama, 1998, p. 38	Weidema, 1995, p. 107, 116, 119	FiBL 1998, p. 19	FiBL 1998, p. 19	Balk-Spruit/Spigt 1994, p. 100	FiBL 1998, p. 19	Dülmen, 1993, p. 87	Pimentel 1980, p. 60	Pimentel 1980, p. 61
Comment	Data for 1995	Ref. from 1996	Ref. from 1989, 1993 etc.	Winter barley,for wholesale conventional	Winter barley,for wholesale, integrated ¹	Winter barley	Winter barley,for wholesale, organic ²	Winter barley, low intensity	barley following fallow	barley following crop
Yield, kg/ha	4400	4 200	3310	6500	5500	6800	4000	5000	2330	1980
Diesel, l/ha	92	100	60	115	108	-	130	-	28	45
Gasoline, l/ha	-	-	-	-	-	-	0	-	36	32
N-applied, kg/ha	78	105	136	110	91	140	*	120	30	58
P-applied, kg/ha	18	20	25	24	15	20	*	18	16	33
K-applied, kg/ha	0	25	60	12	8	-	*	83	-	5
Pesticides, active substance kg/ha	-	-	-	-	-	8	0	-	1	1
Machinery, kg/ha	-	-	-	-	-	-	-	-	8	9
Limestone applied, kg/ha	-	-	-	-	-	-	0	-	-	-
Seeds, kg/ha	190	-	160	110	110	125	140	150	102	90

¹ Swiss integrated grain production: Fertilisers are so calculated, that they only cover 75% of fertilizer requirements; the rest 25% come from animal manure

² Swiss organic production: Fertilisers requirements are totally covered through animal manure

Table 1.2: Corn

Country	USA	France	USA	USA, Arkansas	USA, Texas	Switzerland	Switzerland	Switzerland
Source	Pimentel, 1996, Table 10.7	Cederberg, 1998, p. 32	Stout, 1990, p. 29	Windham, 1999, AG539	Pimentel 1980, p. 70	FiBL 1998, p. 23	FiBL 1998, p. 23	FiBL 1998, p. 23
Comment	ref. from 1990	ref. from 1997	ref. from 1978	ref. for 1999, irrigation	irrigated production	conventional ³	integrated ⁴	organic ⁵
Yield, kg/ha	7500	8200	5083	10083	7805	7500	7000	6500
Diesel, l/ha	75	112	206	225	118	79	86	151
Gasoline, l/ha	40	-	-	-	44	0	0	0
Electricity, MJ/ha	419	-	1239	-	1379	-	-	-
Natural gas m3/ha	-	-	-	-	2167	-	-	-
N-applied, kg/ha	152	180	125	233	121	91	66	0
P-applied, kg/ha	75	32	35	90	45	22	12	0
K-applied, kg/ha	96	66	67	118	5	19	12	0
Pesticides, active substance kg/ha	6	3	-	-	-	herbicide, once (ca. 2-5kg) wasps, once	herbicide, once (ca. 2-5kg) wasps, once*	wasps, once
Machinery, kg/ha	55	-	-	-	55	-	-	-
Limestone applied, kg/ha	426	-	-	-	-	0	0	0
Seeds, kg/ha	21	-	-	-	-	2 cans	2 cans	2 cans

³ Swiss conventional corn production: 20% of fertilizer requirements are covered by manure

⁴ Swiss integrated corn production: Fertilisers are so calculated, that they only cover 50% of fertilizer requirements; the rest 50% come from animal manure

⁵ Swiss organic corn production: Fertilisers requirements are totally covered through animal manure

1.3: Dry beans and peas

Country	USA	Sweden	Sweden	Sweden	Sweden	Netherlands, clay areas	Netherlands, sandy areas	Netherlands, clay areas Zuidwestelijk	Switzerland	Switzerland	Switzerland
Source	Pimentel, 1996, Table 10.18	Carlsson-Kanyama, 1998, p. 39	Naturvårdsverket, 1997a, p. 106	LiÖL, 1994, p. 113	Olsson, 1998, p. 7	Balk-Spruit/Spigt 1994, p. 110	Balk-Spruit/Spigt 1994, p. 110	Balk-Spruit/Spigt 1994, p. 110	FiBL 1998, p. 19	FiBL 1998, p. 19	FiBL 1998, p. 19
Comment	ref. from 1976 and from soybean data	fodder peas, ref. from 1996	Data for 1995, fodder peas	Brown beans	Brown beans	industry beans, field beans	industry beans, field beans	industry beans, field beans	conventional production ⁶ , field beans	integrated production ⁷ , field beans	organic production ⁸ , field beans
Yield, kg/ha	1457	3600	3200	2500	1600	5500	5500	2800	4000	3800	1800
Diesel, l/ha	76	100	111	231	180	-	-	-	98	84	108
Gasoline, l/ha	-	-	-	-	-	-	-	-	-	-	-
Electricity, MJ/ha	36	-	-	2160	-	-	-	-	-	-	-
N-applied, kg/ha	16	0	0	55	30	50	50	125	0	0	0
P-applied, kg/ha	18	10	20	50	30	59	42	59	24	22	0
K-applied, kg/ha	47	40	20	115	80	100	66	121	46	43	0
Pesticides, active substance kg/ha	5	-	-	-	-	2	3	12	herbicide, once insecticide, once-	herbicide, once	0
Machinery, kg/ha	20	-	-	-	-	-	-	-	-	-	-
Limestone applied, kg/ha	350	-	-	-	-	-	-	-	0	0	0
Seeds, kg/ha	60	285	240	120	-	150	150	150	175	175	190

⁶ no use of animal manure

⁷ no use of animal manure

⁸ Swiss organic production: fertilizer requirements covered with manure

1.4: Oat

Country	USA	Sweden	Switzerland	Switzerland	Switzerland	USA, Backlands Area of Texas
Source	Pimentel, 1996, Table 10.10	Carlsson-Kanyama, 1998, p. 39	FiBL 1998, p. 20	FiBL 1998, p. 20	FiBL 1998, p. 20	Pimentel 1980, p. 89
Comment	ref. from 1980	Ref. from 1996	conventional	integrated ⁹	organic ¹⁰	-
Yield, kg/ha	2870	3800	5500	5000	4000	2511
Diesel, l/ha	30	100	115	108	130	35
Gasoline, l/ha	20	-	-	-	0	26
Electricity, MJ/ha	-	-	-	-	-	-
N-applied, kg/ha	56	105	90	72	0	67
P-applied, kg/ha	26	20	21	14	0	67
K-applied, kg/ha	17	25	36	24	0	34
Pesticides, active substance kg/kg	0,6	-	-	-	0	1
Machinery, kg/ha	7,7	-	-	-	0	12
Limestone applied, kg/ha	-	-	-	-	0	-
Seeds, kg/ha	108	-	140	140	170	90

