



ACF-ST: Scientifically Designed & Validated Seed Treatment

Introduction to Biological Seed Dressing

Seed dressings play a pivotal role in modern agriculture—particularly for farmers aiming to cut input costs, protect yield potential, and adopt more sustainable practices. Biological seed treatments, like ACF-ST, use live beneficial microbes to bolster seed germination and seedling health at the most critical growth stage. This translates to stronger stands, improved resilience, and better yield performance overall.

Why a Biological Seed Dressing?

The window between imbibition (when seeds begin to absorb moisture) and germination is short, but it's also a **make-or-break** moment for the crop. During this vulnerable phase, seeds are susceptible to soil-borne pathogens that can limit vigor or even destroy emerging seedlings. With **ACF-ST**, you seed the rhizosphere early, filling that ecological niche with robust *Bacillus* strains. By colonizing the seed and the immediate root zone from day one, ACF-ST helps crowd out pathogenic microbes, giving your emerging crop the best possible start.

ACF-ST Description

Product Form & Application

- **Formulation:** ACF-ST is provided as an **aqueous solution** for convenient use as a seed dressing.
- **Application Rate:** Typically **60–180 oz** per 1,000 lbs of seed (actual rate may vary by crop).
- **Active Bacteria:** ACF-ST contains ***Bacillus licheniformis*, *Bacillus subtilis*, and *Bacillus velezensis***—all in **spore form** for maximum shelf stability.
- **Shelf Life:** Up to **2 years** when stored per instructions.

Why These *Bacillus* Strains?

Each *Bacillus* species in ACF-ST has been selected for:

- **Biofertilization:** Improving availability of key nutrients (N, P, and more).
- **Phytohormone Production:** Enhancing root growth and overall vigor.

- **Hydrolytic Enzyme Synthesis:** Helping break down soil organics to free up nutrients and suppress pathogens.

Together, these strains create a favorable microbial environment around each seed, reinforcing growth from the moment germination begins.

Proven Stability & Composition

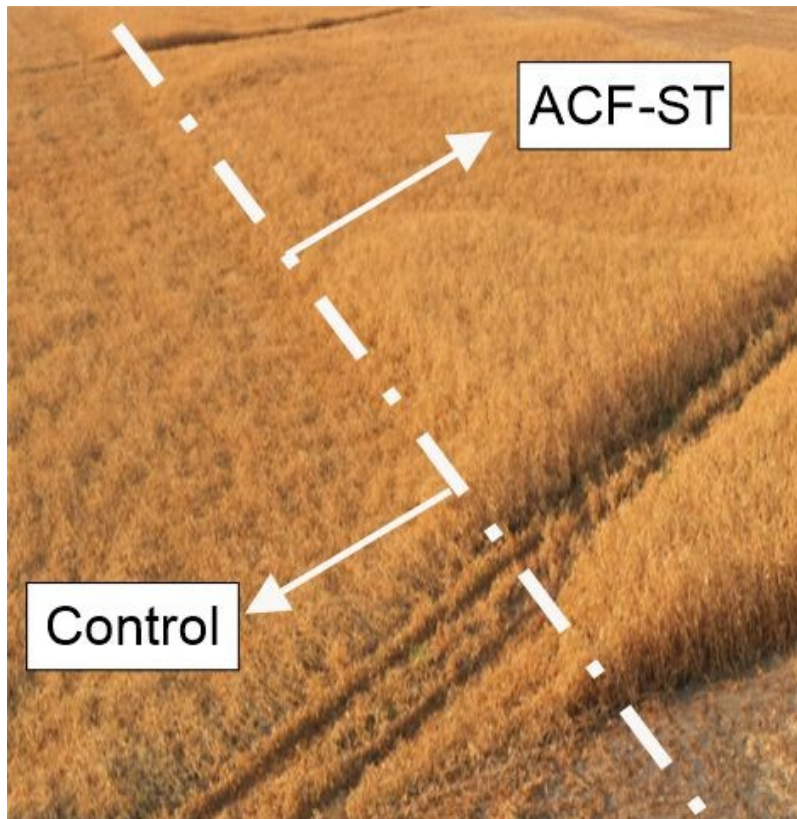
One major advantage for growers is **quality you can count on**. Through extensive lab analysis and real-world testing, we've confirmed that:

- **No Decline in Viability:** After 90 days of storage at both room temperature and **105°F**, our spore-count remains constant (no detectable drop in CFUs).
 - **Target Concentration:** Approximately **2.5×10^8 CFU/ml** at the time of packaging, maintaining consistent performance throughout the shelf life.
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What to Expect in the Field

1. **Faster Germination & Establishment**
By crowding out harmful microbes at the earliest stages, ACF-ST-treated seeds often emerge faster and more uniformly.
 2. **Higher Yield Potential**
In replicated trials, ACF-ST alone has demonstrated an average **7.5% yield increase**. When combined with our other products (**ACF-SR, ACF-SRP**), results are even more impressive.
 3. **Enhanced Stress Tolerance**
Whether it's early-season cold stress or mid-season drought, Bacillus species' biofertilization and growth-promoting abilities help your crop withstand challenges more effectively.
 4. **Reduced Disease Pressure**
The same microbial barrier that promotes growth also hinders the establishment of fungi and bacteria that cause seedling blights and root rots.
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Real-World Results: Split-Field Pea Trial



The photo shows a distinct boundary: on the “control” side, plants lagged behind; on the ACF-ST side, growth is more robust, denser, and healthier..

Yield Outcomes in this Project (Summer 2024)

- **Control:** 47 bu/acre
- **ACF-ST Treated:** 62 bu/acre

That’s a significant yield bump simply by treating the seed. These are the kind of results you can expect when the power of beneficial microbes is harnessed right from germination.

Third-Party Validation & Certificate of Analysis

At TLC, we don’t just tell you our product works—we show you **exactly what’s in it**. That’s why we partner with **Vermicon AG** (Munich, Germany), an ISO 9001-certified laboratory, to analyze and certify the bacterial composition and counts in our products.

Vermicon AG Certificate of Analysis Highlights

- **B. subtilis:** 1.67×10^8 CFU/ml
- **B. velezensis:** 8.64×10^7 CFU/ml

- **B. licheniformis:** 1.0×10^8 CFU/ml

These results confirm that you apply over 250,000,000 viable, ready-to-go spores **in every milliliter of ACF-ST**. We also know the **genetic capabilities** of each strain, including the genes tied to pathogen inhibition, nutrient cycling, and tolerance to stressful conditions (like drought). This transparency ensures you can trust the consistent quality of ACF-ST for your fields.

Why Farmers Choose ACF-ST

1. **Consistency & Accountability**
 - **Verifiable CFU Counts**
 - **Long Shelf Life & Thermal Stability**
 - **Independent Lab Certification**
 2. **Performance in the Field**
 - **Measurable Yield Gains**
 - **Enhanced Seedling Health**
 - **Less Disease, More Vigor**
 3. **Future-Proof Agriculture**
 - **Fits into IPM & Regenerative Ag Systems**
 - **Works Synergistically with Other Inputs**
 - **Environmentally Friendly & Farmer Approved**
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Ready to Try ACF-ST?

Whether you're battling unpredictable weather, looking to maximize returns, or simply want a more sustainable approach to farming, ACF-ST provides a **proven, scientifically validated** solution. By reinforcing your crop at its earliest stage, this seed treatment lays the foundation for a successful season—yielding stronger plants, higher profits, and peace of mind.

Certificate of Analysis (See Attached Next Page)

- Issued by **Vermicon AG**, October 2024
- Confirms CFU/mL counts for **B. subtilis**, **B. velezensis**, **B. licheniformis**
- Demonstrates accurate strain identity and concentration, matched to our stated specifications

Final Takeaway

ACF-ST is far more than just another seed dressing—it's a cornerstone of a **modern, biology-driven approach** to crop production. By harnessing the specialized traits of *Bacillus* spore-forming bacteria, you're giving your farm a robust, research-backed head start every season.



CERTIFICATE OF ANALYSIS

Product Information

Product Name ACF-ST
Batch ID 20241008ST
Date of Manufacture October 8, 2024

Amount of bacteria

Name	Viable cell count / mL*
<i>Bacillus subtilis</i>	1,69E+08
<i>Bacillus velezensis</i>	8,64E+07
<i>Bacillus licheniformis</i>	1,04E+08

*Analytical method: qFISH (quantitative Fluorescence in situ hybridization)

Tested by vermicon AG

Name	Signature	Title	Date
Dr. Claudia Beimfohr		Manager QC	13.12.2024