# Compost from Biodegradable Waste – Status and Results of Quality Assurance in Germany

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Bundesgütegemeinschaft
Kompost e.V.

# BGK and RAL

**Bundesgütegemeinschaft Kompost e.V. (BGK) is a self-obligatory measurement of the industry and is recognised by the responsible legal authorities.**

**BGK was founded in 1989.**

**The RAL quality assurance for compost was established in Germany in 1991.**

**RAL-quality labels identify a standardised and regularly checked product.**

# Quality Products in Germany

**Compost products (RAL-GZ 251):**

- fresh compost
- mature compost
- substrate compost



**Digestate products (RAL-GZ 256/1):**

- solid and liquid digestates

**Composted sludge products (RAL-GZ 258):**

- sludge-based mature compost
- sludge-based fresh compost

# Quality Assurance Labels in Germany

RAL-GZ 256/1




56 plants

12 plants

RAL-GZ 258




RAL-GZ 251




425 plants

# Compost from Biodegradable Waste

**Biowaste is defined as any vegetable or animal waste destined for utilisation that can be degraded by micro-organisms, soil organisms or enzymes.**



**Treated biowaste shall mean**

- **biowaste from an aerobic treatment process  compost**
- **biowaste from an anaerobic treatment process  digestate products**

# Compost from Biodegradable Waste

**Currently about 50 % of German households are involved in the separate collection of biowaste (bio-bins/bio-containers).**



