
Sustainable
agriculture
&
Foliar fertilizer



Syria: Cereals (wheat, barley); Olives and olive oil; Vegetables (**tomatoes**, cucumbers, onions, etc.), **potatoes** and Fruit: citrus fruits, apples, grapes Sugar beet, tobacco

Nigeria: Root crops (Cassava, yams, sweet potatoes); Cereals (**maize, rice**, millet); Oilseeds/legumes (soya beans, groundnuts, sesame (including for export), beans); Fruit/vegetables (e.g. **tomatoes**), **bananas** Cocoa beans; Sesame seeds, Cashew nuts

Angola/Mozambique: **Cassava** (a staple food); **Maize; Bananas** (Angola is one of Africa's major producers); Beans, sweet potatoes, potatoes

UMID Colombia S.A.S. Whatever we do changes the world

great





remarkable

agricultural

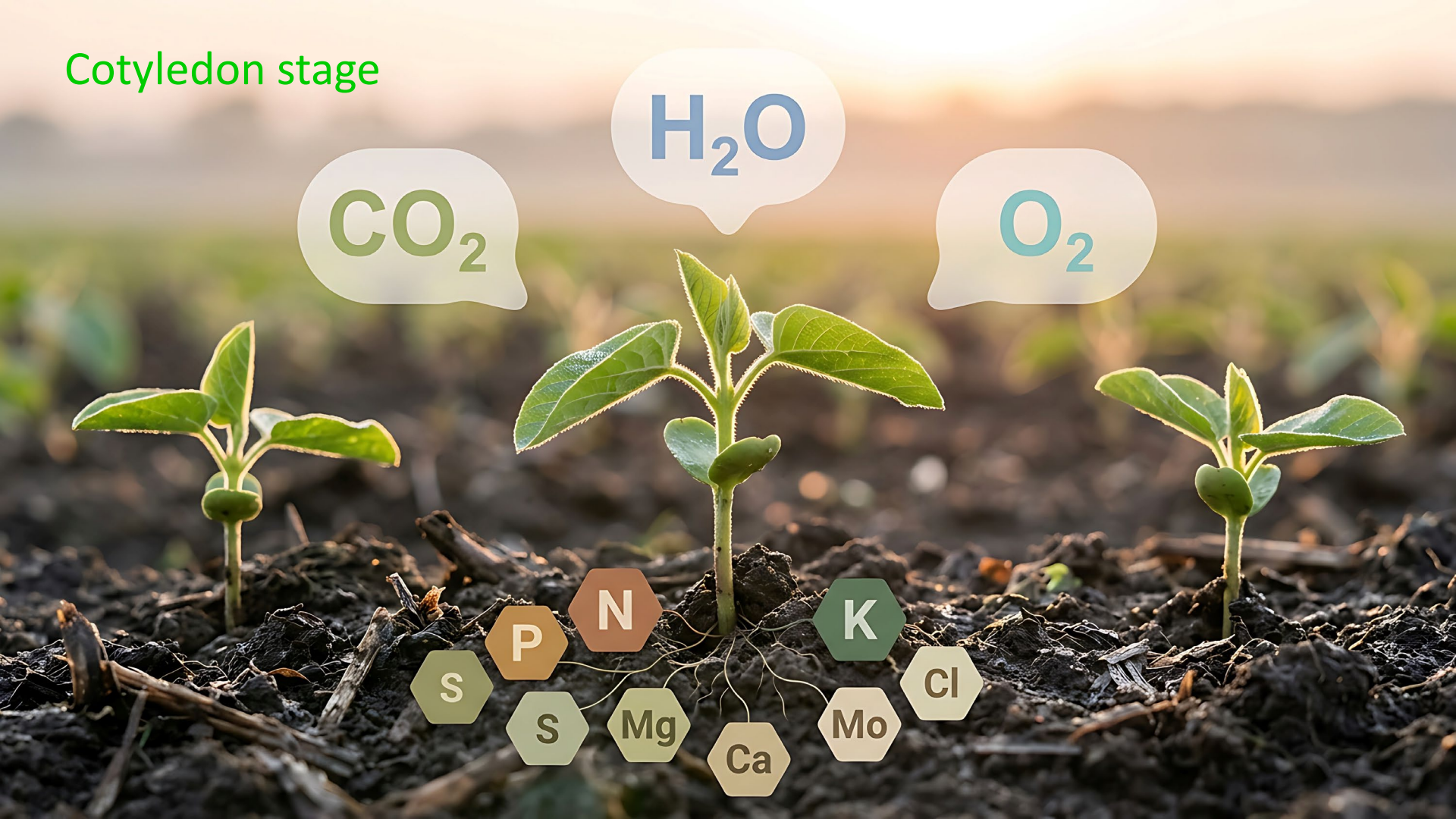
products



people



Cotyledon stage





- Where should one focus one's attention?
- Have the key points been considered?
- How else can I help my plants?
- What else should I bear in mind?

LIEBIG'S „LAW OF THE MINIMUM"

states that the growth or yield of an organism (e.g., a crop) is limited by the single essential factor that is in shortest supply relative to its requirement—no matter how abundant other factors are.

Water level stands for Biomass and Yield

Hydrogen

Carbon (CO_2)