⁹ Swiss integrated grain production: Fertilisers are so calculated, that they only cover 75% of fertilizer requirements; the rest 25% come from animal manure

¹⁰ Swiss organic production: Fertilisers requirements are totally covered through animal manure

1.5: Peanuts

Country	USA, Georgia
Source	Pimentel, 1996, Table 10.21
Comment	ref. from 1980
Yield, kg/ha	3724
Diesel, l/ha	125
Gasoline, l/ha	63
Electricity, MJ/ha	172
N-applied, kg/ha	33
P-applied, kg/ha	69
K-applied, kg/ha	112
Pesticides, active substance kg/ha	53
Machinery, kg/ha	20
Limestone applied, kg/ha	1362
Seeds, kg/ha	127

1.6: Rape seed

Country	Sweden	Sweden	Sweden	Sweden	Sweden	Denmark	Sweden	Germany	Sweden	Sweden	Sweden	Switzerland	Switzerland	Switzerland
Source	Sonesson, 1993, p. 28, 30	Carlsson-Kanyama, 1998, p. 39	Carlsson-Kanyama, 1998, p. 39	Hoveliuss, 199, p. 7, Paper I	Hoveliuss, 199, p. 7, Paper II	Weidema, 1995, p. 107, 116, 119	Cederberg, 1998, p. 26	Cederberg, 1998, p. 26	SLU, 1996, p. 52	SLU, 1996, p. 52	Blix, Mattsson, 1998, p. 31	FiBL 1998, p. 22	FiBL 1998, p. 22	FiBL 1998, p. 22
Comment	Winter rape, treatment	Winter rape, ref. from 1996	Summer rape, ref. from 1996	Summer rape, ref. from 1998	Winter rape, data for 1998	ref.from 1989	Winter rape, ref. from 1997	Winter rape, northern Germany	Summer rape, P-AI class 3, ref. from 1995	winter rape, P-AI class 3, ref. from 1995	Winter rape. Ref. from 1997-1998	convention al ¹¹	integrated ¹²	organic ¹³
Yield, kg/ha	2800	2800	1900	1600	2769	2325	2470	3150	2000	3000	3000	3000	2700	2400
Diesel, l/ha	177	100	100	82	74	71	100	-	-	-	-	108	94	151
N-applied, kg/ha	189	180	120	126	140	155	160	200	90	110	170	117	95	0
P-applied, kg/ha	20	15	15	12	17	23	14	32	20	25	14	17	10	0
K-applied, kg/ha	32	35	35	23	30	97	28	114	20	30	26	21	12	0
Pesticides, active substance kg/ha	2	-	-	2	3	-	1	-	-	-	-	*	*	0
Machinery, kg/ha	19	-	-	-	-	-	-	-	-	-	-	-	-	-
Limestone applied, kg/ha	-	-	-	100	200	-	-	-	-	-	-	0	0	0
Seeds, kg/ha	12	-	-	8	7	5	-	-	-	-	-	550	550	550

¹¹ Swiss conventional rape seed production: 20% of fertilizer requirements are covered by manure

¹² Swiss integrated rape seed production: Fertilisers are so calculated, that they only cover 50% of fertilizer requirements; the rest 50% come from animal manure

¹³ Swiss organic rape seed production: Fertilisers requirements are totally covered through animal manure

1.7: Rice

Country	Japan	USA, California	USA	USA	USA, Arkansas	USA, California	USA, Mississippi river delta	USA, Gulf Coast	USA
Source	Pimentel, 1996, Table 10.12	Pimentel, 1996, Table 10.14	Carlsson-Kanayma, 1998, p. 40	Stout, 1990, p. 29	Livezey and McElroy, 1999, p. 20	Livezey and McElroy, 1999, p. 20	Livezey and McElroy, 1999, p. 20	Livezey and McElroy, 1999, p. 20	Livezey and McElroy, 1999, p. 20
Comment	ref. from 1961-1992	ref. from 1980	ref. from 1980, 1995	Ref. from 1978	Data for 1992	Data for 1992	Data for 1992	Data for 1992	Data for 1992, all farms
Yield, kg/ha	6330	6500	7000	5800	7137	10756	6882	6570	7362
Diesel, l/ha	90	225	190	908	424	241	385	351	370
Gasoline, l/ha	-	55	74	-	56	89	53	81	67
Electricity, MJ/ha	9	356	107	3200	21	44	19	9	20
Natural gas, m3/ha	-	-	-	-	13	0	6	156	51
N-applied, kg/ha	190	132	-	134	161	149	186	154	164
P-applied, kg/ha	90	56	-	0	12	49	7	48	26
K-applied, kg/ha	88	-	-	67	18	10	6	40	21
Pesticides, active substance kg/ha	11	16	-	-	-	-	-	-	-
Machinery, kg/ha	44	38	-	-	-	-	-	-	-
Limestone applied, kg/ha	-	-	-	-	-	-	-	-	-
Seeds, kg/ha	112	180	-	112	143	182	140	138	146

1.8: Rye

Country	Denmark	Sweden	Switzerland	Switzerland	Switzerland
Source	Weidema, 1994, p. 107, 116,	SLU, 1996, p. 36-37, 35, 363	FiBL 1998, p. 15	FiBL 1998, p. 15	FiBL 1998, p. 15
Comment	ref.from 1989	ref. from 1989, 1995	conventional	integrated ¹⁴	organic ¹⁵
Yield, kg/ha	3500	4000	6000	5500	4000
Diesel, l/ha	64	100	115	108	137
Gasoline, l/ha	-	-	0	0	0
Electricity, MJ/ha	-	-	-	-	-
Natural gas, m3/ha	-	-	-	-	-
N-applied, kg/ha	140	60	90	75	0
P-applied, kg/ha	20		22	15,4	0
K-applied, kg/ha	50	20	9	6	0
Pesticides, active substance kg/ha	-	-	herbicide 1x fungicide 1x growth regulator 1x	herbicide 1x	0
Machinery, kg/ha	-	-	-	-	-
Limestone applied, kg/ha	-	-	0	0	0
Seeds, kg/ha	85	150	140	140	170

¹⁴ Swiss integrated grain production: Fertilisers are so calculated, that they only cover 75% of fertilizer requirements; the rest 25% come from animal manure

¹⁵ Swiss organic production: Fertilisers requirements are totally covered through animal manure