**Approximately 8 million tons of biowaste are treated in 800 composting plants to produce 5 million tons of compost.**



**70 % of the produced compost is labelled with the quality label RAL-GZ 251**

# Composting plants

**Open windrow composting more or less for park and garden waste, smaller amount of input materials < 10,000 t**

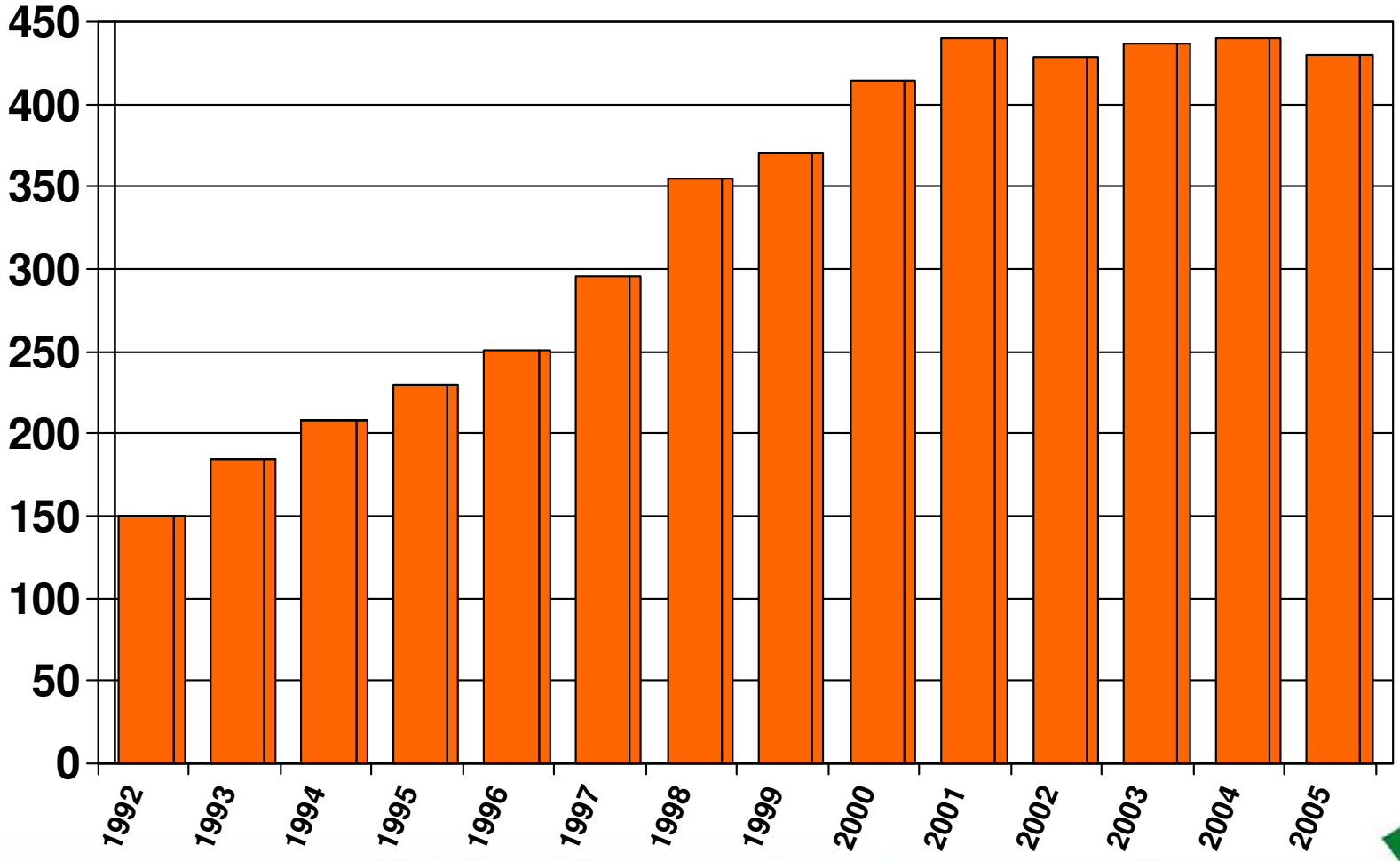


**Closed composting systems for biowaste from households, often more than > 10,000 t of input materials**

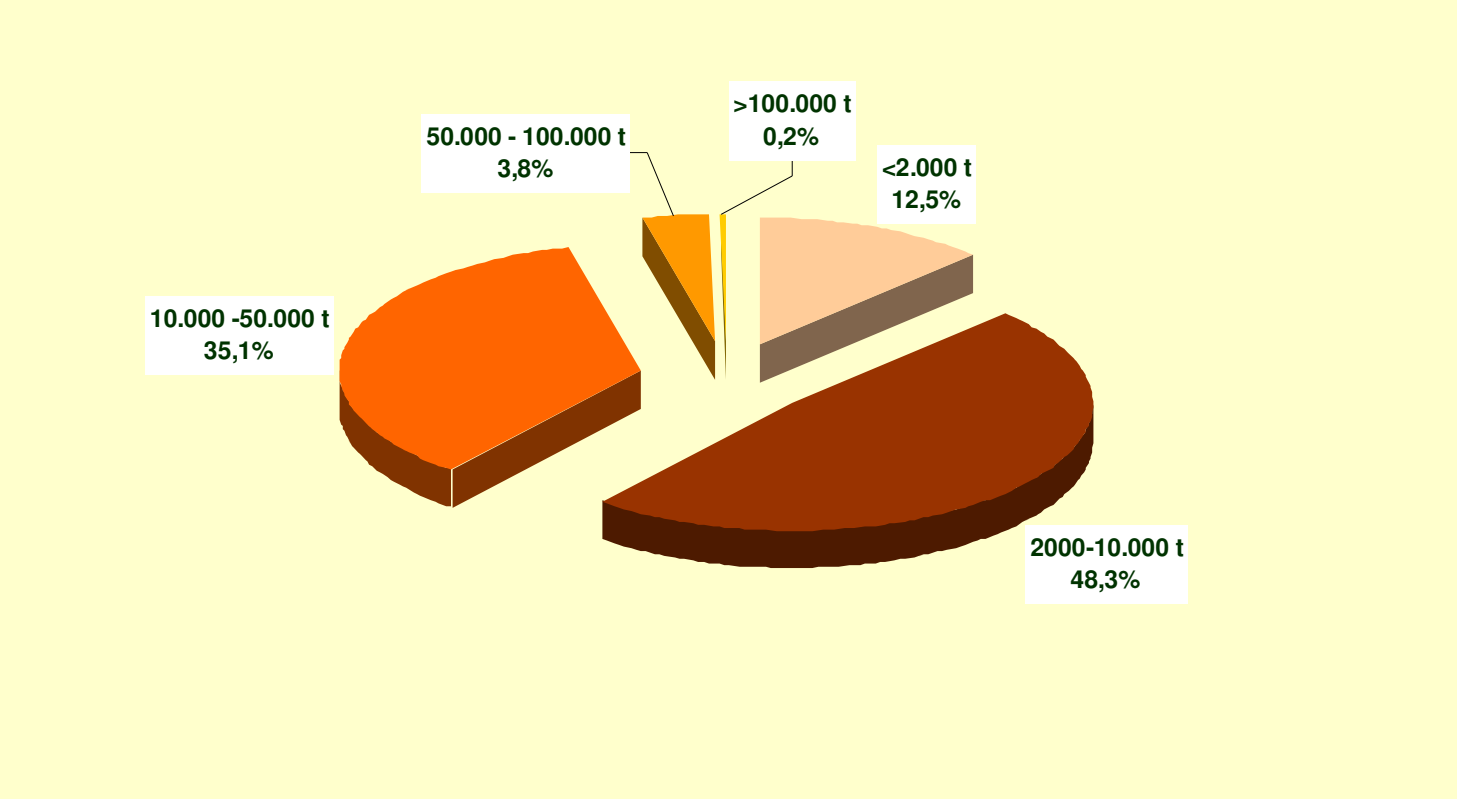
- **tunnel systems**
- **box/container systems**
- **briquetes systems**
- **windrow systems**



