

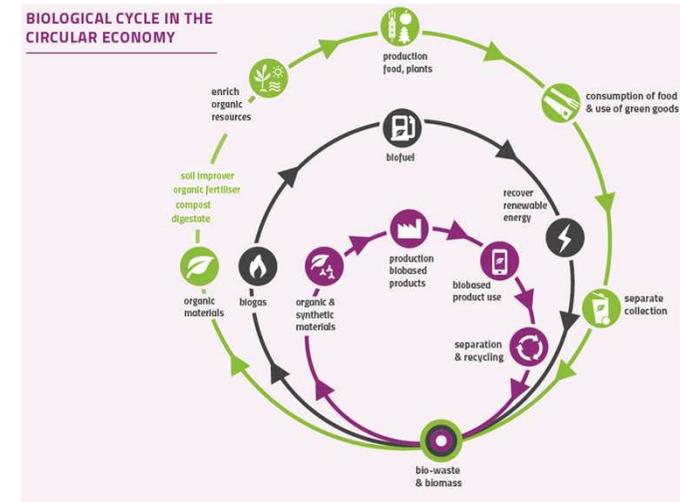
Compost Certification and use for organic farming

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European Compost Network ECN e.V.

European Compost Network

ECN's Vision

“Living well within the limited resources of the planet respecting the organic cycle”



ECN is the leading European membership organization promoting sustainable recycling practices in composting, anaerobic digestion and other biological treatment processes of organic resources.



European Compost Network

Status of ECN Membership

- 67 Members from 27 European Countries
- ECN represents more than 3.500 treatment plants (composting and anaerobic digestion) with more than 33 M tpa treatment capacities
- Compost production of 12-15 M tpa, used as
 - Organic Fertiliser
 - Soil Improver
 - Mixing component in Growing Media

ECN Survey 2017

Composting	Plants	Input [mio tonnes/a]
Greenwaste	1516	10.1
Biowaste	1272	13.4

Anaerobic Digestion	Plants	Input [mio tonnes/a]
Biowaste (incl. Commercial & industrial biowaste+manure)	2.150	24.1



EU Organic Farming Regulation



- **EU Legislation:**
 - (EC) No 834/2007 on organic production and labelling of organic products
 - Article 12 *Plant production rules*
 - Article 16 *Products and substances used in farming and criteria for their authorisation*
 - Implementation Regulation (EC) No 889/2008 + amending 2014
 - Article 3(1) *Soil management and fertilisation*
 - 1. *Where the nutritional needs of plants cannot be met by measures provided for in Article 12(1)(a), (b) and (c) of Regulation (EC) No 834/2007, only fertilisers and soil conditioners referred to in Annex I to this Regulation may be used in organic production and only to the extent necessary. Operators shall keep documentary evidence of the need to use the product.*
 - Annex I *Fertilisers and soil conditioners*



(EC) No 889/2008 – Annex I:

