Compostaje de Materia Organica para Fertilizacion de Pistacheros

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Content:

- What is composting?
- What makes it so important?
- An overview of different composting solutions with a brief review of each
- Composting in Iran
- Our Composting plant with a brief description of the process and possible challenges
- Evaluation of using compost on annual crop yields in Pistachio orchards

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What is composting?

Composting is ART

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What makes it so important?

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Benefits of Humus

- High WHC that makes the soil more drought resistant
- Humus is light and fluffy, allowing the air to circulate easily
- Humus can improve the soil structure, as humus hold soil particles together in a desirable crumb structure
- Highly effective at holding mineral nutrients safe from being washed away in rain
- Its dark brown color, helps warm up cold soils in the spring

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An overview of different composting solutions with a brief review of each

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Open composting - Overview

- Windrows
  - Small
  - Large
    - Non-aerated
    - Aerated
- Table piles
  - Non aerated
  - aerated

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Open composting – Small windrows




Function

- Set up by loader (1-1.5 m high)
- No active aeration (natural chimney effect/ turning)
- Turned by windrow turner
- Composting time: 6-8 weeks
- Discharge by loader

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- Low investment cost
- Easy handling
- Good quality

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- Space requirement (open/paved area)
- Limited windrow dimensions (3 m x 1.5 m)
- Rain protection required (> 1,000 mm)

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Open composting – Large windrows




Function

- Set up by loader (up to 3 m high)
- No active aeration (natural chimney effect?/ turning)
- Turned by wheel loader/turner
- Composting time: 10-25 weeks
- Discharge by wheel loader

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- Low investment cost
- Low space requirement/large piles
- Simple technology
- No rain protection

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- Process control
- Oxygen (O_2) supply
- Turning rate
- Product quality
- Irrigation
- Odours/GHG emissions

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Closed composting - Overview

- Covered
  - Fleece
  - Membrane
  - Sheltered roof building
- Closed
  - Hall
  - Garage
  - Tunnel
  - Container
  - Trommel

Closed composting – Fleece covered




Function

- Handling like open windrow composting
- Covering windrows with fleece for rain protection
- No active aeration required for air exchange

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- Rain protection
- Protection against birds
- Protection against dehydration

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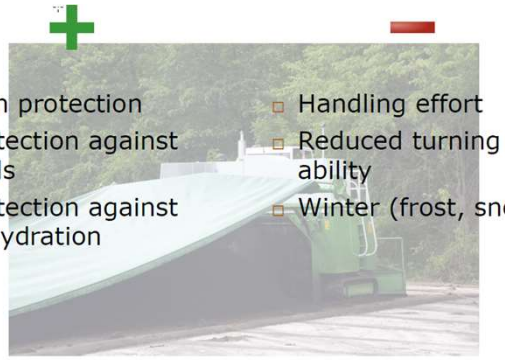
- Handling effort
- Reduced turning ability
- Winter (frost, snow)



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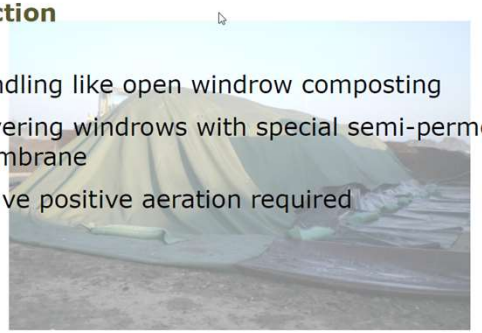
Closed composting – Membrane covered

Function

- Handling like open windrow composting
- Covering windrows with special semi-permeable membrane
- Active positive aeration required



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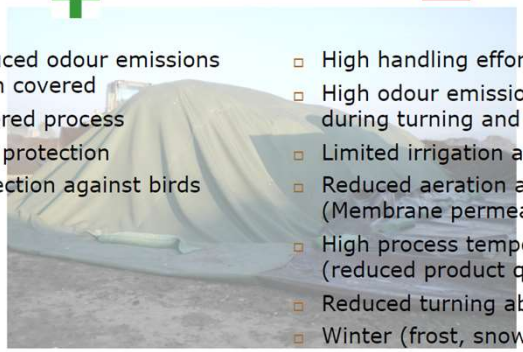
- Reduced odour emissions when covered
- Covered process
- Rain protection
- Protection against birds



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- High handling effort
- High odour emissions during turning and handling
- Limited irrigation ability
- Reduced aeration ability (Membrane permeability)
- High process temperatures (reduced product quality)
- Reduced turning ability
- Winter (frost, snow)