1.9: Sorghum

Country	USA	USA, Arkansas	USA, Arkansas
Source	Pimentel, 1996, Table 10.16	Windham, 1999	Windham, 1999
Comment	Mainly data from 1974-1980	Non-irrigated sorghum, AG540	Irrigated sorghum, AG541
Yield, kg/ha	3031	4828	7185
Diesel, l/ha	135	79	170
Gasoline, l/ha	-	-	-
Electricity, MJ/ha	1591	-	-
N-applied, kg/ha	78	113	159
P-applied, kg/ha	31	77	77
K-applied, kg/ha	10	101	101
Pesticides, active substance kg/ha	6	-	-
Machinery, kg/ha	31	-	-
Limestone applied, kg/ha	30	-	-
Seeds, kg/ha	30	7	8

1.10: Soy beans

Country	USA	USA, Nebraska	Brasil	USA, Arkansas	USA, Arkansas	USA, Arkansas	USA, Arkansas	Brasil	Brasil	USA, Nebraska	Switzerland	Switzerland	Switzerland
Source	Pimentel, 1996. Table 10.17	Carlsson-Kanyama, 1998, p. 39	Cederberg, 1998, p. 26	Windham, 1999	Windham, 1999	Windham, 1999	Windham, 1999	Blix, Mattsson, 1998, p. 45-46	Blix, Mattsson, 1998, p. 45-46	Pimentel, 1980, p. 120	FiBL 1998, p. 21	FiBL 1998, p. 21	FiBL 1998, p. 21
Comment	ref. from 1976-1980	irrigated, ref. from 1997	Average, conventional	irrigated AG524	non irrigated AG523	irrigated AG521	non irrigated AG518	ref. from 1987-1998	ref. from 1987-1998	-	conventional ¹⁶	integrated ¹⁷	organic ¹⁸
Yield, kg/ha	1882	3 628	2200	3025	1680	3025	1680	2300	2300	2210	2700	2600	2300
Diesel, l/ha	7	297	60	145	38	280	52	-	-	54	79	72	101 (we are not so precise!)
Gasoline, l/ha	5	-	-	-	-	-	-	-	-	24	0	0	0
Electricity, MJ/ha	36	-	-	-	-	-	-	-	-	2038	-	-	-
N-applied, kg/ha	4	9,9	0	0	0	0	0	0	0	6	0	0	0
P-applied, kg/ha	18	25,7	17	0	33,6	33,6	30,24	17	35	4	17	15,8	0
K-applied, kg/ha	47	0	33	0	50,4	50,4	60,48	33	66	-	41	39	0
Pesticides, active substance kg/ha	5	-	1	-	-	-	-	-	-	-	herbicide 1x	herbicide 1x	-
Machinery, kg/ha	20	-	-	-	-	-	-	-	-	12	-	-	-
Limestone kg/ha	350	-	-	-	-	-	-	320	320	-	0	0	0
Seeds, kg/ha	60	-	-	-	60	50	45	-	-	-	110	110	120

¹⁶ no use of animal manure¹⁷ no use of animal manure¹⁸ Swiss organic production: fertilizer requirements covered with manure

1.11: Sunflower seed

Country	France	Argentina
Source	Cederberg, 1998, p. 32	Cederberg, 199, p. 32
Comment	ref. from 1997	ref. about diesel use from France, 1997
Yield, kg/ha	2100	1 640
Diesel, l/ha	120	100
Gasoline, l/ha	-	-
Electricity, MJ/ha	-	-
Natural gas, m3/ha	-	-
N-applied, kg/ha	150	-
P-applied, kg/ha	35	-
K-applied, kg/ha	215	-
Pesticides, active substance kg/ha	2	1
Machinery, kg/ha	-	-
Limestone applied, kg/ha	-	-
Seeds, kg/ha	-	-

1.12: Wheat

Country	USA, North Dakota	Sweden	Sweden	Sweden	Denmark	Netherlands	Switzerland	Switzerland	Switzerland	Switzerland	Germany	UK
Source	Pimentel, 1996, Table 10.9	Naturvårdsverket, 1997a, p. 105	Välilä, 1998, p. 91	Hovellius, 1999, p. 6, Paper I	Weidema et al, 1994, p. 107,116,119	Balk-Spruit/Spigt 1994, p. 96	Audsley et al.,1997, p. 6&appendix	FiBL 1998, p. 9	FiBL 1998, p. 9	FiBL 1998, p. 9	Dülmen 1993, p. 87	Audsley et al.,1997, p. 6&appendix
Comment	ref. from 1980	Data for 1995, winter wheat	Minimal tillage, winter wheat, data for 1997	Winter wheat, ref. from 1998	ref.from 1993	-	Winter wheat, integrated, ref.from 1996	Winter wheat, conventional farming	Winter wheat, integrated farming ¹⁹	Winter wheat, organic farming ²⁰	Winter wheat, low intensity	Winter wheat, intensive, ref. from 1995
Yield, kg/ha	1760	5600	7405	6300	6170	7900	6000	6500	5500	4000	6000	8000
Diesel, l/ha	46	107	101	82	79	-	105	115	108	137	-	125
Gasoline, l/ha	27	-	-	-	-	-	-	0	0	0	-	-
Electricity, MJ/ha	44	-	-	-	-	-	-	-	-	-	-	-
N-applied, kg/ha	46	122	163	126	180	200	132	140	119	0	160	240
P-applied, kg/ha	26	22	11	18	25	-	22	24	15	0	22	26
K-applied, kg/ha	7	0	38	34	60	-	10	11	7	0	100	50
Pesticides, active substance kg/ha	2	-	-	3	-	12	3	herbicide and growth regulator 1x, fungicide 2x	herbicide 1x	0	-	12
Machinery, kg/ha	19	19	-	-	-	-	-	-	-	-	-	-
Limestone applied, kg/ha	-	-	-	100	-	-	-	0	0	0	300	-
Seeds, kg/ha	104	190	-	205	190	165	160	180	180	200	175	185

¹⁹ Swiss integrated grain production: Fertilisers are so calculated, that they only cover 75% of fertilizer requirements; the rest 25% come from animal manure

²⁰ Swiss organic production: Fertilisers requirements are totally covered through animal manure

