

MODIFIED ATMOSPHERE PROTECTION (MAP) FOR

Agricultural Seed Preservation

Protecting what grows your future

Modified Atmosphere Packaging (MAP) combines hermetic packaging with a controlled atmosphere containing very low oxygen levels. This creates optimal storage conditions that help preserve seed quality over extended periods by:

- Maintaining a stable moisture content
- Preventing oxygen-induced deterioration
- Protecting against insect infestation
- Reducing the effects of environmental fluctuations
- Extending storage life while preserving germination performance

Critical Factors for Seed Preservation

1. Moisture Content

For most seed types, moisture content is by far the most critical factor determining storage life.

As a general rule: the lower the seed moisture content, the longer the seed can be stored. However, for many larger seeds there is also a minimum safe moisture content below which damage may occur. Therefore, achieving the correct moisture level before storage is essential.

Unlike conventional packaging, hermetically sealed MAP systems prevent moisture exchange with the surrounding environment. As a result, seed moisture remains constant throughout the entire storage period.

Important: Because MAP maintains the moisture level throughout storage, seeds should first be conditioned to their optimal moisture content before hermetic packaging and gas flushing.

2. Oxygen – The Hidden Cause of Seed Aging

While moisture management is widely recognized, the role of oxygen in seed deterioration is often underestimated. Extensive pioneering research by Prof. Steven Groot of Wageningen University & Research has demonstrated that oxidative processes play a major role in seed aging and loss of vigor. Oxygen can cause:

- DNA damage
- Protein oxidation
- Lipid peroxidation
- Cell membrane damage
- Mitochondrial membrane damage

High temperatures and elevated moisture levels significantly increase the rate of these oxidative processes.

MAP significantly lowers oxygen levels around the seed, thereby slowing oxidative reactions and reducing the rate of deterioration.

3. Insect Control Without Chemical Treatment

Insects can cause substantial damage during seed storage through feeding damage, weight loss, reduced germination, contamination and quality degradation.

Low-oxygen MAP environments prevent the development and survival of storage insects, reducing reliance on chemical treatments and fumigants.



STABLE MOISTURE
Maintains optimal moisture content throughout storage



LOW OXYGEN
Reduces oxidative deterioration and preserves viability



INSECT PROTECTION
Prevents insect infestation without chemicals



EXTENDED STORAGE LIFE
Better germination, higher yield, lower cost

vQM
Packaging

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