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Biochar

criteria and use in organic farming

The ecoregion Kaindorf

ÖkoregionKaindorf

- ★ **founded in 2007 (IPCC report)**
- ★ **6 small communities - one vision**
- ★ **to get CO2-neutral by 2020**
- ★ **7 different working groups - 100 volunteers**
- ★ **more than 300 projects have been implemented**
- ★ **the most important one is our humus project**

The ecoregion Kaindorf

ÖkoregionKaindorf

- ★ increasing humus content from 3% to 7%
- ★ no more soil runoff
- ★ simplified tillage
- ★ no more pesticides are necessary
- ★ no more chemical fertilizers are necessary
- ★ all soil parameters are optimal

what happens after 5 years

The ecoregion Kaindorf

ÖkoregionKaindorf

- ★ **we try to find a solution for <u>every</u> farmer**
- ★ **calculate the costs for carbon increasing (30€/to)**
- ★ **develop a new carbon credit system**

we created a carbon credit system

Modification of soil structure by increasing carbon

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Terra Preta - the most fertil soil in the world

ÖkoregionKaindorf

The ecoregion Kaindorf

ÖkoregionKaindorf

- stable humus has an C/N ratio of 10
- you need 2.000 kg of nitrogen/ha for 1% humus
- our biggest problem in organic farming are the losses of nitrogen
- biochar could help to fix it and it would be possible to develop very fertile soils

carbon increasing in soils is possible in huge amounts

The ecoregion Kaindorf

ÖkoregionKaindorf

- reducing nitrogen losses
- reducing odor in manure and animal houses
- reducing nitrogen and carbon losses during the composting process
- more healthy animals by feeding biochar
- fixing effect for every toxins and pollutants
- works perfect against diarrhea

benefits of using biochar in organic farming

What is biochar:

ÖkoregionKaindorf

Red Colobus Monkeys eating charcoal and poisonous fruits

What is biochar:

ÖkoregionKaindorf

https://pacificbiochar.com/definition-of-biochar/

benefits of using biochar in organic farming

What is biochar:

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- endproduct of pyrolysis process (heating up to 400-800°C without oxygen
- according to EBC - a product witch is produced very environmentally friendly from a very clean feedstock from a sustainable production
- very low content of heavy metal, dioxins, furans and PAH
- carbon content higher than 50%

biochar - an absolutely organic and natural stuff

Problem of biochar for organic farming:

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- its not on the positiv list for allowed amendments in organic farming (Annex I of the Reg. 889/2008) - this is completely incomprehensible in praxis

- because: its allowed as a home remedies for medical treatment of pets

- its allowed to use it on cheese (E 153)

- its allowed to use self made biochar - also from gasification process (with very high PAH-contents)