2. Fruit and vegetables

2.1: Apples

Country	USA, East coast	Sweden	New Zealand	France	Sweden	Sweden	USA, California	Switzerland	Switzerland	Switzerland
Source	Pimentel, 1996, Table 11.1	Stadig, 1997	Stadig, 1997	Stadig, 1997	LiÖL, 1996, p. 43	LiÖL, 1996, p. 47	Vossen et al, 1994	FiBL 1998, p. 35	FiBL 1998, p. 35	FiBL 1998, p. 35
Comment	ref. from 1980, data for one year	ref. from 1997, data for life-time of apple-orchard, 15 y	ref. from 1997, data for life-time of apple-orchard, 15 y	ref. from 1997, data for life-time of apple-orchard, 25 y	Summer apples, data for 1996, for one year	Winter apples, data for 1996, for one year	Data for 1994, no irrigation	integrated production, data for one year	organic production, data for one year	organic, tolerant variety, data for one year
Yield, kg/ha	54743	420004	920000	1545000	25000	27000	37050	32000	26000	22000
Diesel, l/ha	483	1567	5327	11034	407	407	514	439	569	482
Gasoline, l/ha	1346	222	1	0	-	-	266	0	0	0
Electricity, MJ/ha	239	13338	32400	75460	-	-	-	-	-	-
N-applied, kg/ha	45	557	1220	1583	50	50	112	55		
P-applied, kg/ha	114	131	0	424	20	20	-	12	0	0
K-applied, kg/ha	114	1407	0	304	80	80	-	50	50	50
Pesticides, active substance kg/ha	-	-	-	-	-	-	-	herbicide 1x fungicide 9x insecticide 3x	0	0
Machinery, kg/ha	88	-	-	-	-	-	-	-	-	-
Limestone applied, kg/ha	682	-	-	-	-	-	-	-	-	-
Plants, nu. / ha	-	1633	888	1426	1900	1900	499	-	-	-

2.2: Bananas

Country	Hawaii	Australia, New South Wales	Central Taiwan	Central Taiwan
Source	Pimentel, 1980, p. 292	Pimentel, 1980, p. 293	Pimentel, 1980, p. 294	Pimentel, 1980, p. 295
Comment		- 80 litres of oil for disease control not incl.	48 litres of oil for disease control not incl.	80 litres of oil for disease control not incl.
Yield, kg/ha	22000	18000	19000	33000
Diesel, l/ha	133	-	100	120
Gasoline, l/ha	55	540	30	40
Electricity, MJ/ha	-	1872	173	187
Natural gas, m3/ha	-	-	-	-
N-applied, kg/ha	270	250	352	495
P-applied, kg/ha	59	26	77	121
K-applied, kg/ha	448	457	584	747
Pesticides, active substance kg/ha	43	9	38	24
Machinery, kg/ha	83	53	99	99
Limestone applied, kg/ha	2550	1500	-	-
Plant rate, kg per ha	-	-	-	-

2.3: Beans, green

Country	Sweden	Netherlands, sandy areas	Netherlands, sandy areas	Schweiz
Source	LiÖL, 1994, p. 117	Balk-Spruit/Spigt 1994, p. 183	Balk-Spruit/Spigt 1994, p. 183	FiBL 1998, p. 13
Comment	irrigated crop	early with coverage	conventional	Beans for processing industry, integrated production
Yield, kg/ha	12000	8000	9500	8120
Diesel, l/ha	220	-	-	180
Gasoline , l/ha	-	-	-	-
Electricity , MJ/ha	2160	-	-	-
Natural gas, m3/ha	-	-	-	-
N-applied, kg/ha	60	100	50	15
P-applied, kg/ha	45	55	55	5
K-applied, kg/ha	120	166	166	37
Pesticides, active substance kg/ha	-	5	6	-
Machinery, kg/ha	-	-	-	-
Limestone applied, kg/ha	100	-	-	-
Seed rate, kg/ha	60	-	-	-

2.4: Broccoli

Country	Sweden
Source	LiÖL, 1994, p. 77
Comment	irrigated crop, planted
Yield, kg/ha	15000
Diesel , l/ha	847
Gasoline , l/ha	-
Electricity , MJ/ha	2160
Natural gas, m3/ha	-
N-applied, kg/ha	210
P-applied, kg/ha	55
K-applied, kg/ha	205
Pesticides, active substance kg/ha	-
Machinery, kg/ha	-
Limestone applied, kg/ha	100
Plants, numbers per ha	60000

2.5: Cabbage, chinese

Country	Sweden
Source	LiÖL, 1994, p. 93
Comment	irrigated crop, planted
Yield, kg/ha	45000
Diesel , l/ha	495
Gasoline , l/ha	-
Electricity, MJ/ha	2160
Natural gas, m3/ha	-
N-applied, kg/ha	180
P-applied, kg/ha	60
K-applied, kg/ha	190
Pesticides, active substance kg/ha	-
Machinery, kg/ha	-
Limestone applied, kg/ha	100
Plants, numbers per ha	60000

2.6: Cabbage, white

Country	Sweden
Source	LiÖL, 1994, p. 61
Comment	irrigated crop, harvest week 34-39
Yield, kg/ha	45000
Diesel , l/ha	484
Gasoline , l/ha	-
Electricity, MJ/ha	2160
Natural gas, m3/ha	-
N-applied, kg/ha	230
P-applied, kg/ha	65
K-applied, kg/ha	235
Pesticides, active substance kg/ha	-
Machinery, kg/ha	-
Limestone applied, kg/ha	-
Plants, numbers per ha	45000

2.7: Carrots

Country	Netherlands	Sweden	Sweden	Sweden	Netherlands	Switzerland	Switzerland	Switzerland
Source	Carlsson-Kanyama, 1997, p. 44 Appendix	LiÖL, 1994, p. 33	Mattson, 1999, p. 13-15, 19, 20	Mattson, 1999, p. 24, 27, 28,	Balk-Spruit/Spigt, 1994, p. 154	FiBL 1998, p. 24	FiBL 1998, p. 24	FiBL 1998, p. 24
Comment	ref. from 1996, fresh carrots	data for 1994	integrated farming for industrial purposes, data for 1995-1996	organic farming for industrial purposes, data for 1995-1996	early, with coverage	integrated, processing	integrated, storage	organic, processing
Yield, kg/ha	62000	40000	73400	55500	40000	55000	46200	50000
Diesel , l/ha	-	396	164	177	-	461	684	424
Gasoline , l/ha	-	-	-	-	-	-	-	-
Electricity, MJ/ha	-	2160	950	554	-	-	-	-
Propane, kg/ha	-	-	-	22	-	-	-	-
N-applied, kg/ha	100	100	31	198	30	153	153	60 ²¹
P-applied, kg/ha	52	45	20	16	55	9,9	9,9	0
K-applied, kg/ha	122	160	205	34	208	87,15	87,15	0
Pesticides, active substance kg/ha	-	-	2	0	1	7	-	0
Machinery, kg/ha	-	-	-	-	-	-	-	-
Limestone applied, kg/ha	-	-	600	-	-	-	-	-
Seeds, kg per ha	-	3	1	1	3	-	-	-

²¹ organic N fertilizer; plus animal manure / muck (12'000 kg)

2.8: Cucumber, open ground

Country	Sweden
Source	LiÖL, 1994, p. 121
Comment	data for 1994, irrigated crop
Yield, kg/ha	45000
Diesel , l/ha	341
Gasoline , l/ha	-
Electricity, MJ/ha	2160
Propane, kg/ha	-
N-applied, kg/ha	95
P-applied, kg/ha	55
K-applied, kg/ha	140
Pesticides, active substance kg/ha	-
Machinery, kg/ha	-
Limestone applied, kg/ha	100
Seeds, kg per ha	2