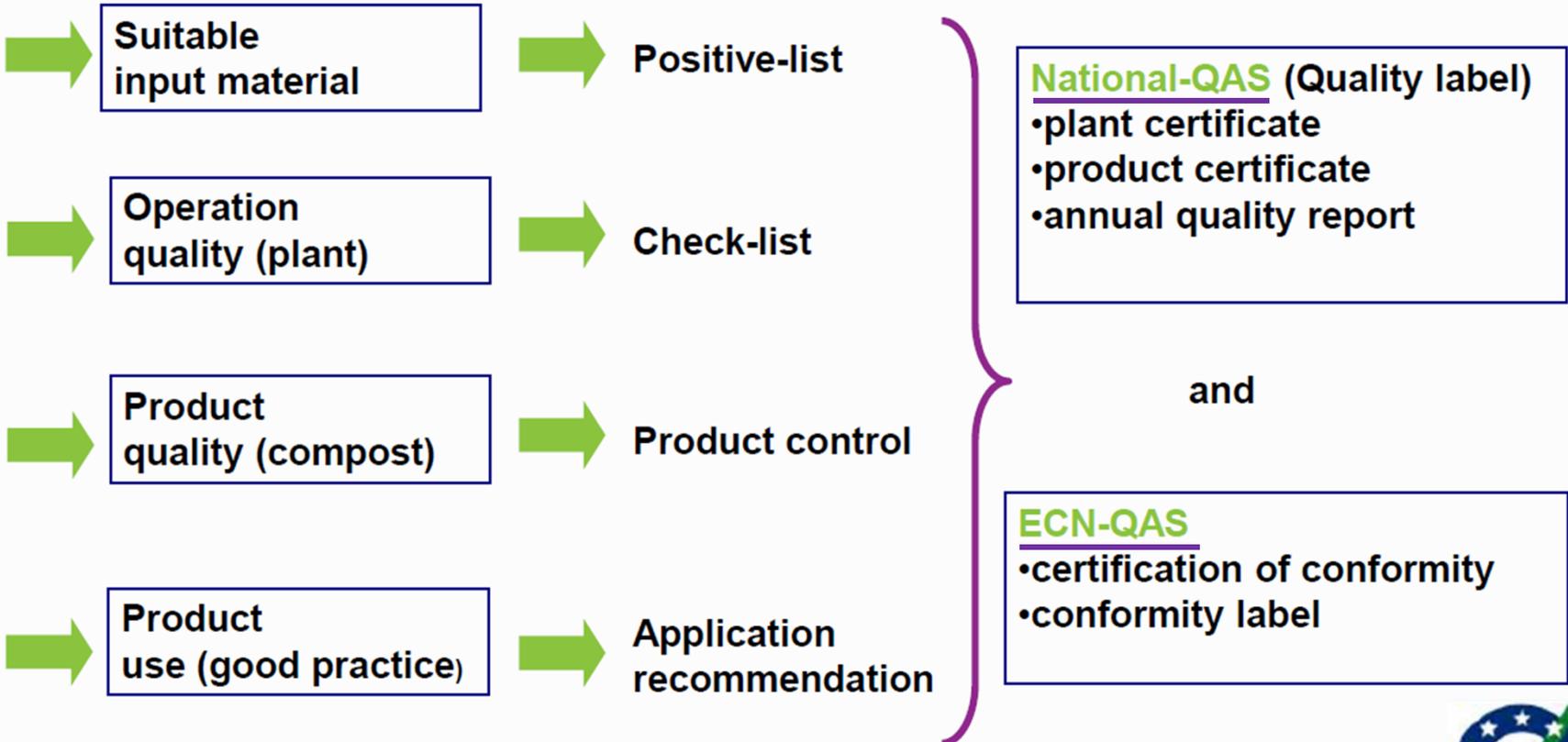


Fertilisers and soil conditioners -referred to Article 3(1)

A	Composted or fermented household waste <i>Biowaste compost and digestate</i>	<ul style="list-style-type: none">→ Product obtained from source separated household waste, which has been submitted to composting or to anaerobic fermentation for biogas production→ Only vegetable and animal household waste→ Only when produced in a closed and monitored collection system, accepted by the Member State→ Maximum concentrations in mg/kg of dry matter: cadmium: 0,7; copper: 70; nickel: 25; lead: 45; zinc: 200; mercury: 0,4; chromium (total): 70; chromium (VI): 0
A	Composted or fermented mixture of vegetable matter <i>Green waste compost Energie crop digestates</i>	→ Product obtained from mixtures of vegetable matter, which have been submitted to composting or to anaerobic fermentation for biogas production



Quality criteria for compost and digestates



Overview about environmental criteria

Criteria	ECN-QAS	PFC 1 (A)(I) *	PFC 3 (A) *	Organic farming Reg.
	Compost and Digestate solid	Organic Fertiliser solid	Organic Soil improver	Compost /digestate
Cd (mg/kg dm)	1,3	1,5	3	0,7
Cr IV / Cr (mg/kg dm)	- / Cr 60	2 / -	2 / -	0 / 70
Hg (mg/kg dm)	0,45	1	1	0,4
Ni (mg/kg dm)	40	50	50	25
Pb (mg/kg dm)	130	120	120	45
C ₂ H ₅ N ₃ O ₂ (g/kg dm)	-	12	-	-
Salmonella spp.	absent	absent	absent	absent
Escherichia coli / Enterococcaceae (CFU/g)		≤ 1000	≤ 1000	≤ 1000

* Status September 2017



Overview about environmental criteria

Criteria	ECN-QAS	Fertilisers Reg.	Fertiliser Reg.	Organic farming Reg.
	Compost and Digestate solid	Digestate (CMC 5)	Compost (CMC3)	Compost /digestate
Cu (mg/kg dm)	300	-	-	70
Zn (mg/kg dm)	600	-	-	200
PAH ₁₆ (mg/kg dm)	-	6	6	-
Weed seeds (seeds /L)	≤ 2			
Impurities (% dm)	≤ 0,5			
Stability				
- Oxygen Update rate (mmol O ₂ / OM *h)	-	50	25	-
- Rotting degree	-	-	III	-
- Residual Gas potential (liter biogas/g volatile solids)	-	0,45	-	-