biochar - an absolutely organic and natural stuff

FeedChar

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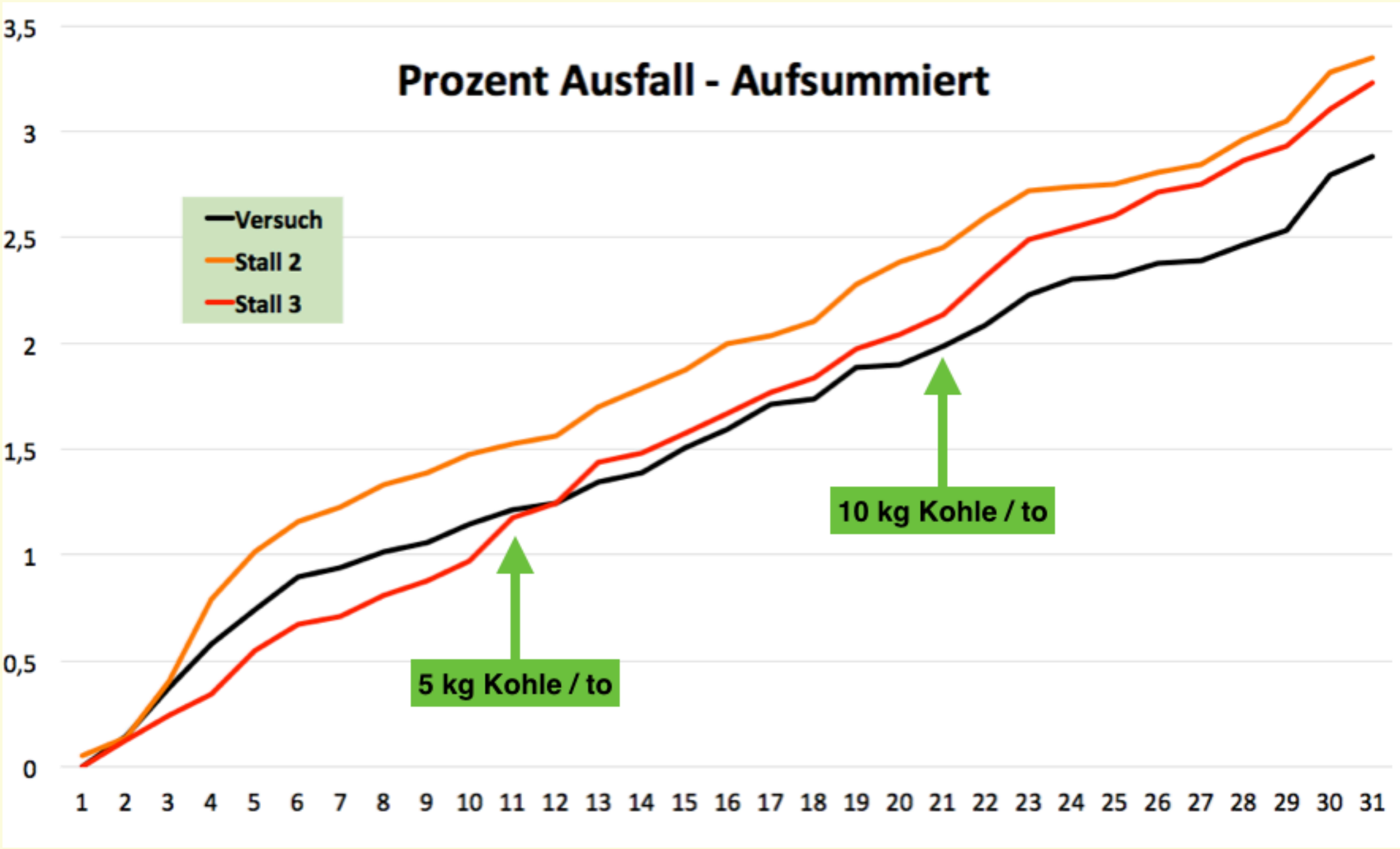

Die beste Erde unter der Sonne

Pflanzenkohle24.de

Das Verkaufsportal der EGoS Gruppe

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+49 (0) 2045 - 46 98 46
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+49 (0) 2045 - 46 98 47
office@egosgroup.de
www.egosgroup.de

Angebote

Pflanzenkohle Premium Plus300/0-5mm 1800 Liter bioaktiv,...

UVP399,00 EUR
Nur 379,05 EUR
0,21 EUR pro Liter

Rinder-Futterkohle PremiumPlus 1000 Liter/ca.300Kg

UVP439,00 EUR
Nur 395,10 EUR

Schweine-Futterkohle PremiumPlus 1000 Liter/ca.300Kg

UVP439,00 EUR
Nur 395,10 EUR

Güllekohle 2000 Liter/ca. 660 kg

UVP419,00 EUR
Nur 398,05 EUR

Pflanzenkohle Premium Plus500/0-1mm 1000 Liter bioaktiv

UVP429,00 EUR
Nur 407,55 EUR
0,41 EUR pro Liter

Die beste Erde unter der Sonne

Thank you for your attention

test report of biochar:

ÖkoregionKaindorf

eurofins | Umwelt

Prüfbericht zu Auftrag 11717955

Projekt: Pflanzenkohle gemäß Europäischem Pflanzenkohle Zertifikat EBC

Untersuchung nach Pflanzenkohle gemäß European Biochar Certificate			Grenzwerte		Probenbezeichnung	Holzkohle	
					Labornummer	117065547	
Parameter	Einheit	BG	GW 1	GW 2	Methode	anl	wf
Schüttdichte	kg/m³				DIN 51705 (FR-JE02)	373	-
spezifische Oberfläche BET-Verfahren	m²/g				DIN 66137 / DIN ISO 9277 (SUIB /f)	-	288,5
Reindichte	g/cm³				DIN 66137 / DIN ISO 9277 (SUIB /f)	-	1,70
Gesamtwasser	Ma.-%	0,1			DIN 51718 (FR-JE02)	58,9	-
Aschegehalt 550 °C	Ma.-%	0,1			analog DIN 51719 (FR-JE02)	4,8	11,7
Wasserstoff	Ma.-%	0,1			DIN 51732 (FR-JE02)	0,58	1,42
Kohlenstoff gesamt (TC)	Ma.-%	0,2	> 50	> 50	DIN 51732 (FR-JE02)	35,6	86,6
Stickstoff gesamt	Ma.-%	0,05			DIN 51732 (FR-JE02)	0,13	0,30
Sauerstoff (Diff.)	Ma.-%				DIN 51733, berechnet (FR-JE02)	0,4	1,0
Carbonat-CO2	Ma.-%	0,4			DIN 51726 (FR-JE02)	1,04	2,52
TIC (anorganischer Kohlenstoff)	Ma.-%	0,1			DIN 51726 (FR-JE02)	0,3	0,7
Kohlenstoff, organisch	Ma.-%				berechnet (FR-JE02)	35,3	85,9
H/C Verhältnis (molar)	ohne		< 0,6	< 0,6	berechnet (FR-JE02)	0,19	0,20
H/Corg Verhältnis (molar)	ohne		< 0,7	< 0,7	berechnet (FR-JE02)	0,20	0,20
O/C Verhältnis (molar)	ohne		< 0,4	< 0,4	berechnet (FR-JE02)	0,01	0,009
Schwefel gesamt	Ma.-%	0,03			DIN 51724-3 (FR-JE02)	< 0,03	0,05
pH-Wert (CaCl2)	ohne		≤ 10	≤ 10	DIN ISO 10390 (FR-JE02)	8,5	-
Leitfähigkeit	µS/cm	5			BGK Kapitel III. C2 (FR-JE02)	327	-
Salzgehalt	g/kg	0,005			BGK Kapitel III. C2 (FR-JE02)	1,73	4,20
Salzgehalt, berechnet mit Schüttdichte	g/l	0,005			BGK Kapitel III. C2 (FR-JE02)	0,644	1,57

test report of biochar:

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2,3,7,8-TetraCDD	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,278
1,2,3,7,8-PentaCDD	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,371
1,2,3,4,7,8-HexaCDD	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,742
1,2,3,6,7,8-HexaCDD	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,742
1,2,3,7,8,9-HexaCDD	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,742
1,2,3,4,6,7,8-HeptaCDD	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	1,94
OctaCDD	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	8,49
2,3,7,8-TetraCDF	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,495
1,2,3,7,8-PentaCDF	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,680
2,3,4,7,8-PentaCDF	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,680
1,2,3,4,7,8-HexaCDF	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,618
1,2,3,6,7,8-HexaCDF	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,618
1,2,3,7,8,9-HexaCDF	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,618
2,3,4,6,7,8-HexaCDF	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,618
1,2,3,4,6,7,8-HeptaCDF	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	1,26
1,2,3,4,7,8,9-HeptaCDF	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,587
OctaCDF	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 4,95
WHO (2005)-PCDD/F TEQ exkl. BG	ng/kg		< 20	< 20	berechnet (GF-A026 /f)	-	0,0345
WHO (2005)-PCDD/F TEQ inkl. BG	ng/kg				berechnet (GF-A026 /f)	-	1,43
I-TEQ (NATO-CCMS) exkl. BG	ng/kg		< 20	< 20	berechnet (GF-A026 /f)	-	0,0405
I-TEQ (NATO-CCMS) inkl. BG	ng/kg				berechnet (GF-A026 /f)	-	1,41

test report of biochar:

Untersuchung nach Pflanzenkohle gemäß European Biochar Certificate			Grenzwerte		Probenbezeichnung	Holzkohle	
					Labornummer	117065547	
Parameter	Einheit	BG	GW 1	GW 2	Methode	anl	wf
PCB 77	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 5,56
PCB 81	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 1,21
PCB 105	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	32,1
PCB 114	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 1,45
PCB 118	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	311
PCB 123	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	2,22
PCB 126	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 1,58
PCB 156	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	80,9
PCB 157	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	5,31
PCB 167	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	43,7
PCB 169	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 3,71
PCB 189	ng/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	4,18
WHO (2005)-PCB TEQ exkl. BG	ng/kg				berechnet (GF-A026 /f)	-	0,0144
WHO (2005)-PCB TEQ inkl. BG	ng/kg				berechnet (GF-A026 /f)	-	0,284
PCB 28	mg/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	< 0,000127
PCB 52	mg/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	0,000149
PCB 101	mg/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	0,000945
PCB 118	mg/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	0,000311
PCB 138	mg/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	0,00112
PCB 153	mg/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	0,00170
PCB 180	mg/kg				Hausverfahren (GC-HRMS) (GF-A026 /f)	-	0,000474
Summe 6 PCB exkl. BG	mg/kg		< 0,2	< 0,2	berechnet (GF-A026 /f)	-	0,00439
Summe 6 PCB inkl. BG	mg/kg				berechnet (GF-A026 /f)	-	0,00452
Summe 7 PCB exkl. BG	mg/kg		< 0,2	< 0,2	berechnet (GF-A026 /f)	-	0,00470
Summe 7 PCB inkl. BG	mg/kg				berechnet (GF-A026 /f)	-	0,00483

test report of biochar:

ÖkoregionKaindorf

Arsen	g/t	0,8	< 13	< 13	DIN EN ISO 17294-2 (FR-JE02)	-	< 0,8
Blei	g/t	2	< 150	< 120	DIN EN ISO 17294-2 (FR-JE02)	-	<2
Cadmium	g/t	0,2	< 1,5	< 1	DIN EN ISO 17294-2 (FR-JE02)	-	<0,2
Kupfer	g/t	1	< 100	≤ 100	DIN EN ISO 17294-2 (FR-JE02)	-	15
Nickel	g/t	1	< 50	< 30	DIN EN ISO 17294-2 (FR-JE02)	-	28
Quecksilber	g/t	0,07	< 1	< 1	DIN 22022-4 (FR-JE02)	-	<0,07
Zink	g/t	1	< 400	< 400	DIN EN ISO 17294-2 (FR-JE02)	-	63
Chrom	g/t	1	< 90	< 80	DIN EN ISO 17294-2 (FR-JE02)	-	34
Bor	mg/kg	1			DIN EN ISO 17294-2 (FR-JE02)	-	16
Mangan	mg/kg	1			DIN EN ISO 17294-2 (FR-JE02)	-	1190

Bestimmung aus dem Borataufschluss der Asche 550°C nach DIN 51729-1/ -11 - bezogen auf die Originalsubstanz (FR-JE02)