Oxygen

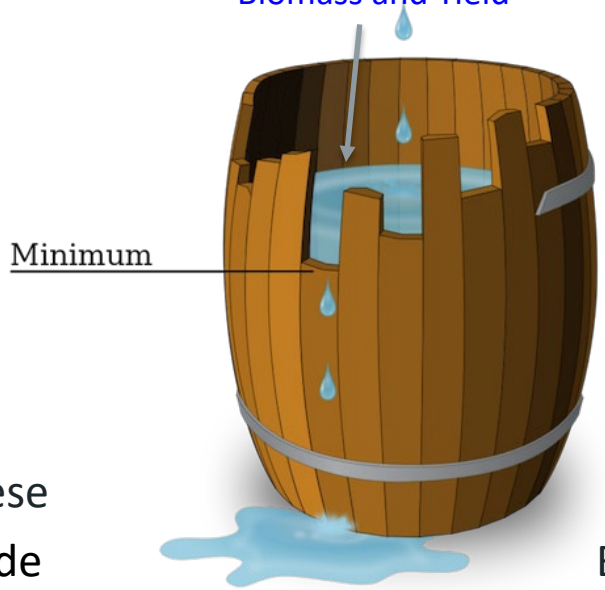
Nickel

Molybdenum

Magnesium

Manganese

Chloride



Nitrogen

Phosphorus

Potassium

Calcium

Magnesium

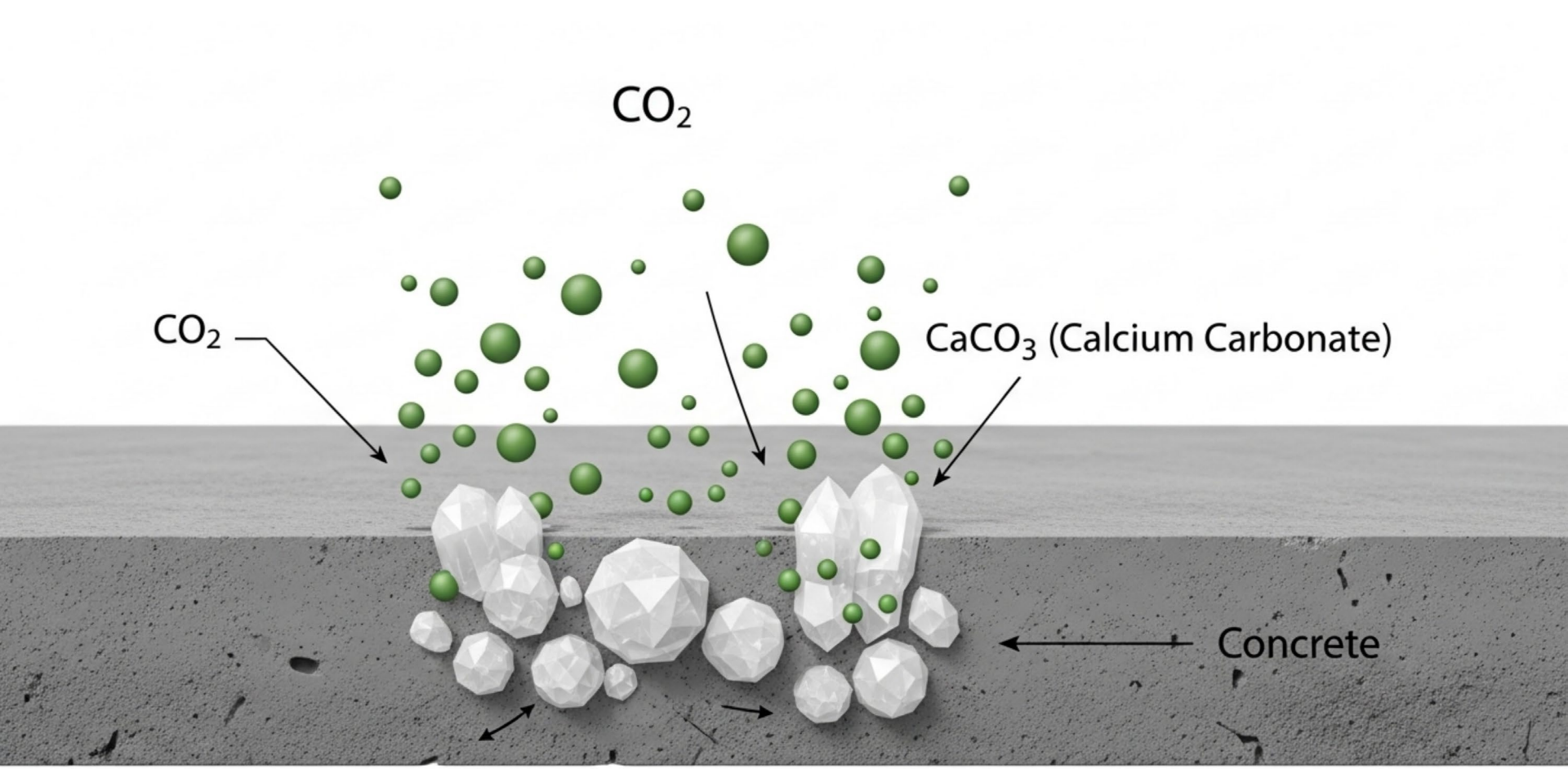
Sulfur