2.9: Cucumber, greenhouse

Country	Sweden	Sweden	Germany	Germany
Source	Trädgårdsutveckling, pers.comm., 1999	LiÖL, 1996, p. 17	Dülmen 1993, p. 567	Dülmen 1993, p. 567
Comment	Data for 1999	Data for 1996	Fertilizer quantity=nutrient intake of the plant	Fertilizer quantity=nutrient intake of the plant
Yield, kg/m ²	50	55	35	20
Diesel , l/m ²	-	-	-	-
Gasoline , l/m ²	-	-	-	-
Electricity, MJ/m ²	-	-	-	-
Energy for heating, MJ/m ²	2016	-	-	-
Oil for heating, l/m ²	-	48	-	-
Natural gas for heating, m ³ /m ²	-	-	-	-
N-applied, kg/m ²	-	-	480	300
P-applied, kg/m ²	-	-	130	75
K-applied, kg/m ²	-	-	760	490
Pesticides, active substance kg/ha	-	0	-	-
Machinery, kg/m ²	-	-	-	-
Limestone applied, kg/m ²	-	-	-	-
Plants, nu.per m ²	-	1	-	-

2.10: Cherries

Country	Sweden	Switzerland	USA, California
Source	LiÖL, 1996, p. 31	FiBL 1998, p. 36	Grant et al, 1999, Table 3
Comment	Ref. from 1996, data for one year	Table cherries (cherries to be eaten directly), hedge plantage, Integrated roduction, data for one year	data for 1999, one year , mature trees
Yield, kg/ha	10000	11000	12 125
Diesel , l/ha	539	677	288
Gasoline , l/ha	-	-	96
Electricity, MJ/ha	-	-	-
N-applied, kg/ha	-	45	112
P-applied, kg/ha	-	10	34
K-applied, kg/ha	-	50	152
Pesticides, active substance kg/ha	-	-	-
Machinery, kg/ha	-	-	-
Limestone applied, kg/ha	-	-	-
Plants, nu. per ha	700	-	331

2.11: Grapes

Country	USA, California	USA, California	Switzerland	USA, North-Coastal California	Switzerland
Source	Klonksy et al, 1997.	Klonsky et al, 1996	FAW, 1995, Nr. 46, p. 8,11	Pimentel 1980, p. 276	FiBL 1998, p. 40
Comment	Grapes for raisins, data for lifetime of orchard, 25 years	Grapes for wine, data for lifetime of orchard, 25 years	Standard fertilizing in yield plantage without correction on the basis of a soil analysis	older non-irrigated vineyards, one year production	High yield grapes, Blauburg (grape sort), IP
Yield, kg/ha	114251	227246	10000	11232	10000
Diesel , l/ha	7170	3347	-	508	468
Gasoline , l/ha	250	11670	-	-	-
Electricity, MJ/ha	-	-	-	-	-
Natural gas, m3/ha	-	-	-	-	-
N-applied, kg/ha	1325	163	80	160	54
P-applied, kg/ha	0	383	9	-	8
K-applied, kg/ha	0	0	42	-	62
Pesticides, active substance kg/ha	-	-	-	59	59
Machinery, kg/ha	-	-	-	-	-
Limestone applied, kg/ha	-	-	-	-	-
plant rate, nu. /ha	1282	1536	-	-	-

2.12: Lettuce, open ground

Country	Sweden	Netherlands	Netherlands	Netherlands	USA, California
Source	LiÖL, 1994, p. 101	Balk-Spruit/Spigt 1994, p. 160	Balk-Spruit/Spigt 1994, p. 161	Balk-Spruit/Spigt 1994, p. 165	Takele et al, 1996
Comment	irrigated crop, from plants, crisp-head lettuce	Head salad	Sommer, head salad	Fall, Lollo Rosso	data for 1996, loose leaf lettuce
Yield, kg/ha	25000	24850	29750	22500	54031
Diesel , l/ha	495	-	-	-	930
Gasoline , l/ha	-	-	-	-	-
Electricity, MJ/ha	2160	-	-	-	-
Natural gas, m3/ha	-	-	-	-	-
N-applied, kg/ha	75	120	0	-	170
P-applied, kg/ha	40	55	29	29	13
K-applied, kg/ha	120	166	83	83	0
Pesticides, active substance kg/ha	-	10	14	12	-
Machinery, kg/ha	-	-	-	-	-
Limestone applied, kg/ha	100	-	-	-	-
Plant/seed rate, nu. or kg per ha	60000	945	-	1200	25

2.13: Lettuce, greenhouse

Country	Sweden	Germany	Netherlands
Source	LiÖL, 1996, p. 35	Dülmen 1994, p. 567	Balk-Spruit/Spigt 1994, p. 194
Comment	Data for 1996, lettuce in pots	Greenhouse, no data on energy	cultivation with binding, crisphead lettuce
Yield, kg/m ²	9	3	3
Diesel, l/m ²	-	-	-
Gasoline, l/m ²	-	-	-
Electricity, MJ/m ²	-	-	-
Energy for heating, MJ/m ²	-	-	-
Oil for heating, l/m ² , year	25	-	-
Natural gas for heating, m ³ /m ²	-	-	-
N-applied, kg/m ²	-	0,0070	0,0070
P-applied, kg/m ²	-	0,0010	0,0077
K-applied, kg/m ²	-	0,0100	0,0224
Pesticides, active substance kg/m ²	0	-	0,0032
Machinery, kg/m ²	-	-	-
Limestone applied, kg/m ²	-	-	-
Seeds/plants, nu. per m ²	495	-	15

2.14: Onions, garden

Country	Sweden
Source	LiÖL, 1994, p. 45
Comment	irrigated crop
Yield, kg/ha	45000
Diesel , l/ha	550
Gasoline , l/ha	-
Electricity, MJ/ha	2160
Natural gas, m3/ha	-
N-applied, kg/ha	110
P-applied, kg/ha	60
K-applied, kg/ha	145
Pesticides, active substance kg/ha	-
Machinery, kg/ha	-
Limestone applied, kg/ha	-
Seed rate, kg per ha	6

2.15: Olives

Country	USA, California
Source	Vossen et al, 1999.
Comment	Data for life-time of olive orchard, 60 years
Yield, kg/ha	347774
Diesel , l/ha	3568
Gasoline , l/ha	11219
Electricity, MJ/ha	-
Natural gas, m3/ha	-
N-applied, kg/ha	2925
P-applied, kg/ha	0
K-applied, kg/ha	0
Pesticides, active substance kg/ha	-
Machinery, kg/ha	-
Limestone applied, kg/ha	-
Plant rate, st per ha	445

