State of the Art of Composting in Austria ÖWAV-Regelblatt 518

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1

State of the Art of Composting in Austria Preliminary Remark

Legal Situation in Austria:

- **Compost Ordinance 2001** (BGBl. I Nr. 292/2001) regulates „compost quality“
  ➔ product compost (end of the waste regulation)
- **Stand der Technik der Kompostierung** (guideline about state of the art, 2005)
- **Anforderungen an den Betrieb von Kompostanlagen (ÖWAV-RB 518)**
  „manual“ for operation, 2009
- **Technische Anforderungen an Kompostierungsanlagen (Ö-NORM S 2205)**
  standard for construction, 1999 / 2008 / 2017

2

State of the Art of Composting in Austria
Preliminary Remark

Current Activities

- **Compost Ordinance 2001** (BGBl. I Nr. 292/2001)
  a new one is in discussion
  (first draft by an expert team 2020)
  regulates „compost quality“ **+ operation af the plant**
  ➔ product compost (end of the waste regulation)
- **Anforderungen an den Betrieb von Kompostanlagen (ÖWAV-RB 518)**
  brief description of the state of the art
  (first draft by an expert team 2021)
- **Technische Anforderungen an Kompostierungsanlagen (Ö-NORM S 2205)**
  standard for construction, 2017 (adaption??)

3

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Table of contents

1. Terms / Definitions
2. Legal Basics
3. Professional and Technical Fundamentals
   (1) Location
   (2) Collection and Transport
   (3) Delivery
   (4) Pre-treatment
   (5) Rotting Process
   (6) Emissions
   (7) Rotting Systems
4. Requirements on Operation
   (1) Feedstock Materials
   (2) Parts of the Composting Plant
   (3) Equipment
   (4) Quality Management

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4

Terms and Definitions

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Terms and Definitions

definition of "composting"
according to Austrian Compost Ordinance, 2001:

„controlled, aerobic, exothermic biological transformation of biodegradable organic materials (including a thermophilic phase) into a product reach in stable humic compounds with minimum 20% (m/m) of organic fraction"

actions necessary to reach a well defined target

temperatures > 55 °C

energy (heat) is preoduced during processing ➔ aerobic

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Chapter 3

Professional and Technical Fundamentals

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influence of collection and transportation

- quality of input (clean separation, collection interval, type of collection vehicle)
- collection interval: (if too long ➔ degradation process starts, acidification, odour)
  during vegetation period max. 7 days
  outside vegetation period up to 14 days
- control of collection bins prior emptying should be done (disposal as residual waste if share of impurities is >2 %, between 2 and 5 % of impurities sorting out by pretreatment is allowed)

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requirements on pretreatment

- = mechanical treatment to optimise material for processing (separation of impurities, shredding, addition of H_2O or additives, homogenisation)
- shredding of wastes rich in structure (tab.3)
  target: ➔ <400 kg/m^3, max. grain size >40 mm
- wastes poor in structure (tab. 4): **daily pre-treatment** and start of intensive rotting phase
- minium share of structure rich materials for different waste types

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the rotting process

the understanding of the fundamentals of the rotting process is essential for proper processing

- water (microbes can take up nutrients and oxygen only if they are dissolved!)
- oxygen (for aerobic microbes)
- balanced C/N-ratio (35:1 to 25:1),
  if >40 ➔ degradation slows down
  if <20 ➔ increasing emissions of nitrogen
- self heating (sanitisation, heat removal, convection)
- formation of humic substances (stable organic compounds, quality of compost)

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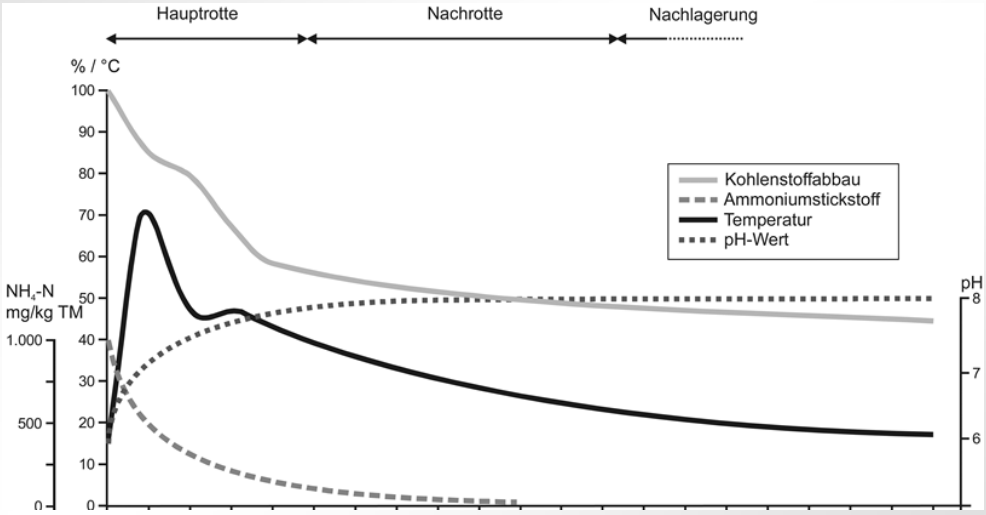
The Rotting Process