Iron

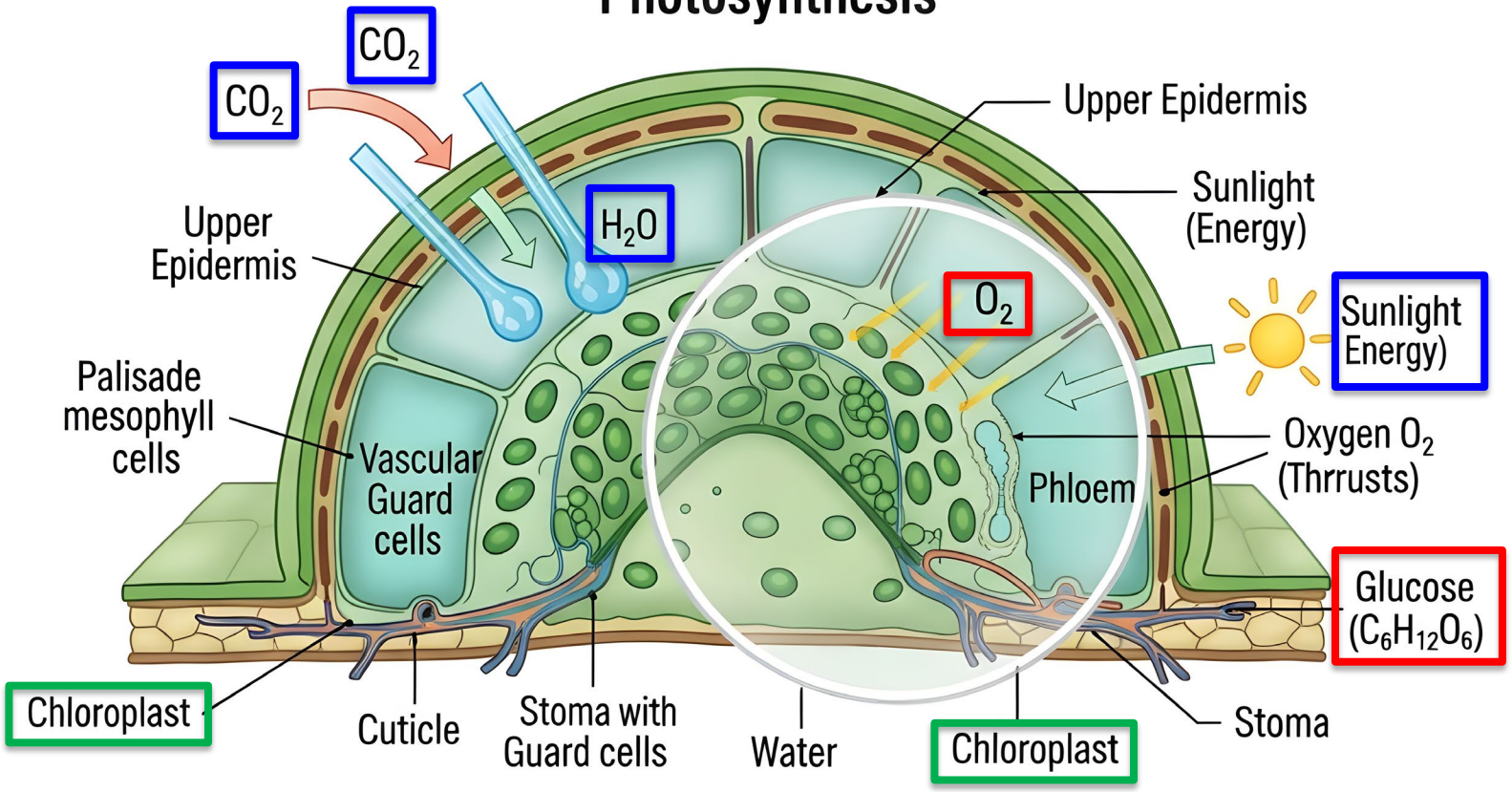
Boron


CO_2
O_2
H_2O
$C_6H_{12}O_6$


600-1000 ppm CO_2


CO_2
CO_2
$CaCO_3$ (Calcium Carbonate)
Concrete

Photosynthesis



$$6\,CO_2 + 6\,H_2O + light \rightarrow C_6H_{12}O_6 + 6\,O_2$$

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15–60 µm
often 100–400
stomata per mm²

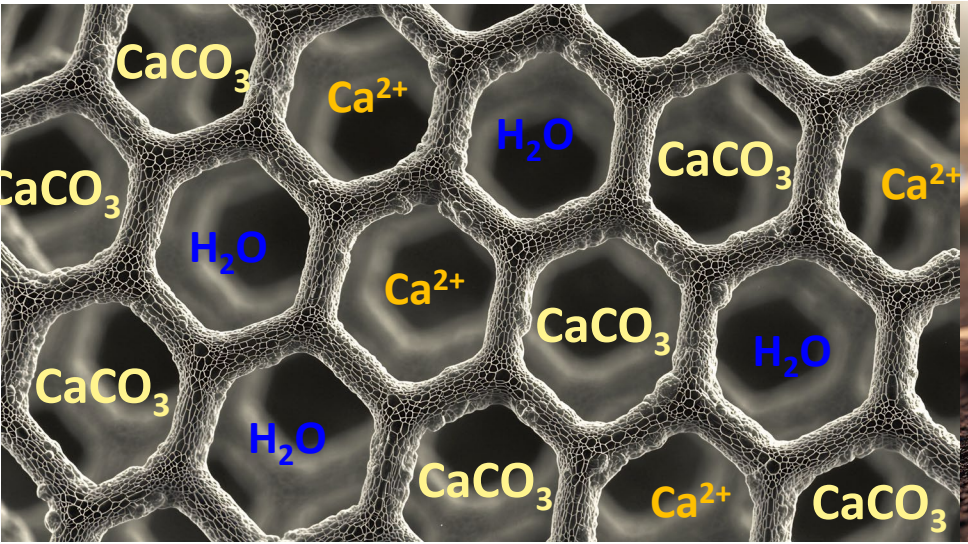
What would make the perfect carrier?

