

Appendix 10: Farm inputs

Table 1: Energy use for N-fertilisers

N-fertiliser	Country	Source	Comment	Energy, MJ, not incl. conversion losses or production and delivery energy	Energy, MJ/kg N, incl. conversion losses and production and delivery energy
Ammonium nitrate, 27,5 %N	Europe	Audesley, 1997, p. 31	Ref. from 1992, 1994. Inherent, production and delivery energy	-	46
Ammonium nitrate, 34,5 %N	Europe	Audesley, 1997, p. 31	Ref. from 1992, 1994. Inherent, production and delivery energy	-	44
Ammonium sulphate	Europe	Audesley, 1997, p. 31	Ref. from 1992, 1994. Inherent, production and delivery energy	-	45
Urea	Europe	Audesley, 1997, p. 31	Ref. from 1992, 1994. Inherent, production and delivery energy	-	63
N-Fertilisers		- Ceuterick 1996, p. 217	diverse references: 45 MJ/kg N (Ifeu, 1991) to 80 MJ/kg N (Studer et al. 1992)	45-80	-
Ammonia synthesis		- Diepenbrock, 1995, p. 18	Ref. BASF 1991	34	-
Calcium-Ammonium-Nitrate		- Diepenbrock, 1995, p. 18	Ref. BASF 1991	30	-
Ammonia synthesis		- Bockmann, 1990, p. 170	modern factories	35	-
Urea		- Bockmann, 1990, p. 170	modern factories	42	-
Ammonium nitrate, 27,5 %N		- Bockmann, 1990, p. 170	modern factories	35	-
Average N-fertiliser, 28.6% N-content, country of origin west/east Europe		- Patyk 1997, p. 88	Average of different fertilisers	42	-
N-Fertilisers	Sweden	Uhlin, 1999, p. 71	data for 1993	-	40

Table 2: Energy use for transportation of N-fertilisers

N-fertiliser	Country	Source	Comment	Energy, MJ, not incl. conversion losses or production and delivery energy	Energy, MJ/kg N, incl. conversion losses and production and delivery energy
N-fertiliser	-	von Oheimb 1987 in Diepenbrock 1995, p. 18	Transport and storage	4,1	-
average N-fertiliser, 28.6% N-content, country of origin west/east Europe	-	Patyk 1997, p. 88	transport (import), average of in BRD currently used N-fertilisers	-	2,8

Table 3: Energy use for P-fertilisers

P-fertiliser	Country	Source	Comment	Energy, MJ, not incl. conversion losses or production and delivery energy	Energy, MJ/kg N, incl. conversion losses and production and delivery energy
Thomas meal	Europe	Audesley, 1997, p. 32	Ref. from 1992. Inherent, production and delivery energy	-	9,6
Triple super phosphate	Europe	Audesley, 1997, p. 32	Ref. from 1992. Inherent, production and delivery energy	-	29
different P-Fertilizers	-	Bockman 1990, p.170		27-43	-
Hyperphosphat	-	Diepenbrock 1995, after Mudahar and Hignett 1987a	!!!!	4,8	-
Triple phosphate	-	Diepenbrock 1995	-	20	-
Superphosphate	-	Diepenbrock 1995	-	20	-
Non defined P-fertiliser	-	von Oheimb 1987 in Diepenbrock 1995, p. 22 (without transportation and storage (9 MJ/kg))	-	16	-
Non defined P-fertiliser	-	Reinhardt 1993 in Diepenbrock 1995, p. 19	-	32	-
Non defined P-fertiliser	-	Diepenbrock 1995, p.20	-	41	-
Non defined P-fertiliser	-	Ceuterick 1996, p. 18	-	28	-
average P-fertiliser	-	Patyk 1997, p. 169	-	20	30
P-Fertilisers	Sweden	Uhlin, 1999, p. 71	data for 1993	-	39

Table 4: Energy use for transportation of P-fertilisers

P-fertiliser	Country	Source	Comment	Energy, MJ/kg N, incl. conversion losses and production and delivery energy
Non defined P-fertiliser	-	von Oheimb 1987 in Diepenbrock 1995, p. 22	transportation and storage	9
average P-fertilizer	-	Patyk 1997, p. 169	P2O5 content 32.2%, transport (import)	11

Table 5: Energy use for K-fertilisers

K-fertiliser	Country	Source	Comment	Energy, MJ, not incl. conversion losses or production and delivery energy	Energy, MJ/kg N, incl. conversion losses and production and delivery energy
K-fertiliser		- von Oheimb 1987 in Diepenbrock 1995, p. 20	-	7,2	-
K-fertiliser		- Reinhardt 1993 in Diepenbrock 1995, p. 20	-	9,6	-
K-fertiliser		- Studer 1992 Ceuterick 1996, p. 219	-	9,6	-
average K-fertiliser		- Patyk 1997, p. 122	-	10	12
K-fertiliser	Europe	Audesley, 1997, p. 32	ref. from 1990	-	5
K-fertilisers	Sweden	Uhlin, 1999, p. 71	data for 1993	-	12

Table 6: Energy use for transportation of K-fertilisers

K-fertiliser	Country	Source	Comment	Energy, MJ/kg N, incl. conversion losses and production and delivery energy
average K-fertiliser	-	Patyk 1997, p. 171	transport (import)	0,67

Table 7: Energy use for lime

Ca-fertiliser	Country	Source	Comment	Energy, MJ/kg N, incl. conversion losses and production and delivery energy
CaO	-	von Oheimb 1987 in Diepenbrock 1995, p. 20	author regards value as low	1,4
CaO	-	Reinhardt 1993 in Diepenbrock 1995, p. 20	mining, transport, grinding, packing of lime	3,1
limestone (54.3% CaO)	-	Patyk 1997, p. 127	-	0,39
quicklime (97% CaO)	-	Patyk 1997, p. 127	-	4,7
average K-Fertiliser	-	Patyk 1997, p. 127	average of the fertilisers used in Germany	1,0
lime	Sweden	Uhlin, 1999, p. 71	data for 1993	0,94