Phosphor (P) ber.	mg/kg				DIN EN ISO 11885 (FR-JE02)	-	1300
Magnesium	mg/kg				DIN EN ISO 11885 (FR-JE02)	-	1800
Calcium	mg/kg				DIN EN ISO 11885 (FR-JE02)	-	16000
Kalium	mg/kg				DIN EN ISO 11885 (FR-JE02)	-	4600
Natrium	mg/kg				DIN EN ISO 11885 (FR-JE02)	-	860
Eisen	mg/kg				DIN EN ISO 11885 (FR-JE02)	-	2900
Silicium	mg/kg				DIN EN ISO 11885 (FR-JE02)	-	26000
Schwefel	mg/kg				DIN EN ISO 11885 (FR-JE02)	-	340

test report of biochar:

ÖkoregionKaindorf

Bestimmung aus dem Toluolextrakt

Naphthalin (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	1,1
Acenaphthylen (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Acenaphthen (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Fluoren (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Phenanthren (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	0,4
Anthracen (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Fluoranthen (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	0,2
Pyren (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	0,2
Benz(a)anthracen (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Chrysen (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Benzo(b)fluoranthen (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Benzo(k)fluoranthen (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Benzo(a)pyren (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Indeno(1,2,3-cd)pyren (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Dibenz(a,h)anthracen (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Benzo(g,h,i)perylen (Toluol Extr.)	mg/kg	0,1			analog DIN EN 15527 (FR-JE02)	-	< 0,1
Summe PAK (EPA) (Toluol Extr.)	mg/kg		< 12	< 4	berechnet (FR-JE02)	-	1,90

Feedstock

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paper fiber sludge

grain husks

Die beste Erde unter der Sonne

The new biochar-plant produce 1-1,5 tons biochar per day

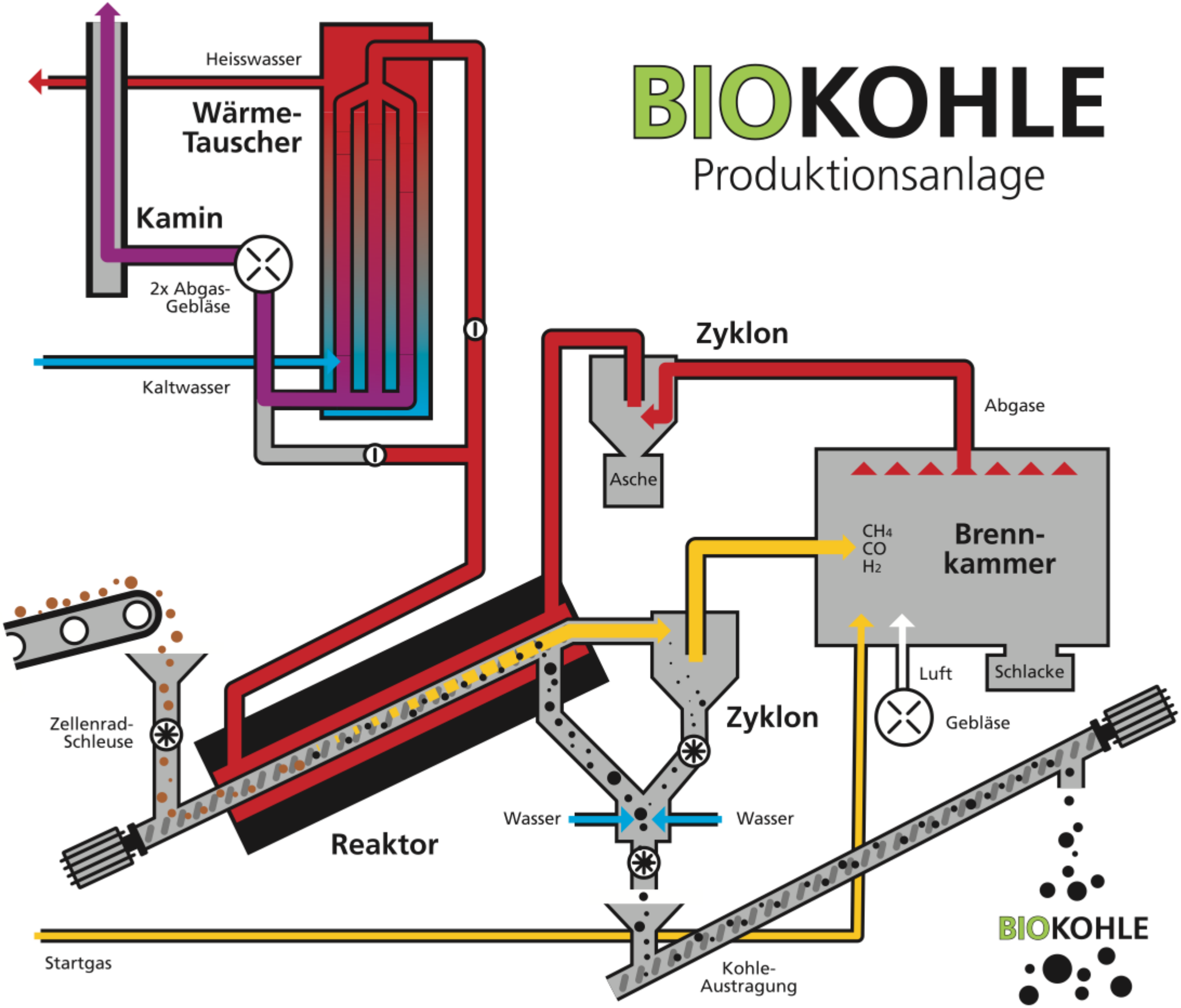
In the dryingbox we use the excess energy of the pyrolysis-process