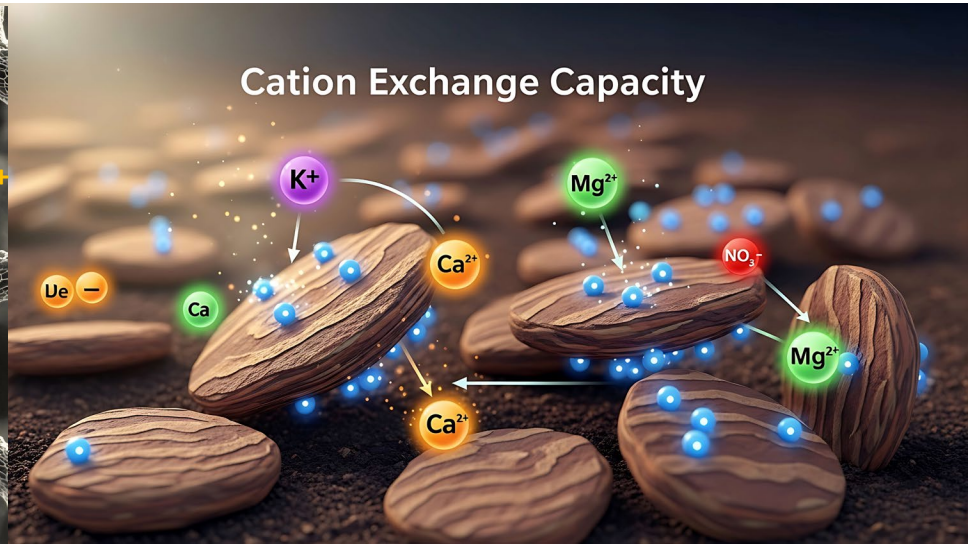


- ✓ Uniform: angstrom-scale channels/cages (molecular sieving).
- ✓ High cation-exchange capacity (CEC): from the negative framework charge.
- ✓ Strong: thermally stable crystals that reversibly adsorb/desorb water and other small molecules.
- ✓ Clinoptilolite: Natural zeolite, common in tuffs and volcanic ash deposits