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intensive degradation phase

- outdoor (open) or indoor (closed)
- WC = 50 - 65 %WM, bulk density <600 kg/m^3,
- minimum turning interval is once per week with proper equipment ➔ **wheel loader is not proper!**
- aeration passive (convection) or active (forced)
- verification of sanitisation by time-temperature-regime
- table about dependence of windrow dimensions to turning intervals and duration of intensive phase
- constructive requirements (impermeable basis, leachate collection, …)

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Intensive Phase - Sanitisation

minimum temperature		duration
triangular windrows and table windrows (open, roofed or housed)		
turning is necessary during the phase of sanitisation	**55 °C**	minimum daily measurement of rotting temperatures; compliance of minimum temperatures including minimum **3 turning events** within a connected period of **10 days**
	60 °C	minimum daily measurement of rotting temperatures; compliance of minimum temperatures for **3 x 3 days** including **2 turning events** within a connected period of **14 days**
	65 °C	minimum daily measurement of rotting temperatures; compliance of minimum temperatures for **2 x 3 days** including **1 turning event** within a connected period of **14 days**
housed batch-technique (e.g.: box, tunnel, etc.)		
no turning is necessary during the phase of sanitisation	**55 °C**	continuous measurement of rotting temperatures (minimum hourly); compliance of minimum temperatures for **4 days** within a connected period of **7 days**
	65 °C	continuous measurement of rotting temperatures (minimum hourly); compliance of minimum temperatures for **3 days** within a connected period of **7 days**

13

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curing phase

- curing phase starts when temperatures (guide value) get lower 40-45 °C (short pass over after turning event is allowed)
- mostly use of open windrow technique
- duration minimum 4 weeks (even longer if necessary for the planned compost application)
  AT_4 < 7 mgO_2/g DM or self heating <30-35 °C)
- triangular windrows are preferred
- height <2.5 m (for extended curing up to 3.0 m)
- turning minimum every 14 days (4 we if extended curing)
- constructive requirements

14

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area for compost storage

- after declaration ➔ storage for „product“ compost (end of waste)
- storage without unfavourable changes of compost properties
- fleece or roofing may make sense
- avoiding heights >3 m
- biologically still active compost <15 mm is to be turned every 3-4 weeks

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rotting systems

- construction/waste-air collection: open ➔ enclosed
- aeration: passive (convection) ➔ active (forced), pressure ➔ suction), continuous ➔ discontinuous,
- type of windrow: triangular, table-/trapezoidal
- movement of windrows: static ➔ dynamic, frequent turning for all techniques is necessary
- operation: manually ➔ automatisised, regulated ➔ controlled

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Manual for Planning, Execution and Evaluation of Analysis of Biowastes

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Manual for Planning, Executing and Evaluating of Analyses of Biowastes

- **background**
  - standardisation of methods for examination of composition of biowastes
- **use cases**
  - impurities in a collection bin
  - impurities in a collection vehicle (collection tours in different settlement areas)
  - calculation of composition within a region (region, federal country, Austria, calculation of recycling quotas, ..)
  - monitoring of use of biodegradable plastics
  - ….

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Manual for Planning, Executing and Evaluating of Analyses of Biowastes

- **planning of analyses**
  - depending on posed question
- **manual defines regards for customer and execution**
  - specification of possible goasls of examination
  - catalogue of fractions to be sorted
  - designation of total sample amount (statistic requirements:
    - number of samples, mass of single samples,
    - access level (waste in, collection vehicle, delivered material)
    - handling of adhesions
    - estimation of e.g. types of plastics
  - evaluation of results

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Danke für Ihre Aufmerksamkeit

20