2.16: Oranges

Country	USA, Florida	USA	USA	USA, California
Source	Pimentel, 1996, Table 11.2	Pimentel 1980, p. 286	Pimentel 1980, p. 286	Takele et al, 1997
Comment	ref. from 1980, data for one year	data for one year, oranges for processing, irrigated crop	data for one year, oranges for processing, non-irrigated crop	data for one year, irrigated crop, Valencia oranges
Yield, kg/ha	40370	40370	30277	39295
Diesel , l/ha	90	401	96	67
Gasoline , l/ha	96	90	75	173
Electricity, MJ/ha	-	36	-	-
Natural gas, m3/ha	-	-	-	-
N-applied, kg/ha	225	225	196	112
P-applied, kg/ha	116	50	43	-
K-applied, kg/ha	225	187	163	-
Pesticides, active substance kg/ha	6	72	72	-
Machinery, kg/ha	24	42	16	-
Limestone applied, kg/ha	1288	1288	1120	-
Plants, no. per ha	-	-	-	299

2.17: Palm fruits

Country	Malaysia
Source	Blix and Mattson, 1998, p. 15, 56, 63
Comment	Trees>3 years, budget for one year
Yield, kg/ha	19100
Diesel , l/ha	-
Gasoline , l/ha	-
Electricity, MJ/ha	-
Natural gas, m3/ha	-
N-applied, kg/ha	115
P-applied, kg/ha	40
K-applied, kg/ha	272
Pesticides, active substance kg/ha	-
Machinery, kg/ha	-
Limestone applied, kg/ha	-
Plants, no. per ha	136

2.18: Parsley

Country	Sweden
Source	LiÖL, 1994, p. 109
Comment	irrigated crop
Yield, kg/ha	13000
Diesel , l/ha	209
Gasoline , l/ha	-
Electricity, MJ/ha	2160
Natural gas, m3/ha	-
N-applied, kg/ha	140
P-applied, kg/ha	40
K-applied, kg/ha	135
Pesticides, active substance kg/ha	-
Machinery, kg/ha	-
Limestone applied, kg/ha	100
Seeds, kg per ha	5

2.19: Peas, green

Country	Switzerland	Netherlands	Netherlands	Sweden
Source	LBL 1997, p. 15	Balk-Spruit/Spigt 1994, p. 108	Balk-Spruit/Spigt 1994, p. 108	Svenska Nestlé, Ulf Olofsson, pers. comm. 1999
Comment	Peas for processing	clay area, Zuidwestelijk (name of the area)	clay area, Centraal (name of the area)	data for 1999, yield in amount paid for by the processing industry
Yield, kg/ha	6510	4600	5200	4700
Diesel , l/ha	115	-	-	115
Gasoline , l/ha	-	-	-	7
Electricity, MJ/ha	-	-	-	-
Natural gas, m3/ha	-	-	-	-
N-applied, kg/ha	30	-	-	0
P-applied, kg/ha	9	59	59	5
K-applied, kg/ha	50	100	100	34
Pesticides, active substance kg/ha	-	6	8	1
Machinery, kg/ha	-	-	-	-
Limestone applied, kg/ha	-	-	-	-
Seeds, kg per ha	-	180	180	240

2.20: Potatoes

Country	USA, New York State	UK	Sweden	Sweden	Sweden	Sweden	Switzerland	Denmark	Switzerland	Switzerland	Switzerland
Source	Pimentel, 1996, Table 11.3	Pimentel, 1996, Table 11.4	LiÖl, 1994, p. 13	SLU, 1996, p. 80-81	LiÖl, 1994, p. 17	Börjesson, 1994	Jolliet, 1994, p. 29	Weidema, 1995, p. 107, 116,	Zehnder 1993, p. 58, 65	FiBL 1998. p. 31	FiBL 1998. p. 31
Comment	Ref. from 1976-1977	Ref. from 1976	Early summer potatoes	ref. from 1995, P-AI- classIII	Atumn/winter potatoes		ref. from 1992	ref. from 1989, 1993	Aarau, 1993. Conventional.	conventional ²²	integrated ²³
Yield, kg/ha	34384	26300	20000	30000	38000	38350	45000	35600	45000	38000 ²⁴	36000 ²⁵
Diesel,, l/ha	152	173	275	-	352	371	236	166	290	360	353
Gasoline,, l/ha	272	-	-	-	-	-	-	-	-	-	-
Electricity, MJ/ha	47	-	1440	-	2160	-	-	-	-	-	-
N-applied, kg/ha	205	175	120	90	140	144	100	140	110	93	66
P-applied, kg/ha	348	175	35	60	65	43	48	30	110	24,2	14,08
K-applied, kg/ha	198	250	110	120	180	144	215	125	300	161,85	95,45
Pesticides, active substance kg/ha	55	13	4	-	-	-	-	-	4	-	-
Machinery, kg/ha	31	-	-	-	-	-	72	-	-	-	-
Limestone applied, kg/ha	-	-	-	-	-	360	-	-	-	-	-
Seed rate, kg per ha	1900	-	2800	-	2800	2750	-	2000	2500	2520	2520

²² Swiss conventional production, Root crops: 20% of fertilizer requirements are covered by manure

²³ Swiss integrated production, Root crops: Fertilisers are so calculated, that they only cover 50% of fertilizer requirements; the rest 50% come from animal manure

²⁴ includes 95'000 kg "Erleseabgang"

²⁵ includes 90'000 kg "Erleseabgang"

2.21: Strawberries, open ground

Country	Sweden	Sweden	Switzerland	USA
Source	LiÖL, 1996, p.11	LiÖL, 1996, p.15	FiBL 1998, p. 38	Pimentel 1980, p. 298
Comment	data for 1996, picking by grower	data for 1996, picking by customer	integrated production	-
Yield, kg/ha	12000	9000	17000	23538
Diesel, l/ha	462	462	648	-
Gasoline , l/ha	-	-	-	786
Electricity, MJ/ha	7200	7200	-	11117
Natural gas, m3/ha	-	-	-	-
N-applied, kg/ha	55	55	60	224
P-applied, kg/ha	25	25	-	56
K-applied, kg/ha	90	90	-	185
Pesticides, active substance kg/ha	-	-	-	297
Machinery, kg/ha	-	-	-	38
Limestone applied, kg/ha	-	-	-	2621
Plants, nu. per ha	10000	10000	31250	59304

2.22: Strawberries, greenhouse

Country	Sweden
Source	LiÖL, 1996, p. 43
Comment	Data for 1996
Yield, kg/m2	7
Diesel , l/m2	-
Gasoline , l/m2	-
Electricity, MJ/m2	-
Energy for heating, MJ/m2	-
Oil for heating, l/m2	50
Natural gas for heating, m3/m2	0
N-applied, kg/m2	-
P-applied, kg/m2	-
K-applied, kg/m2	-
Pesticides, active substance kg/m2	0
Machinery, kg/m2	-
Limestone applied, kg/m2	-
Plants, nu. per m2	8