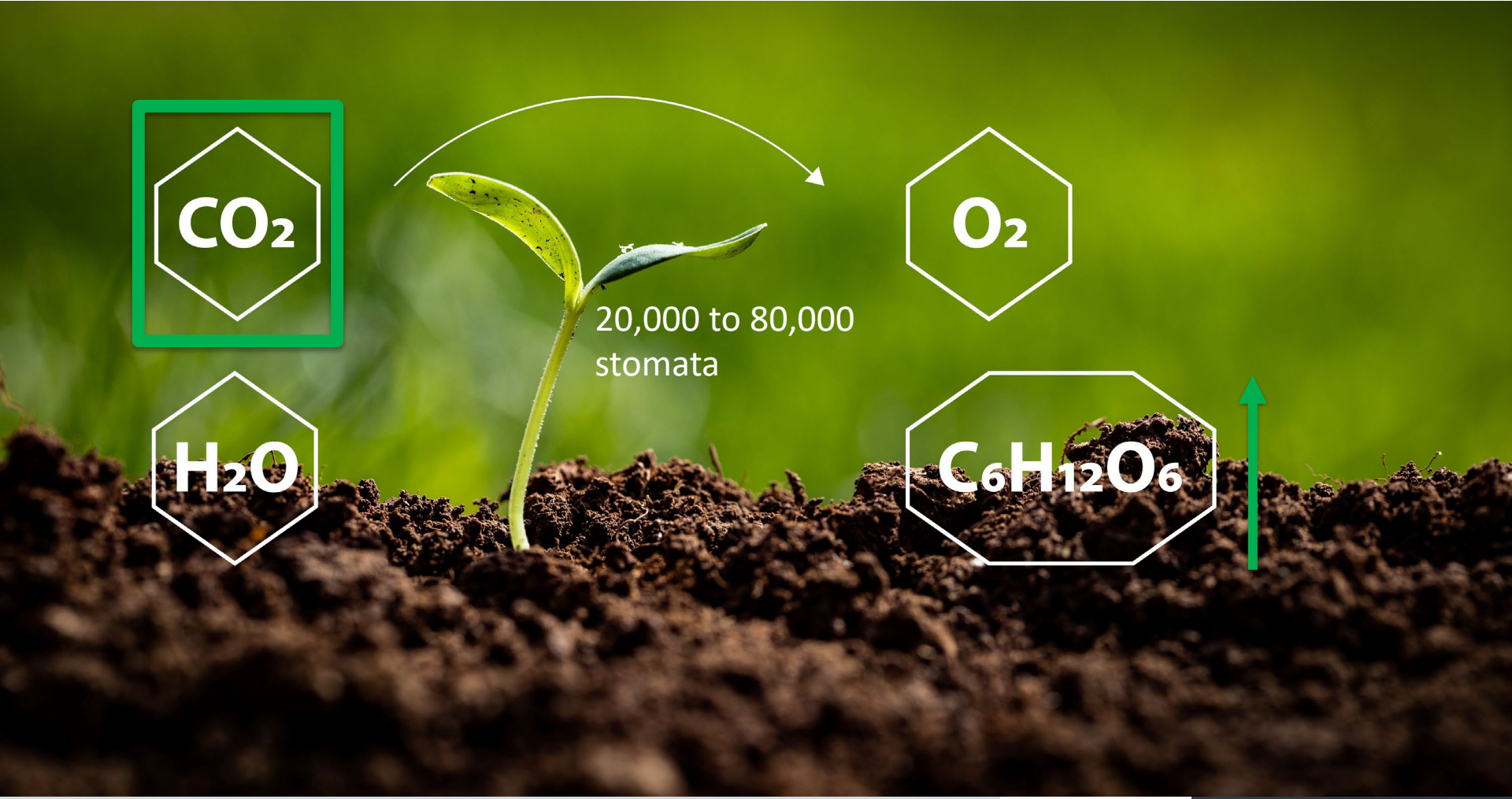
Zeolite

$$CaCO_3 + 2\,H^+ \rightarrow Ca^{2+} + CO_2\uparrow + H_2O$$





Strengths: **slow-release fertilizers**/soil conditioners, animal feed additives, aquaculture filters


CO_2
O_2
20,000 to 80,000
stomata
H_2O
$C_6H_{12}O_6$


THEORY &
PRACTICE

Air2Air Technology: uniform granulation of Calcite without contamination



enriched with zeolite

0,1 – 30 µm





fine mist!