# Composting plants



# Input Amount of Composting plants



# Legal specifications in Germany (1)

**Ordinance on Biowastes (BioAbfV 1998)**

- on the utilisation of biowastes on land used for agricultural, silvicultural and horticultural purposes
- is defined for untreated biowastes, aerobically treated biowastes (composts) and anaerobically treated biowastes (digestate products)
- regulates the process requirements, the hygienic and precautionary environmental aspects of the material and includes requirements for the application

# Legal specifications in Germany (2)

**Fertiliser regulation - relevant for agriculture and gardening**




- Fertiliser regulation (DüV 2006)
- Ordinance for the declaration of fertilisers, soil improving agents, growing media and plant protection agents (DüMV 2003) □ at this point composted waste turns into a labelled product

# Legal specifications in Germany (3)

**Soil protection act**

**- relevant for landscaping**

- **Federal Soil Protection and Contaminated Sites Ordinance** (BBodSchV 1999)



**Sewage Sludge Ordinance – relevant for composted sewage sludge** (AbfKlärV 1992,under revision)

# Targets of quality assurance

- specification of products with a guaranteed homogenous quality
- enhancement of product quality and operation quality
- guarantee for a successful use of the products

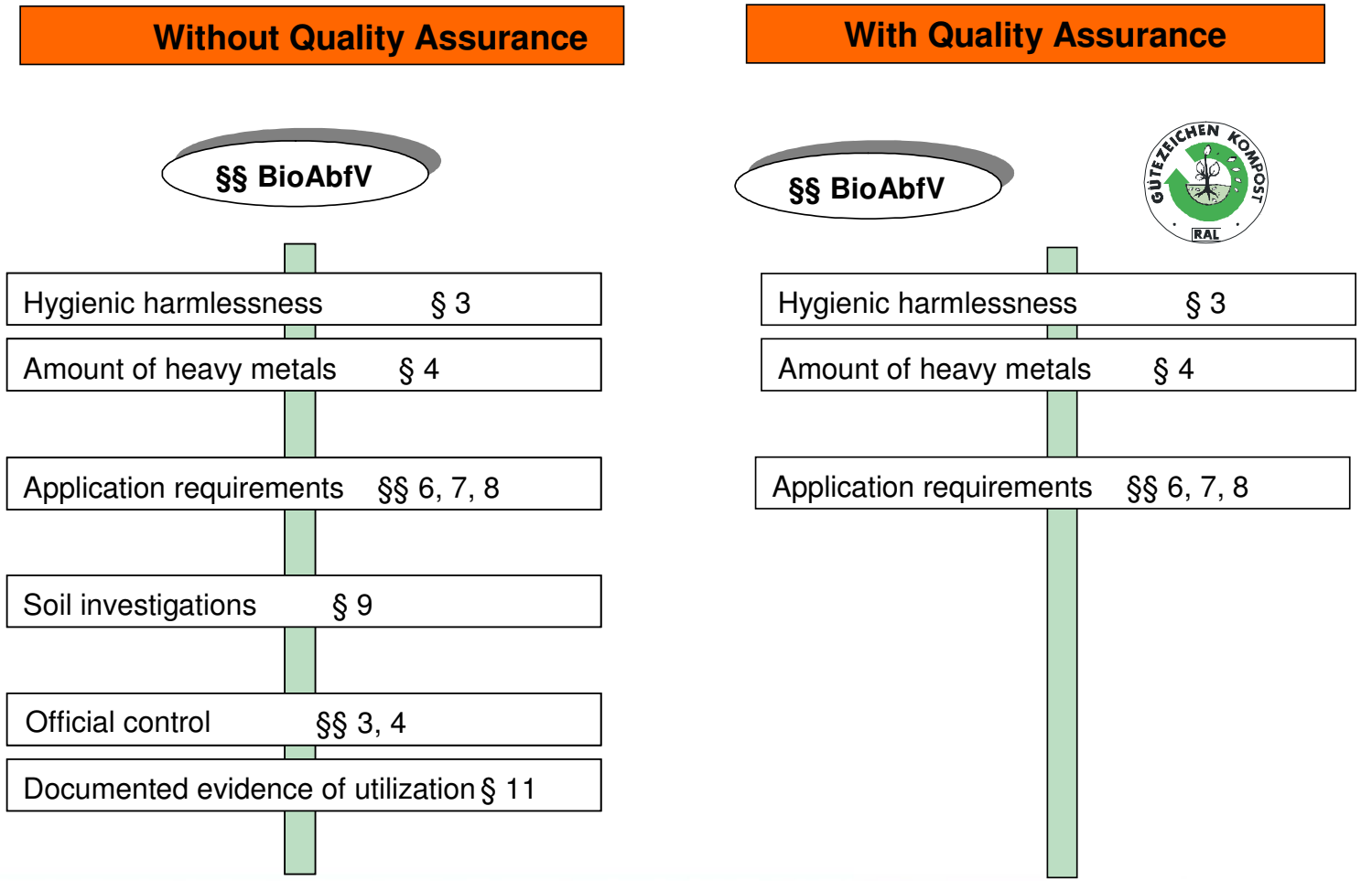
- deregulation and recognition of certified products by legal authorities, in agricultural systems and by food processing industry
- promotion of the re-use of waste "from waste to product"

# Preconditions of quality assurance

- The Producer must have the readiness to invest in quality assurance.
- A consumer demand for certified products must exist.

- The requirements for the producer with quality assured products must be reduced.
- The recycling products must be equivalent with primary products.

# Advantages of Quality Assurance



# Contents of Quality Assurance System

**Suitable Input Materials**

- in accordance with the biowaste ordinance and fertiliser regulation.
- operation control by plant visits of independent quality managers.
- control by independent sample takers and by declaration in analysis report.

**Independent analysis and declaration of the product quality**

- 4 - 12 times a year according to the quality guidelines, depends on the amount of input material.
- control and sanctions by an independent quality committee.
- certification with product declaration according to the fertiliser regulation

**Application requirements**

- application requirements based on the biowaste ordinance and fertiliser regulation.
- application requirements due to good practical use.

**Composting Plant**

Member of Quality Assurance Organisation (BGK)

**Sample Taker**

**Quality Committee**

control, sanctions, measures

**Acknowledged Laboratory**

**Quality Assurance Organisation**

central data base

# Operation quality



**is characterised by**

- **suitable input materials,**
- **operation conditions for sanitization (55 °C for two weeks or 65 °C (60 °C in closed plants) for one week,**
- **hygiene model type system (HBPS),**
- **good plant management (reduction of odour emissions, effective separation of impurities).**

**is proved by**

- **regular plant inspections.**

# Product quality

## Valuable criteria

- **Rotting degree**
- **Grain size**
- **Bulk density**
- **pH-value, salt content**
- **Plant nutrients**
- **Carbonats**
- **Organic matter content**

## Precautionary environmental criteria

- **Hygienic aspects (salmonellae)**
- **Weeds and plant response**
- **Impurities**
- **Potential toxic substances (heavy metals)**
- **Degree of pollution (visible content of impurities)**