Requirements for biowaste-compost use in organic farming in Germany

- **National - Germany:-**
 - ✓ Compliance with the German Biowaste Ordinance
 - ✓ Compliance with the German Fertiliser Regulation
 - ✓ Approved quality assurance system (RAL –GZ 251)
- **Europe:**
 - ✓ Compliance with EU Regulation on Organic Production (EC) No 834/2007 / (EC) No 889/2008
- **Additional requirements from Organic farming associations:**
 - ✓ Bioland/Naturland



Bioland/Naturland: Opening of internal cycle for compost from separate collected household waste



Bioland argumentation:

- Basis principle of organic farming is managing in cycles. Markt products for consumer take nutrients out of the internal farm cycle.
- Nutrient export connected with the sale of markt products have to bring back these nutrients to soils as possible
- Compost from seperate collected household waste consists of nutrients from former vegetables produced in organic farming systems



Bioland/Naturland open an defined external cycle for „recycled“ nutrients in the form compost as an organic fertilising product



Bioland/Naturland: Requirements for use of biowaste-compost

- BIOLAND /Naturland open their guidelines for RAL-certified compost by amending additional requirements (in 2015)
 - Reapproval of biowaste-compost produced from separate collected household-waste
 - Criteria agreement with BGK e.V and producer associations, dated by 27.06.2016





Kriterien für die Verwendung von Kompost aus Bioabfällen aus der getrennten Sammlung aus Haushaltungen (Biotonne) sowie für Grünutkomposte

Kriterien-Stand: 27.06.2016

Geltungsbereich und Definitionen:

- Definitionen:
 Bioabfall = Sammelbegriff laut Bioabfall-Verordnung (BioAbfV)
 Biogut = Sammelgut, das über die Biotonne in Haushalten separat erfasst wird
 Grüngut = Sammelgut aus separater Sammlung oder Anlieferung von Grünschnitt
- Sämtliche Kriterien gelten für Kompost aus Biogut (Bioabfällen aus getrennter Sammlung aus Haushaltungen, Biotonne) und Gemische aus Biogut-Kompost mit Grünutkompost.
- Für Grünut-Kompost gelten nur die entsprechend gekennzeichneten Kriterien
- Gültig nur für Komposte; im Fall einer vorgelagerten Vergärung der Bioabfälle nur, wenn die festen Gärrückstände nachkompostiert und als gütegesicherte Komposte gekennzeichnet sind.

Es gelten als Basis die gesetzlichen Vorgaben des Abfall- und Düngerechts und die Vorgaben des RAL-Gütezeichens Kompost. Darüber hinaus gelten die folgenden Anforderungen:

1. Anforderungen an die jeweilige Charge
 - Gültig für Biogut- und Grünut-Komposte -

Die aufgeführten Anforderungen/Grenzwerte werden bei der Untersuchung einzelner Chargen geprüft. Sind alle Kriterien erfüllt, wird auf dem Prüfzeugnis als „geeignet für Bioland“ ausgewiesen.

Merkmal	Anforderung/Grenzwerte
Ausgangsmaterial	<ul style="list-style-type: none"> • Biogut, d.h. Bioabfälle aus der getrennten Sammlung aus Haushaltungen (Biotonne) • Grüngut (Grünschnitt) aus getrennter Erfassung • Gemisch aus Biogut und Grünut
Zuschlagstoffe, die evtl. zu Beginn des Kompostierungsprozesses zugesetzt werden	<ul style="list-style-type: none"> • Stoffe gem. Anhang I der Verordnung (EG) Nr. 889/2008
Rottegrad	<ul style="list-style-type: none"> • In der Regel Komposte mit Rottegrad 4 oder 5 • Abgabe von Frischkompost Rottegrad 2 oder 3 nur mit dem Hinweis auf dem Prüfzeugnis, dass evtl. ein höheres Geruchsponenzial besteht
Fremdstoffe Gewicht (gesamt)	<ul style="list-style-type: none"> • max. 0,3 Gew.-% i.d.TM auslesbare Fremdstoffe über 2 mm Durchmesser
Fremdstoffe Flächensumme	max. 15 cm ² Flächensumme pro Liter FM.
Steine	max. 5 Gew.-% >10 mm i.d.TM
Hygiene (Phytohygiene)	<ul style="list-style-type: none"> • 0 keimfähige Samen bzw. austriebfähige Pflanzenteile / Liter FM
Schwermetalle	Max. mg/kg in TM: <ul style="list-style-type: none"> • Cadmium: 0,7 • Kupfer: 70 • Nickel: 25 • Blei: 45 • Zink: 200 • Quecksilber: 0,4 • Chrom (insgesamt): 70 • nur für Biogut-Kompost: Chrom (VI) nicht nachweisbar

