FACT SHEET No.11 MM vs PERLITE/ZEOLITE

mineral magic

Making soils better & wetter - permanently

Mineral Magic vs Perlite and Zeolite

When comparing amorphous silica (Mineral Magic) to perlite and zeolite in the context of streetscape tree planting, several key benefits stand out:

1. Superior Water Retention and Release

- Amorphous Silica: Has a unique microscopic structure that enables it to retain water efficiently and release it slowly, making water more available to trees extended periods. This is particularly beneficial in streetscapes where consistent irrigation may be challenging.
- Perlite: While perlite is good for aeration, its retention capacity is limited compared to amorphous
- Zeolite: Zeolite also retains water but not to the extent of amorphous silica, which offers a more balanced water retention and release.

2. Enhanced Nutrient Retention and Availability

- Amorphous Silica: Negatively charged, it enhances nutrient retention and provides a superior cation exchange capacity (CEC), meaning it holds onto essential nutrients more effectively and makes them available to the tree roots.

Perlite: Has negligible nutrient retention capabilities, requiring more frequent fertilization to maintain nutrient levels.

Zeolite: Has good nutrient retention due to its CEC, but amorphous silica typically provides a better balance of nutrient availability.

3. Improved Root Development and Tree Health

Amorphous Silica: Encourages deeper and more robust root systems, which are crucial for trees in urban environments where soil conditions are often compacted or poor.

Perlite: While it aids in soil aeration, it doesn't contribute directly to root health or development.

Zeolite: Can improve root development by retaining nutrients, but does not provide the same level of enhancement seen with amorphous silica.

4. Pest and Disease Resistance

Amorphous Silica: Releases plant-available silicon, which has been shown to strengthen plant cell walls, making trees more resistant to pests and diseases—a critical factor in streetscapes where trees are exposed to various stressors.

Perlite: Does not contribute to pest or disease resistance.

Zeolite: While beneficial for soil health, it does not offer the same level of disease resistance as amorphous silica.

5. Longevity and Sustainability

- Amorphous Silica: Is a permanent soil amendment that does not break down over time, providing long-term benefits for the soil and trees without the need for reapplication.
- Perlite: Tends to float to the surface and can break down over time, losing its effectiveness.
- Zeolite: While stable, it may not provide the same lasting impact on soil structure and health as amorphous silica.

6. Environmental Impact

- Amorphous Silica: **Certified organic** and environmentally friendly, it supports sustainable urban landscaping by reducing the need for chemical fertilizers and frequent watering.
  The carbon footprint to mine our amorphous silica comes in at a paltry 88kg Co@ / tonne whereas Perlite and Zeolite are close to 1 tonne Co2 per tonne of product .

- Perlite: Requires energy-intensive processing and does not contribute to long-term soil health.
- Zeolite: Is naturally occurring but may require more intensive extraction processes, and its benefits are more short-term compared to the enduring effects of amorphous silica.

In summary, Mineral Magic (amorphous silica) offers a more comprehensive suite of benefits for streetscape tree planting, particularly in water retention, nutrient availability, root development, and long-term sustainability, making it a superior choice over perlite and zeolite.