# Product quality – valuable criteria

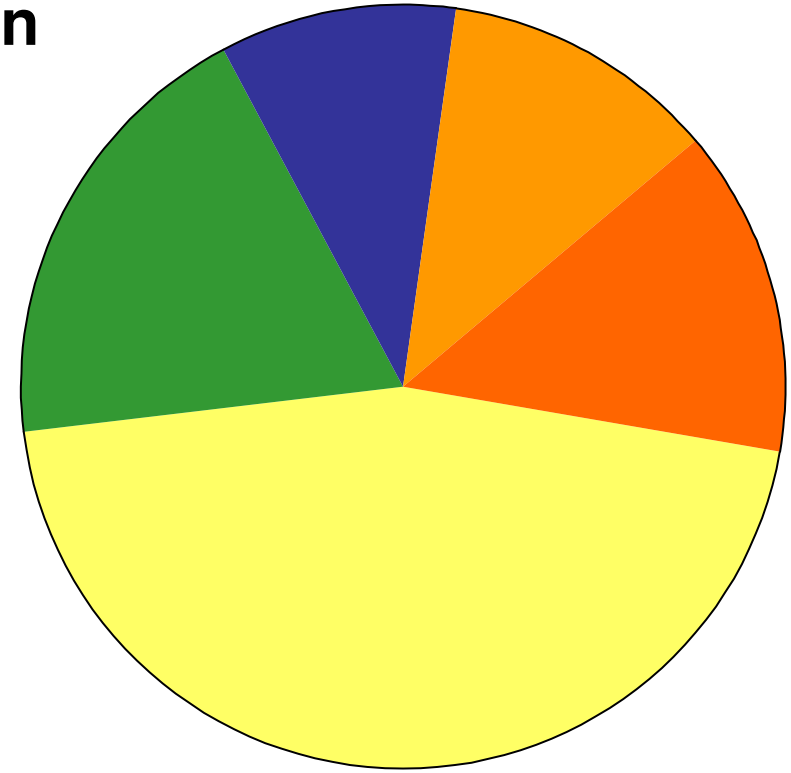
| Parameter | Average of 2004 | Average of 2005 |
|---|---|---|
| $OM_{LOI}$ [%] | 38.59 | 38.57 |
| $N_t$ [% / dm] | 1.41 | 1.43 |
| $P_2O_5$ [% / dm] | 0.66 | 0.70 |
| $K_2O$ [% / dm] | 1.09 | 1.15 |
| $MgO_t$ [% / dm] | 0.76 | 0.78 |
| CaO [% / dm] | 4.54 | 6.52 |
| $NH_4$-N+$NO_3$-N [mg/l FM] | 332.56 | 342.21 |
| Salt content [gl FM] | 4.91 | 5.07 |
| pH-value | 7.51 | 7.54 |

# Precautionary environmental criteria

| Parameter | Average of 2004 | Average of 2005 |
|---|---|---|
| Impurities > 2mm [% dm] | 0.14 | 0.16 |
| Stone > 5mm [% / dm] | 1.63 | 1.64 |
| Pb [mg /kg dm] | 43.92 | 41.61 |
| Cd [mg /kg dm] | 0.47 | 0.45 |
| Cr [mg /kg dm] | 23.85 | 22.61 |
| Cu [mg /kg dm] | 49.76 | 49.54 |
| Ni [mg /kg dm] | 14.93 | 14.55 |
| Zn [mg /kg dm] | 179.53 | 177.55 |
| Hg [mg /kg dm] | 0.14 | 0.13 |

# Marketing structure

## Current marketing situation for compost in Germany



| | |
|---|---|
| Agriculture | 45 % |
| Landscaping | 19 % |
| Market gardening | 10 % |
| Hobby gardening | 12 % |
| Substrate industry | 14 % |

# QAS as an important marketing tool

**In several food processing industries only quality assured compost products are allowed:**

- **Sugar beet industry**
- **QAS of cropping systems**
- **Organic farming system**
  **(200 composting plants are listed in the official input material list of the organic farming organisation)**

**In environmental conventions of potential risk areas:**

- **Water protection areas**

# Information

**Publications**

Quality assurance guidelines for composts and digestate products

Methodbook for the analysis of organic feritliser, soil improver and substrates

Humuswirtschaft & Kompost - printed version 2 times a year

Humuswirtschaft & Kompost *Aktuell* – online version monthly




**Application brochures (4 pages) -**

Hobby gardening, market gardening, landscaping etc.

**Comprehensive brochures (20 – 30 pages) -**

Organic fertilising in cropping systems,

Compost application in landscaping




**Website** **www.kompost.de**