Seite 1 von 2

FiBL-List of approved products for Organic Farming in Germany

- Facilities (Composting plants) producing quality assured compost and fulfilling the EU Regulation on Organic farming (EU Regulation No. 834/2007) are listed in the official approved products list of the Research Institute for Organic Farming (FiBL)



www.fibl.org



Quality assessment by BGK e.V and Bioland advisors

Compost plant

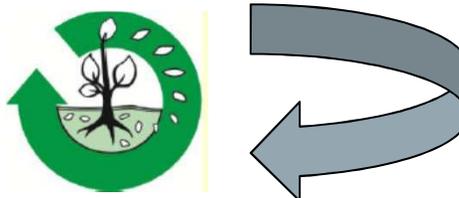


Bioland *Inspection compost plant before approval*

Input material

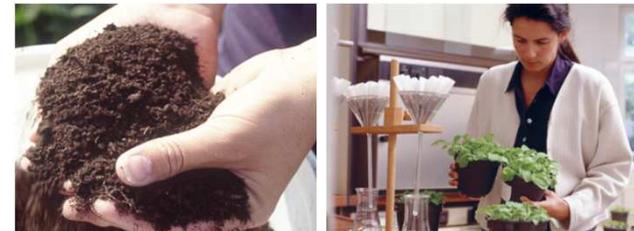


Composting process -
hygienisation - stabilisation



RAL Product certificate																																											
RAL-GZ 251																																											
PC-Nr.: 0909-1006-016																																											
Mature compost (middle grain size)																																											
RAL-Gütesicherung Kompost Basis als Düngemittel																																											
Seite 1 of 2																																											
Page: 1/2																																											
Page: 1/2																																											
Date of sample taking: 08.03.2010																																											
Legal requirements: <input checked="" type="checkbox"/> Biowaste regulation <input checked="" type="checkbox"/> Fertiliser regulation <input checked="" type="checkbox"/> EU EcoLabel <small>Compliance with regulations is attested by the producer.</small>	Systems of rules: <input checked="" type="checkbox"/> RAL Quality assurance (RAL-GZ 251) <input checked="" type="checkbox"/> Water production area suitable for water production area (W) <input checked="" type="checkbox"/> Operating resource for organic farming (OR, No. 100000) 																																										
Declaration of quality assurance¹⁾ Material Compost for soil regulation Organic matter content (OM) (min. 40%) Total phosphorus (TP) (min. 0.15%) Total nitrogen (TN) (min. 0.20%) Total potassium (TK) (min. 0.20%) Heavy metal content (max. 10 mg/kg) Chloride content (max. 10 g/kg) pH-value (min. 4.5, max. 10.5) C/N ratio (min. 20, max. 40) C/P ratio (min. 10, max. 20) C/K ratio (min. 10, max. 20) Humus C (min. 10, max. 20) Higher requirements fulfill: Free of seeds and plant parts Capable of spreading 1) The certificate is issued by the RAL Quality assurance system (RAL-GZ 251). The certificate was electronically checked. It is valid without signature.	Characteristics and standards <table border="1"> <tr><td>OM</td><td>58.5</td><td>50.0</td></tr> <tr><td>N</td><td>2.2</td><td>1.5</td></tr> <tr><td>P</td><td>0.24</td><td>0.15</td></tr> <tr><td>K</td><td>0.26</td><td>0.20</td></tr> <tr><td>TP</td><td>0.27</td><td>0.17</td></tr> <tr><td>TN</td><td>0.29</td><td>0.20</td></tr> <tr><td>TK</td><td>0.26</td><td>0.20</td></tr> <tr><td>HM</td><td>10.0</td><td>10.0</td></tr> <tr><td>Cl</td><td>10.0</td><td>10.0</td></tr> <tr><td>pH</td><td>7.6</td><td>4.5 - 10.5</td></tr> <tr><td>C/N</td><td>14.0</td><td>20 - 40</td></tr> <tr><td>C/P</td><td>10</td><td>10 - 20</td></tr> <tr><td>C/K</td><td>10</td><td>10 - 20</td></tr> <tr><td>Humus C</td><td>10.0</td><td>10.0</td></tr> </table>	OM	58.5	50.0	N	2.2	1.5	P	0.24	0.15	K	0.26	0.20	TP	0.27	0.17	TN	0.29	0.20	TK	0.26	0.20	HM	10.0	10.0	Cl	10.0	10.0	pH	7.6	4.5 - 10.5	C/N	14.0	20 - 40	C/P	10	10 - 20	C/K	10	10 - 20	Humus C	10.0	10.0
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Application recommendations Application: see Manual 4.18 Landworking: see Manual 4.18 Soil conservation: see Manual 4.18	Range of application Application: Landworking: Soil conservation:																																										

