

Microbial Soil Reclamation

Biodel AG

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Crop Production in the lower deserts is based on soil conditions and water supply as the essential inputs.

- Today, our water supply is the primary driver of value, while soil conditions are generally secondary.
- However, our desert soils are severely depleted – commonly less than 2% SOM, with most below 1%.
- Why are our soils in a depleted condition?

Management

Most suggest it is excessive tillage, or heavy fertilizer and chemical use.

Why Management?

- We simply lost sight of the value of soil function which is driven by the soils' microbial biomass. Soil Function/Microbial Biomass are the key:
 - Cycle Nutrients and Carbon
 - Significantly increase Water Holding Capacity and Water Use Efficiency
 - Displace some and potentially all of the NPK requirement
 - Prevents and/or Reduces Nutrient Runoff, Percolation, or Evaporation
 - Requires less Horsepower, Fuel and Labor for Tillage Operations
 - Reduces overall input costs while positioning AG Lands for the future sale of Carbon Credits



David C. Johnson, PhD, NMSU

Demonstrated that high yields could be achieved with microbial inputs alone.

Management and SOM Levels

How do we restore soil function?

- 1. Begin each crop cycle with microbial inoculation.**
 - Apply microbes and nutrient source to initiate nutrient cycling
- 2. Manage the Antagonists**
 - Shift NPK applications to a supplemental role later in the crop cycle
 - Phase down total NPK applications 30% annually over 3-4 crop cycles
 - Eliminate Fungicides and monitor compatibility of Herbicides
- 3. Use a Multi-Species Cover Crop**
 - A least once every 2-years. Key to NPK reduction.



Biodel AG Inc developed *Sequester*® to promote Microbial Soil Reclamation

- Sequester® drives the reclamation process to improve soil health and restore carbon and nutrient cycling.
- The Sequester formulation contains a proprietary blend of *Cyanobacteria strains* that are nitrogen-fixing, phosphate solubilizing, photosynthetic autotrophs. Sequester rapidly restores carbon and nutrient cycling and a primary energy source for fungal development.
- In addition, Sequester contains our patented extract from the Guayule Shrub, called *Isoprenoid Amino Complex*® (“IAC”) which is a potent plant biostimulant ingredient currently being used on over 1 million+ acres in the US, primarily on corn and soybeans.



Cyanobacteria in biotechnology

S. Dobretsov² and K. Sudesh³

Trends in Biosciences 12(1), Print : ISSN 0974-8431, 15-26, 2019

REVIEW PAPER

Cyanobacteria: Role in Agriculture- A Review

K. V. USHARANI AND DHANANJAY NAIK

Frontiers
Environmental Science

As a nitrogen-fixing photosynthetic Autotroph,
Cyanobacteria are nature's most powerful microbe for soil
reclamation.

PEER-REVIEWED RESEARCH

Cyanobacteria



Sequester[®]

Sequester[®]

BAM[™]

For the 2024 Crop Season, Bidel AG is introducing **BAM[™]** as a companion product to Sequester[®]
BAM[™] = Beneficial Aerobic Microbes, Fungal Dominant

Using Sequester/BAM to restore Soil Function:

1. Product is applied at planting (1st irrigation or in-furrow)
2. A second application is suggested post-emergence (2nd irrigation or Foliar)

The advantage of the Sequester/BAM combination is the process of microbial soil reclamation can be implemented in 1 - 2 years rather than 3-5 years. 1st Year NPK applications can be reduced 50% (Example: 250 lbs N less 50% = 125 lbs while P and K applications can be eliminated)..



Sequester[®]

BAM[™]

Microbial Soil Reclamation

Microbial Soil Reclamation for improved Water Use Efficiency

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