The loading is large enough for the daily requirement of fuel

The charring is a pyreg reactor
In the background is the exhaust heat exchanger

BIOKOHLE

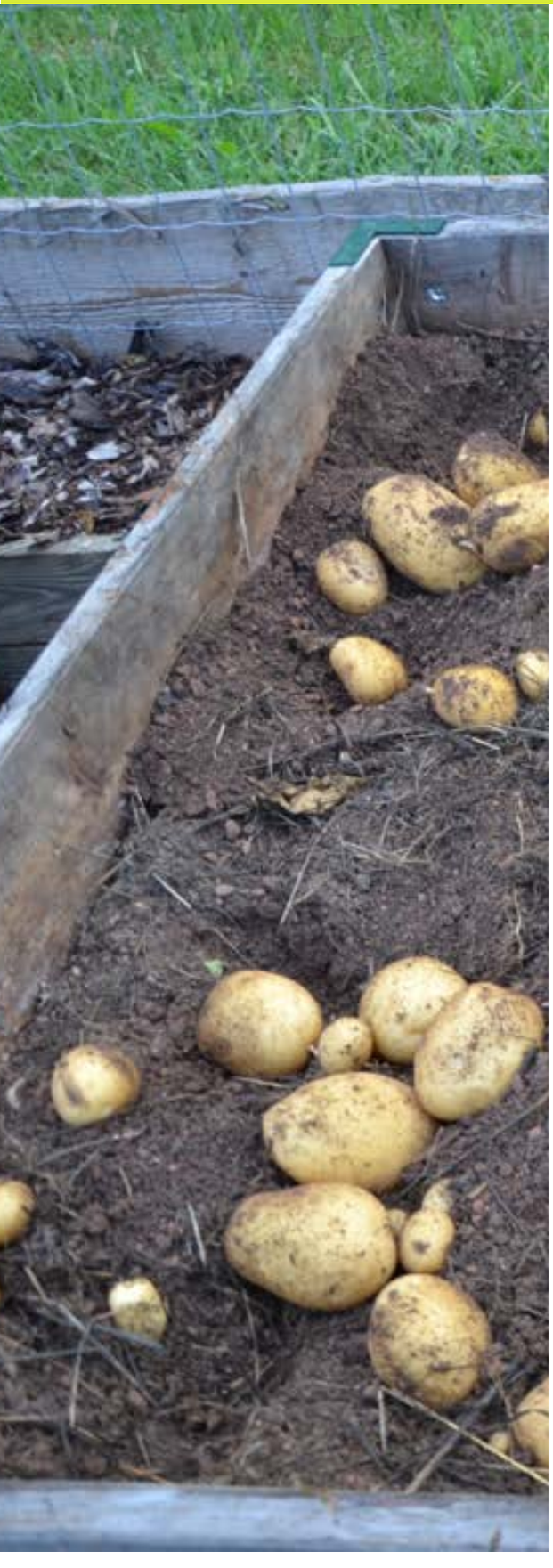
Produktionsanlage

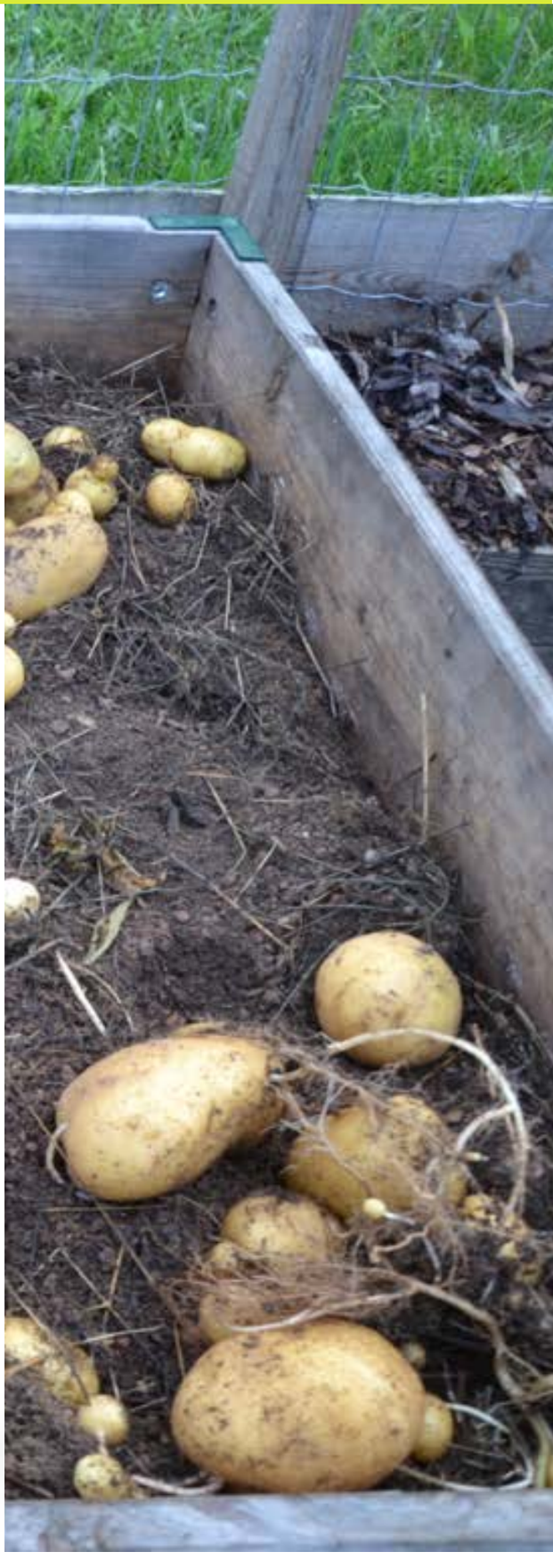


Terra Preta - do not promote soils…

… promote the results based on this soil!

… promote the results based on this soil!





FeedChar

- special mixtures of different biochars
- every animal needs a different feed char
- helps immediately with any problem which comes from the stomach
- two different lines for livestock and pets

Feed Char

charline
BIOCHAR PRODUCTS & TECHNOLOGIES

Die beste Erde unter der Sonne