Bioland advisor : Compost application **Bioland**



Conformity assessment RAL -and Bioland/Naturland compost criteria



Quality Certification – BGK -Germany

RAL-Quality Assurance with Product certificate „suitable for Organic farming or Bioland/Naturland“ based on an individual tested batch:

- RAL-Quality assurance
- Legal conformity
- Product declaration according to German Fertilizer regulation
- Application requirements for use in agriculture
- ...



RAL
RAL-GZ 251

Product certificate

PZ-Nr.: 9999-1005-016

Mature compost
(middle grain size)

RAL-Gütesicherung Kompost
Batch examination
Side 1 of 2

Plant: Musterwald
(BGK-Nr.: 9999)

Batch: 19/09
Date of sample taking: 08.03.2010

Legal requirements:

- Biowaste regulation
- Fertiliser regulation
- EU-Ecolabel

Systems of rules:

- RAL-Quality assurance (RAL-GZ 251)
- Water protection area (suitable for water protection area III)
- Operating resource for organic farming (FiBL Nr. 125999)



Compliance with regulations is affirmed by ticked box.

Declaration of quality assurance¹⁾

Marking
pursuant fertilizer regulation
Organic NPK-fertiliser 0,86-0,39-0,72
using greenwaste, organic waste
0,86 % N total Nitrogen
0,39 % P₂O₅ total Phosphat
0,72 % K₂O total Potassium

Netomass: see delivery receipt

Producer/manufacturer:
Mustermann GmbH
Muster Allee 1
04567 Musterstadt

Source material:
Green waste, separate collected organic household waste (65%)

Minor components:
0,44 % MgO total Magnesiumoxide
24,3 % Organic matter

Storage and application:
Outdoor storage is possible in consideration of other legal requirements. Water logging, degradation and eluviation must be avoided, otherwise dry storage is required. Essential changes of the material are not to expect. Details for proper application: see application recommendations. Official advice has to be preferred regarding by application on agricultural area the legal restrictions by waste regulations (Biowaste regulation, sewage sludge regulation) for application and ratio must be considered.
Organic fertiliser using animal by products. Admission of farmed animals is prohibited for the next 21 days.
No Application on pasture land.

Characteristics and ingredients
in fresh mass

	kg/t	kg/m ³
Nitrogen total (N)	8,63	5,58
Nitrogen CaCl ₂ -soluble (N)	0,24	0,16
Nitrogen countable (N) ²⁾	0,66	0,43
Phosphate total (P ₂ O ₅)	3,97	2,57
Potassium total (K ₂ O)	7,20	4,65
Magnesium total (MgO)	4,41	2,85
Basic substances (CaO)	25,77	16,65
pH-value	7,6	
Salinity	4,44 g/l	
C/N-ratio	16	
Organic matter	243 kg/t	
Humus-C	72 kg/t	

Hygiene requirements fulfilled
Free of seeds and plant parts capable of sprouting

Grain size	0 - 25 mm
Bulk density	646 kg/m ³
Dry mass	62,10 %
Fertiliser value ³⁾	9,62 €/t 6,21 €/m ³
Humus value ⁴⁾	12,24 €/t 7,91 €/m ³

Purpose
For soil improvement and fertilisation, suitable as mixing compound for potting soils and growing media

Range of application
Agriculture
Landscaping
Soil manufactory

Application recommendations
Agriculture: see Attachment LW
Landscaping: see Attachment LB

The product is controlled by RAL-Quality assurance system (RAL-GZ 251).
This certificate was electronically created. It is valid without signature.



