ABIOTIC STRESS IS THE FOREMOST CAUSE OF GLOBAL CROP LOSS

And climate change is increasing the frequency and severity of these stressors...

TOP STRESSORS

ABIOTIC STRESSORS:
• Drought
• Temperate extremes
• Soil salinization

BIOTIC STRESSORS:
• Pests
• Weeds

$17 Billion
2012 U.S. crop loss due to extreme weather[1]

$1.5 Billion
2014 direct loss from drought in California alone[2]
TRADITIONAL SOLUTIONS NOT WORKING, NEW SOLUTION FROM NATURE

TWO SOLUTIONS NOT WORKING:
1. Breeding traits from native plants
2. Genetic Modification

Industry spent $ billions on these “solutions”

FUNGAL ENDOPHYTES
Harvesting the most efficacious microorganisms from stress resistant plants
ADAPTIVE SYMBIOTIC TECHNOLOGIES
FARMER’S ANSWER TO MOTHER NATURE

**Harvest from Nature**
Fungal endophytes in native plant species growing in stressed conditions

**Analyze and Grow**
Fungal endophytes analyzed in greenhouse and grown in lab

**Solution for Farmers**
Formulated into an industry compatible liquid seed treatment for abiotic stress
Temperature Tolerance Conferred to Watermelon

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Uncolonized</th>
<th>Colonized</th>
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<tbody>
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<td>50</td>
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N = 12/temp, SD=0
BioEnsure Field Performance in High-Stress Growing Seasons

Average Corn Yield Increase under High Stress: +38.9 bu/ac (2,475 kg/ha)  
Win Rate: 93.3% (>5% yield increase)

Field Evaluations: 15  
Replications: 45  
Locations: 9  
States: CA, WA, MI, NE, MN, AZ, ND, Rajasthan  
Cooperators: Independent CRO’s, seed companies, farmers, universities  
Hybrids Tested: 6 commercial hybrids with Standard PPP’s

Water and/or Heat Stress

Yield Difference vs Checks (%)
If You Can’t Take the Mountain to Mohammed…

SECURING WATER FOR FOOD:
A GRAND CHALLENGE FOR DEVELOPMENT
BioEnsure Field Performance in India – Mung Beans

Field Evaluations: 45
Replications: 45
State: Rajasthan, India
Cooperators: farmers

Average Yield Increase: 250lb/ac (284 kg/ha)  Win Rate: 96.0%

Average 56% Increase
BioEnsure is Applied as a Seed Treatment
Low Cost Seed Treater
Female Empowerment Program
Opportunities

So that BioEnsure reaches the smallholder farmers who will benefit most, we are explicitly seeking relationships with:

– NGO’s – farmer and female empowerment focused
– Grant funding for scaling our program
Thank You

securingwaterforfood.org