2.23: Sweet Pepper, greenhouse

Country	Sweden
Source	LiÖL, 1996, p. 23
Comment	Data for 1996
Yield, kg/m ²	18
Diesel , l/m ²	-
Gasoline , l/m ²	-
Electricity, MJ/m ²	-
Energy for heating, MJ/m ²	-
Oil for heating, l/m ²	60
Natural gas for heating, m ³ /m ²	-
N-applied, kg/m ²	-
P-applied, kg/m ²	-
K-applied, kg/m ²	-
Pesticides, active substance kg/m ²	0
Machinery, kg/m ²	-
Limestone applied, kg/m ²	-
Plants, nu.per m ²	3

2.24: Red Beets

Country	Sweden
Source	LiÖL, 1994, p. 25
Comment	irrigated crop
Yield, kg/ha	40000
Diesel , l/ha	385
Gasoline , l/ha	-
Electricity, MJ/ha	2160
Natural gas, m3/ha	-
N-applied, kg/ha	170
P-applied, kg/ha	60
K-applied, kg/ha	205
Pesticides, active substance kg/ha	-
Machinery, kg/ha	-
Limestone applied, kg/ha	100
Seeds, kg /ha	19

2.25: Sugar beets

Country	Sweden, south	Sweden	Sweden	Denmark	UK	Sweden	Switzerland	Switzerland	Switzerland
Source	Börjesson, 1994, p. 23, 25,	SLU, 1996, p. 63	SBA, 1995, p. 20-22	Weidema, 1995, p. 107, 116,	Pimentel, 1996, Table 11.8	Danisco Sugar, 1999, Robert Olsson pers. comm.	Zehnder 1993, p. 59, 64	FiBL 1998, p. 29	FiBL 1998, p. 29
Comment		P-AI- class III		Ref. from 1993, 1989	Ref. from 1976	P and K not only for sugar beets, 17,38 % sugar contents	conventional	conventional ²⁶	integrated ²⁷
Yield, kg/ha	45000	45600	45000	45600	35500	43800	60000	65000	58500
Diesel , l/ha	345	-	-	117	-	165	172	315	308
Gasoline , l/ha	-	-	-	-	-	0	-	-	-
Electricity, MJ/ha	-	-	-	-	-	0	-	-	-
Natural gas, m3/ha	-	-	-	-	-	0	-	-	-
N-applied, kg/ha	123	120	-	120	160	123	120	86	68
P-applied, kg/ha	21	25	50	35	50	38	40	18	10
K-applied, kg/ha	42	40	70	50	150	79	249	22	12
Pesticides, active substance kg/ha	1	-	-	-	11	3	6	herbicide 3x insecticide 1x	herbicide 1x
Machinery, kg/ha	-	-	-	-	-	-	-	-	-
Limestone applied, kg/ha	360	-	-	-	-	-	-	-	-
Seeds, kg per ha	-	-	-	-	-	1	10	-	-

²⁶ Swiss conventional production, Root crops: 20% of fertilizer requirements are covered by manure

²⁷ Swiss integrated production, Root crops: Fertilisers are so calculated, that they only cover 50% of fertilizer requirements; the rest 50% come from animal manure

2.26: Squash, open ground

Country	Sweden
Source	LiÖL, 1994, p. 125
Comment	irrigated crop
Yield, kg/ha	35000
Diesel, l/ha	308
Gasoline, l/ha	-
Electricity, MJ/ha	2160
Natural gas, m3/ha	-
N-applied, kg/ha	95
P-applied, kg/ha	50
K-applied, kg/ha	150
Pesticides, active substance kg/ha	-
Machinery, kg/ha	-
Limestone applied, kg/ha	100
Seeds, kg per ha	4

2.27: Tomatoes, open ground

Country	USA, California	USA, California	Spain	USA, California
Source	Pimentel, 1996, Table 11.6	Miyao et al, 1997, Table 2	Econet, 1995, Table 5	Klonsky et al, 1994, Table 2
Comment	ref. from 1973-1976	data for 1997, processing tomatoes, Yolo county	Pesticide use not incl. products for soil treatment	data for 1993-1994, processing tomatoes, organic
Yield, kg/ha	49616	80352	130000	70308
Diesel , l/ha	246	929	-	663
Gasoline , l/ha	628	18	-	7
Electricity, MJ/ha	837	-	-	-
Propane, m3/ha	-	-	-	47
N-applied, kg/ha	168	212	2462	-
P-applied, kg/ha	56	180	996	-
K-applied, kg/ha	96	0	2744	-
Pesticides, active substance kg/ha	31	-	17	-
Machinery, kg/ha	30	-	-	-
Limestone applied, kg/ha	50	-	-	-
Seeds, kg or nu. per ha	4	64350	-	148200

2.28: Tomatoes, greenhouse

Country	Sweden	Netherlands	Denmark	Sweden	Sweden	Sweden
Source	Carlsson-Kanyama, 1997, p. 45-46 Appendix	Econet, 1995, Table 5	Econet, 1995, Table 5	Trädgårdsutveckling, pers.comm., 1999	LiÖL, 1996, p. 11	Lagerberg and Brown, 1999, p. 12
Comment	ref. from 1996	-	-	Data for 1999	Data for 1996	Data for 1996
Yield, kg/m ²	40	50	45	42	40	42
Oil for heating, MJ/m ²	-	-	-	-	-	1700
Propane (heating+CO ₂ fertilisation), MJ/m ²	-	-	-	-	-	356
Electricity, MJ/m ²	-	-	-	-	-	70
Energy for heating, MJ/m ²	2016	-	-	2016	-	-
Oil for heating, l/m ²	-	-	-	-	55	-
Natural gas for heating, m ³ /m ²	-	60	73,3	-	-	0
N-applied, kg/m ²	0,2	0,1149	0,168	-	-	0,191
P-applied, kg/m ²	0,036	0,0254	0,11	-	-	0,070
K-applied, kg/m ²	0,26	0,1635	0,32	-	-	0,246
Pesticides, active substance kg/m ²	-	0,0005	0,0003	-	0	0
Machinery, kg/m ²	-	-	-	-	-	-
Limestone applied, kg/m ²	-	-	-	-	-	0,009
Plants, nu. per m ²	-	-	-	-	2,5	-