Bundesgütegemeinschaft Kompost e.V.
Köln, 28.05.2010



Compost application – Nutrient nutrient demand and nutrient balance of the crop rotation

- Legal upper limit according national regulations (German Biowaste Ordinance)
- „Good code of practice“ according to German Fertilising Act
- Bioland Guidelines: max. 20 t/ha dm in 3 years crop rotation

➔ Accounting of nutrient supply:

- N – in 1. year of application about 5% of total N-supply and 10 % of N-supply in 3 following years /Plant-available, accountable N-portion for a 3-year-crop rotation; about 15% of total N-supply from compost

- P_2O_5 – 100% accounting

- K_2O - 100 % accounting



Compost application – Example for nutrient supply

- Biowaste compost - certified Bioland/Naturland quality – NUTRIENT content and amounts according to 20 tons (dry matter) /ha/3 years

	N kg / t	P₂O₅ kg/ t	K₂O kg/t
Nutrient content (fresh mass)	7,0	3,0	6,0
Application rate compost: 20 t dm / ha / 3 a = 31 ton fresh mass (based on 65% dm)	217	93	186



BGK-Quality certified compost with FiBL-listing (2017) and BIOLAND-recognition, Germany

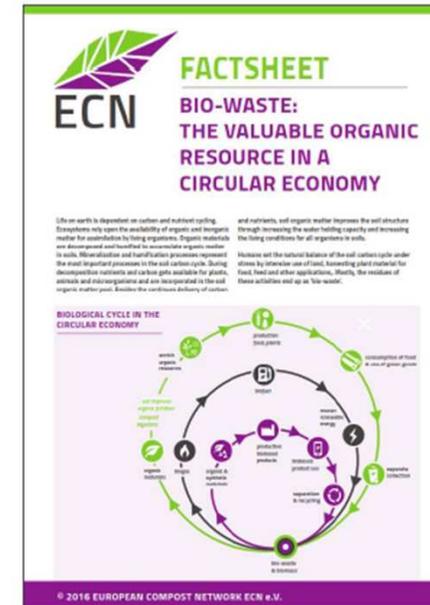
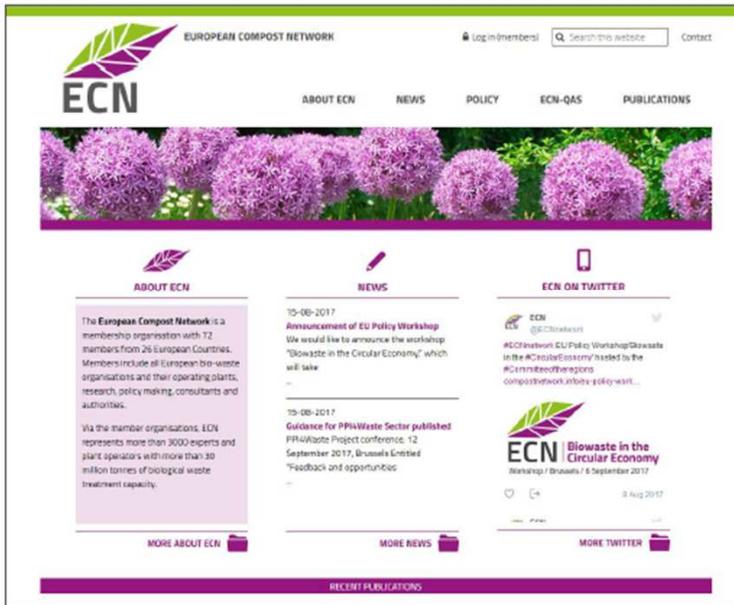
- Composting and digestion plants with FiBL-Listing 2017:
 - 199 Composting plants
 - 7 Co-Fermentation plants
 - 4 Renewable Energie crop digestion plant
- Composting and digestion plants with Bioland/Naturland recognition:
 - 47 Composting plants (including 13 greenwaste composting plants)

Germany / 2016: About **50.000 tons** of RAL-quality assured compost produced from biowaste and greenwaste, fulfilling the FiBl / Bioland-Naturland criteria were market to organic farming operators in Germany.

About **29%** of the composting and digestion plants had an FiBL recognition.



Further information



www.compostnetwork.info

EUROPEAN COMPOST NETWORK ECN e.V.
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