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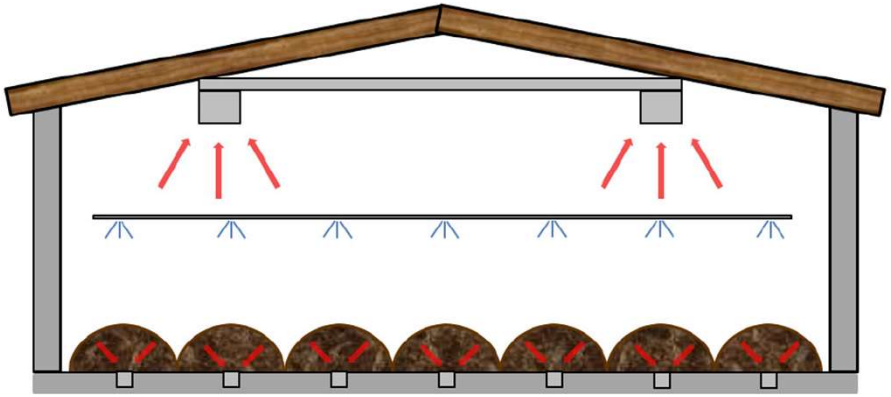
Closed composting – Hall



Function

- Filled by wheel loader/conveyor
- Active negative aeration
- Building ventilation
- Turning by turner
- Irrigation
- Discharged by wheel loader/conveyor

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- No uncontrolled odour emissions
- Controlled composting process/ sanitisation
- Little space required

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- Installation cost
- Operation cost
- Maintenance

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Composting in Iran

Our Composting plant with a brief description of the process and possible challenges

- **Established in 2015**
- **Composting solution: Aerated static pile (ASP) composting**
- **Location: Qazvin, Iran**
- **Production: 25000 Tons/year**
- **Required raw material: 55000 Tons/year of Green residuals**
- **Site area: 10 has**

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Raw material storage and Mixing area

Heaps (1 to 4)

Heaps (5 to 8)

Exp. Heap (1 and 2)

Screen area

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Inside the Heap

Behind the Heap

Behind the Heap

Behind the Heap

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Making a row of raw material

Mixing with turner

Filling the heap

Covering the heap with membrane

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Uncovering the heap

Heap depletion

Loading the truck to transport to screen area

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screening

screening

Loading and dispatch to orchard

Evaluation of using compost on annual crop yields in Pistachio orchards

- **Scenario 1: without Fertilization**
- **Scenario 2: cattle manure (30 Tons/has)**
- **Scenario 3: cattle manure (30 Tons/has) + Humic acid (45 Kg/has)**
- **Scenario 4: compost (30 Tons/has)**
- **Research duration: 3 Years**
- **Location: Green Tat orchard (Nazari Investment Group)**

In-furrow fertilization

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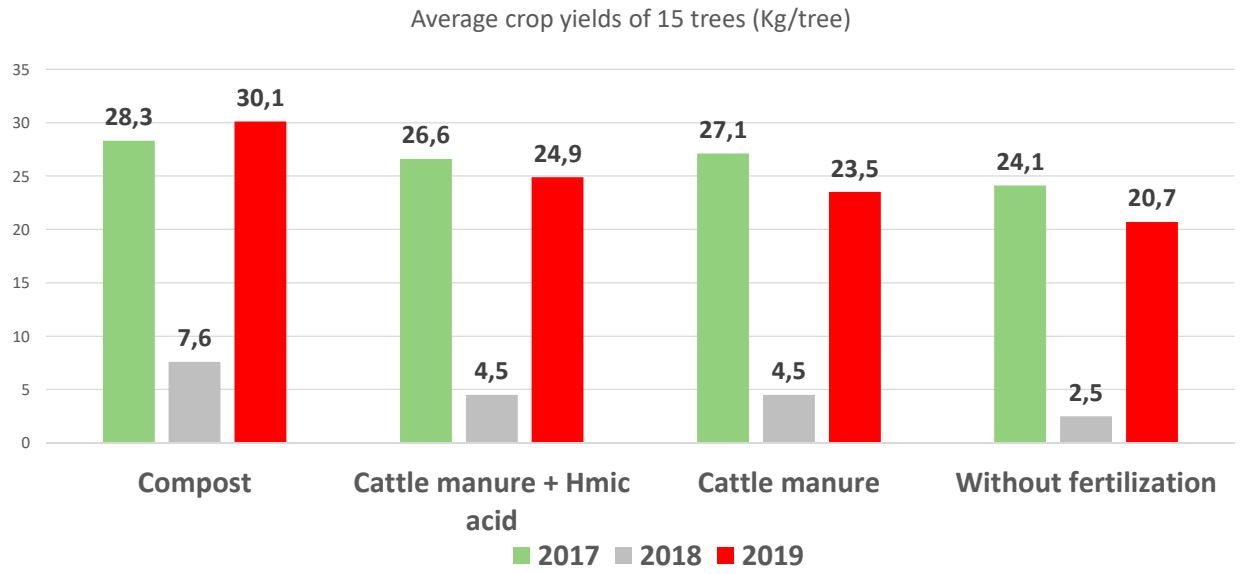
Average crop yields of 15 trees (Kg/tree)
35
30
25
20
15
10
5
0
28,3
7,6
30,1
26,6
4,5
24,9
27,1
4,5
23,5
24,1
2,5
20,7
Compost
Cattle manure + Hmic acid
Cattle manure
Without fertilization
2017
2018
2019

Saving Planet for Next Generation !

Thanks for your attention !

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