3. Forage crops etc.

3.1: Beets, fodder

Country	Switzerland	Netherlands	Switzerland	Switzerland	Switzerland
Source	Zehnder 1993, p. 59	Balk-Spruit/Spigt 1994, p. 134	FiBL 1998, p. 30	FiBL 1998, p. 30	FiBL 1998, p. 30
Comment	TS-Gehalt von Futterrüben: 9-19% (je nach Sorte. Quelle Wirz 1997)	Holland, clay area, Zeekleigebied	conventional production ²⁸	integrated production ²⁹	organic production ³⁰
Yield, kg DM/ha	16000	20000	14900	13500	11000
Diesel , l/ha	205	-	317	317	137
Gasoline , l/ha	-	-	-	-	-
Electricity, MJ/ha	-	-	-	-	-
N-applied, kg/ha	120	200	78	49	49
P-applied, kg/ha	115	42	26	15	15
K-applied, kg/ha	300	100	74	42	42
Pesticides, active substance kg/ha	4	9	-	-	0
Machinery, kg/ha	-	-	-	-	-
Limestone applied, kg/ha	-	-	-	-	-
Seeds, kg per ha	10	3	-	-	-

²⁸ Swiss conventional production, root crops: 20% of fertilizer requirements are covered by manure

²⁹ Swiss integrated production, Root crops: Fertilisers are so calculated, that they only cover 50% of fertilizer requirements; the rest 50% come from animal manure

³⁰ Swiss organic production, Root crops: 100% of fertilizer requirements are covered by manure

3.2: Hey and other fodder crops

Country	Sweden	Denmark	Denmark	Sweden	Sweden	USA, Ohio	USA	Switzerland	Switzerland	Switzerland	Switzerland
Source	Naturvårdsverket, 1997, p. 106	Weidema, 1995, p. 107, 116	Weidema, 1995, p. 107, 116	SLU, 1996, p. 94, 98-99	SLU, 1996, p. 94, 98-99	Pimentel, 1996, Table 11.10	Pimentel, 1996, Table 11.11	Zehnder 1993, p. 58	FiBL 1998, p. 41	FiBL 1998, p. 41	FiBL 1998, p. 41
Comment	data for 1995	grass, ref. from 1993, 1989	alfalfa, ref. from 1993, 1989	grass, two harvests/year, P-A1 class III	mixed ley, 2-3 harvests/year, P-A1 class III	alfalfa, ref. from 1977-1980	tame hay. Ref. from 1976-1980	3 harvest/year, grass ley	Natural meadow intensiv, hay selling, conventional	Natural meadow intensiv, hay selling, integrated	Seed pasture intensiv, hay selling, integrated
Yield, kg DM/ha	6600	4910	7123	7000	7000	6832	5000	10000	9997	9997	12000
Diesel , l/ha	108	44	44	-	-	-	36	20	173	173	281
Gasoline , l/ha	-	-	-	-	-	129	-	7	0	0	0
Electricity, MJ/ha	-	-	-	-	-	93,6	-	-	-	-	-
N-applied, kg/ha	145	300	0	160	90	7	7	120	77	48	93
P-applied, kg/ha	20	40	40	13	13	45	8	35	20	10	24
K-applied, kg/ha	50	200	250	95	95	59	16	199	113	56	136
Pesticides, active substance kg/ha	0	-	-	-	-	0,6	1	-	-	-	-
Machinery, kg/ha	-	-	-	-	-	20	20	-	-	-	-
Limestone applied, kg/ha	-	-	-	-	-	179	15	-	0	0	0
Seeds, kg /ha	7	25	14	20	21	4,5	30	-	-	-	33

3.3: Corn silage

Country	USA	Switzerland	Switzerland	Switzerland	Switzerland
Source	Pimentel, 1996, Table 11.12	Zehnder 1993, p. 60,65	FiBL 1998, p. 28	FiBL 1998, p. 28	FiBL 1998, p. 28
Comment	Corn silage. Ref. from 1976-1980	Corn silage, whole plant	conventional ³¹	integrated ³²	organic ³³
Yield, kg DM/ha	9306	16000	13200	13200	10600
Diesel , l/ha	110	166	288	288	331
Gasoline , l/ha	105	-	-	-	-
Electricity, MJ/ha	43	-	-	-	-
N-applied, kg/ha	116	130	80	50	0
P-applied, kg/ha	66	44	27	17	0
K-applied, kg/ha	75	216	124	77	0
Pesticides, active substance kg/ha	5	6	herbicide 1x	herbicide 1x	0
Machinery, kg/ha	40	-	-	-	-
Limestone applied, kg/ha	560	-	0	0	0
Seeds, kg /ha	19	40	2.2 cans	2.2 cans	2.2 cans

³¹ Swiss conventional production, root crops: 20% of fertilizer requirements are covered by manure

³² Swiss integrated production, Root crops: Fertilisers are so calculated, that they only cover 50% of fertilizer requirements; the rest 50% come from animal manure

³³ Swiss organic production, Root crops: 100% of fertilizer requirements are covered by manure

3.4: Pasture on arable land

Country	Sweden	Sweden	Sweden	Switzerland
Source	Naturvårdsverket, 1997a, p. 107	Cederberg, 1998, p. 42	Cederberg, 1998, p. 48	FiBL 1998, p. 36
Comment	data for 1995	data for 1997, conventional production	data for 1997, organic production	conventional, extensiv
Yield, kg DM/ha	4600	4800	3150	2500
Diesel , l/ha	50	30	23	58
Gasoline , l/ha	-	-	-	-
Electricity, MJ/ha	-	-	-	-
N-applied, kg/ha	160	24,14	-	0
P-applied, kg/ha	11	-	-	0
K-applied, kg/ha	0	-	-	0
Pesticides, active substance kg/ha	0	-	-	0
Machinery, kg/ha	-	-	-	-
Limestone applied, kg/ha	-	-	-	0
Seeds, kg per ha	3	-	-	25

3.5: Pasture, cutover

Country	Sweden
Source	Naturvårdsverket, 1997a, p. 107
Comment	data for 1995
Yield, kg DM/ha	1600
Diesel , l/ha	50
Gasoline , l/ha	-
Electricity, MJ/ha	-
N-applied, kg/ha	-
P-applied, kg/ha	-
K-applied, kg/ha	-
Pesticides, active substance kg/ha	0
Machinery, kg/ha	-
Limestone applied, kg/ha	-
Seeds, kg per ha	-

3.6: Sugar cane

Country	USA, Louisiana	Brasil
Source	Pimentel, 1996, Table 18.9	Pimentel, 1996, Table 18.11
Comment	Ref. from 1980	Ref. from 1978, 1983
Yield, kg/ha	88000	54000
Diesel , l/ha	284	262
Gasoline, l/ha	54	-
Electricity , MJ/ha	-	-
N-applied, kg/ha	158	65
P-applied, kg/ha	97	52
K-applied, kg/ha	149	100
Pesticides, active substance kg/ha	9	4
Machinery, kg/ha	72	72
Limestone applied, kg/ha	1120	616
Seeds, kg per ha	215	215