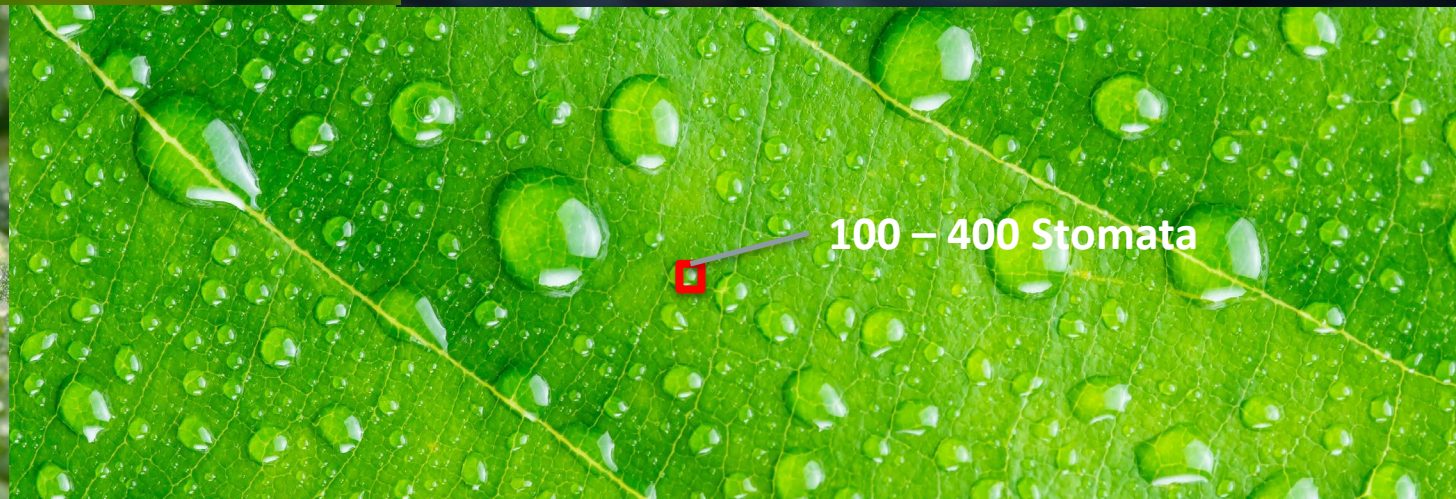




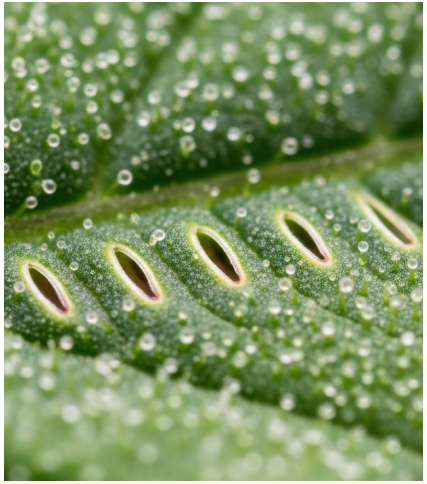

loss of product and efficiency






100 – 400 Stomata

STOMATAL NEWS



1. stomatal positions: Adaxial = upper surface; abaxial = lower surface.
2. Stomatal placement types:
   - Hypostomatous: mostly/only on lower surface.
   - Amphistomatous: on both surfaces.
   - Epistomatous: mostly/only on upper surface.
   - Astomatous: essentially none (common in fully submerged leaves).

Key points

1. Whether stomata occur on one or both sides relates to leaf anatomy, light environment, water stress, and habitat.
2. Even within a species, stomatal density and exact distribution can shift with environment (sun/shade, humidity, CO2, development stage).

