Suspended Solids in and Turbidity of Runoff from Green Roofs

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Outline

- Introduction – Why?
- Materials and Methods – How?
- Results – What?
- Summary – What now?
Introduction
Materials and Methods

- Growing media
- Water
- Vegetation
- Light
## Growing Media

<table>
<thead>
<tr>
<th>Media</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkalyte</td>
<td>Clay heated to 1000 °C</td>
</tr>
<tr>
<td>Bottom ash</td>
<td>Ash from coal power plant</td>
</tr>
<tr>
<td>Haydite</td>
<td>Shale heated to 1000 °C</td>
</tr>
<tr>
<td>Lava</td>
<td>Volcanic rock</td>
</tr>
</tbody>
</table>
Water
Initial Results – Water Source

The graph shows the mean value for TSS (mg/L) and Turbidity (NTU) across different trials. The results indicate variations in water quality from different sources:

- **Trial 1**: The highest value for TSS and Turbidity, with the green bars representing rainwater being notably high.
- **Trial 2**: Moderate TSS and Turbidity levels, with both rain and distilled water showing significant variation.
- **Trial 3**: Lower TSS and Turbidity values, with rainwater showing a decrease compared to Trial 1.

The graph uses different letters to denote significant differences among the trials, helping to identify which sources have statistically significant impacts on water quality.
Vegetation
Light
Initial Results – Growing Media

TSS

Mean Values for TSS, mg/L

Growing Medium

- Lava-NB
- Lava-B
- Hay-NB
- Hay-B
- Ark-NB
- Ark-B
- BotAsh-NB
- BotAsh-B

Trial-1
Trial-2
Trial-3
Initial Results – Growing Media Turbidity

Mean Values of Turbidity, NTU

Growing Medium

Lava-NB  Lava-B  Hay-NB  Hay-B  Ark-NB  Ark-B  BotAsh-NB  BotAsh-B

280 NTU
Initial Results – Vegetated Media TSS

Mean Value of TSS, mg/L

Growing Media

Lava  Haydite  Arkalyte  Bottom Ash

Trial 1  Trial 2  Trial 3

20 mg/L
Initial Results – Vegetated Media Turbidity

- **Lava**: 280 NTU (Trial 1)
- **Haydite**: 150 NTU (Trial 1)
- **Arkalyte**: 50 NTU (Trial 1)
- **Bottom Ash**: 30 NTU (Trial 1)

The graph shows the mean value of turbidity in NTU for different growing media. The horizontal line at 280 NTU indicates the threshold for the initial results.
Initial Results – Turbidity vs. TSS

\[ y = 0.8911x + 0.943 \]

\[ R^2 = 0.8894 \]
Initial Results – Effects of Color

Bottom Ash Non-blended

Lava Non-blended
Initial Results – Effects of Color

Bottom Ash
\[ y = 1.0902x + 0.6723 \]
\[ R^2 = 0.9125 \]

Lava
\[ y = 1.1217x + 0.0291 \]
\[ R^2 = 0.9695 \]
Summary

- TSS and turbidity of the growing media decrease over time
- TSS and turbidity vary between media
- The relationship between TSS and turbidity varies with the media and composition of growing medium
Questions?

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