studies and field trials





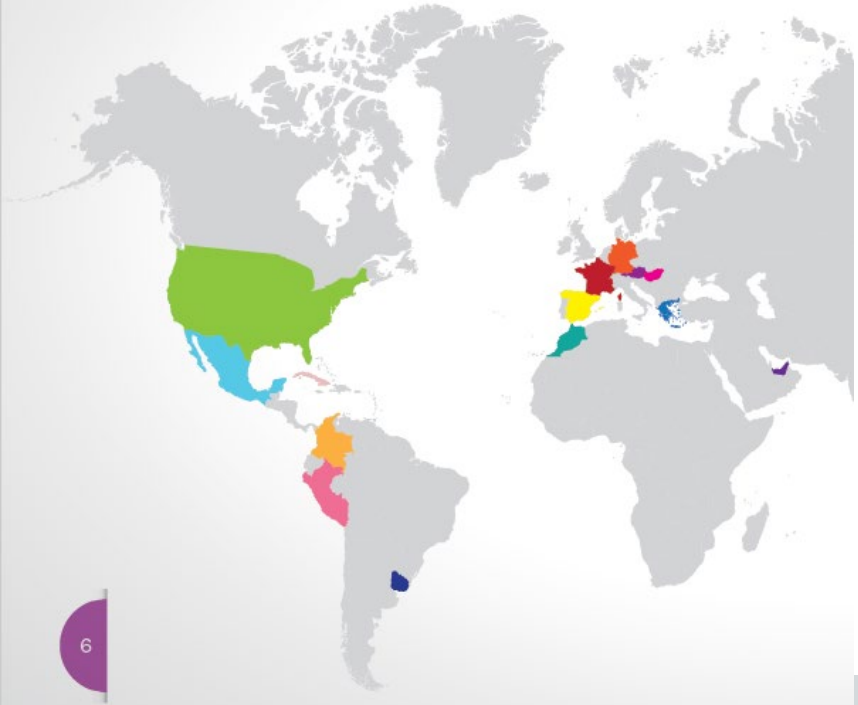
Nuestra Experiencia

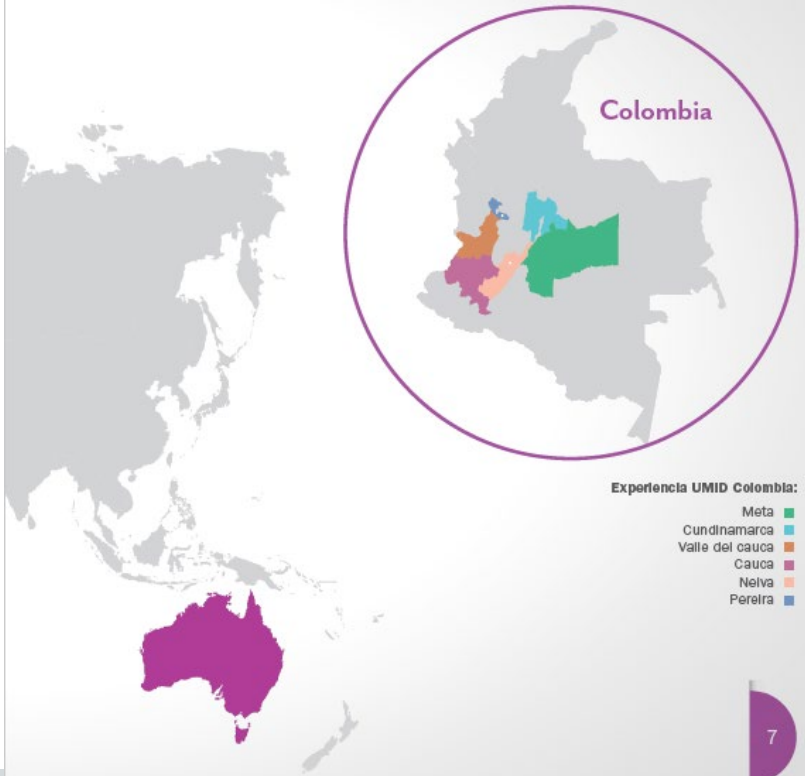
Con productos idénticos tenemos experiencias en:

- Austria
- Alemania
- Francia
- España
- Grecia
- Perú
- Uruguay
- Cuba
- México
- Colombia

Experiencia con productos similares
(Calcio magnesio como acondicionadores de CO_2) en:

- Marruecos
- Hungría
- Australia
- Estados Unidos
- Dubái





Experiencia UMID Colombia:

- Meta
- Cundinamarca
- Valle del cauca
- Cauca
- Nelva
- Pereira

Pineapple



With the aid of a carbon source the crop:

- was 9.8 times more productive
- exceed the average rate of normal growth by a factor of 10
- fortified about a 32 % increase of the root growth



Coffee



With the aid of a carbon source the crop:

- showed a **64% increase** in growth compared with the control coffee without carbon source

With just four applications the coffee was ready to be harvest two months before the normal harvest season.



25% time saving

