

# James McCollum





# **Waters Agricultural Laboratories, Inc.**

## **Analytical and Microbiological Services**

- Soil Testing
- Nematode Assays
- Plant Analysis
- Citrus, Peach, & Pecan Nutrient Program
- Pine/Hardwood Foliage Analysis
- Fertilizer Analysis
- Limestone and Gypsum Materials
- Feed Analysis
- Manure and Sludge Analysis
- Heavy Metal Analysis
- Microbiological Analysis
- Water Analysis
- Herbicide & Pesticide Residue Analysis
- Herbicide & Pesticide Analysis
- Aflatoxins and Mycotoxins
- Cotton Programs
- Onion Programs
- Golf Course Turf Management Program
- Precision Agricultural Mapping Services
- FieldAlytics/Agrian Mapping Services
- Research Analysis



# New Services Update

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- Plant SAP analysis
- Becrop Soil DNA analysis





MEASURES NUTRIENT  
CONCENTRATIONS  
AVAILABLE TO THE PLANT AT  
THE TIME OF SAMPLING.



ALLOWS YOU TO MONITOR  
NUTRIENT UPTAKE AND  
DETECT DEFICIENCIES  
BEFORE THEY BECOME  
VISIBLE.



MONITORING THE  
NUTRIENTS IN PLANT SAP  
PROVIDES IN-DEPTH,  
PRACTICAL INSIGHTS INTO  
THE FACTORS WHICH  
INFLUENCE NUTRIENT  
UPTAKE AT DIFFERENT  
STAGES OF GROWTH.





# Benefits of SAP Analysis

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- Faster results, in many cases the same day the sample arrives in the laboratory
- Early detection of nutritional deficiencies before crop performance is affected
- Reveals varietal differences in nutrient uptake
- Better fertilizer decisions in timing, placement and fertilizer type
- Savings due to proper fertilizer applications
- Reliable yield and quality – less deficiencies or imbalances, sustained growth
- Improved disease resistance of well-balanced crops
- An insight into growing conditions



Improving Growth with Science &  
Technology Since 1976

BIOME  
MAKERS



# DECODING DNA WITH MICROBIOME INTERACTIONS

## FOR SOIL HEALTH & SUSTAINABILITY

**Microbial Diversity**



**Disease Risks**



**Nutrient Cycling**

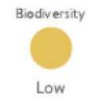


**Optimizing Inputs**



## Biome Summary

Soil Quality



Health



Nutrition



### Distribution

Fungal Phylum distribution

56.19% Ascomycota

39.72% Basidiomycota

3.74% Mortierellomycota

Bacterial Phylum distribution

25.01% Proteobacteria

19.08% Actinobacteriota

10.74% Verrucomicrobiota

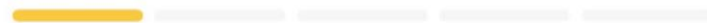
### Ranks



## Soil Quality

Soil Quality Value  
LOW

BIODIVERSITY



FUNCTIONALITY



RESISTANCE



# Health

HEALTH  
MEDIUM

4

Disease Risks found

Crop health according to the pathogens detected

## Slight Risk Detected



FUSARIUM DRY ROT



LOW Risk level



FUSARIUM ROT



LOW Risk level



FUSARIUM WILT



LOW Risk level

PINK MOLD

## Not Detected

ALBINISM • ALTERNARIA BROWN SPOT • ALTERNARIA ROT • ANTHRACNOSE • AREOLATE LEAF SPOT • BLACK MOLD ROT • BLACK ROOT ROT • BLUE MOLD • BOT GUMMOSIS • BOTRYTIS BLOSSOM AND TWIG BLIGHT • BROWN ROT • BROWN WOOD ROT • CHARCOAL ROOT ROT • CITRUS BACTERIAL SPOT • CITRUS BACTERIAL BLAST • CITRUS BLACK PIT • CITRUS BLIGHT DISEASE • CITRUS CANKER • CITRUS KNOT DISEASE • CITRUS VARIEGATED CHLOROSIS • DAMPING-OFF • DIPLODIA STEM-END ROT • DOTHIORELLA GUMMOSIS • DRY ROT • FLYSPECK • FOOT ROT AND GUMMOSIS • GRAY MOLD • GREASY SPOT • GREEN MOLD • HEART ROT • MAL SECCO • MANCHA FOLIAR • MELANOSE • MUCOR FRUIT ROT • MUSHROOM ROOT ROT • PHOMOPSIS STEM-END ROT • PLEOSPORA ROT • PORIA ROOT ROT • POSTBLOOM FRUIT DROP • PSEUDOCERCOSPORA LEAF AND FRUIT SPOT • RHIZOPUS SOFT ROT • RIO GRANDE GUMMOSIS • ROOTLET ROT • ROSELLINIA ROOT ROT • SCAB • SEPTORIA SPOT • SOOTY BLOTCH OF CITRUS • SOUR ROT • TEXAS ROOT ROT • USTULINA ROOT ROT • WHISKER MOLD • WHITE MOLD • WHITE ROOT ROT • WHITE WOOD ROT

## Biocontrol

FUNGICIDE AGENTS VERY HIGH

INSECTICIDE AGENTS MEDIUM

BACTERICIDE AGENTS NOT DETECTED

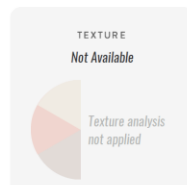
NEMATOCIDE AGENTS MEDIUM



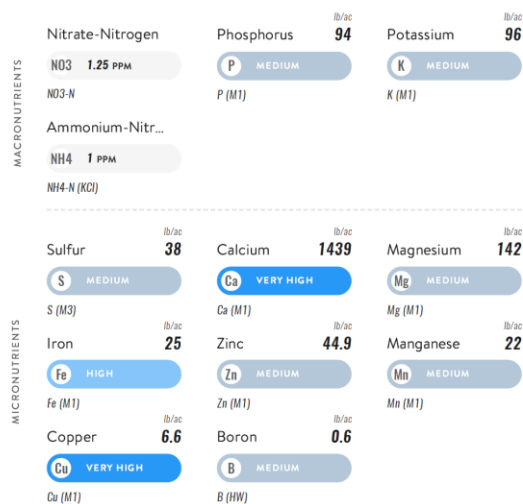


## CHEMICAL FERTILITY RATINGS 4

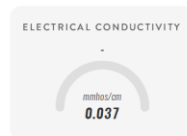
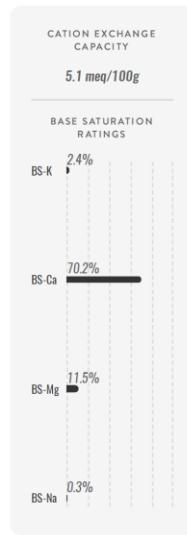
## General Insights



## Extractable Elements



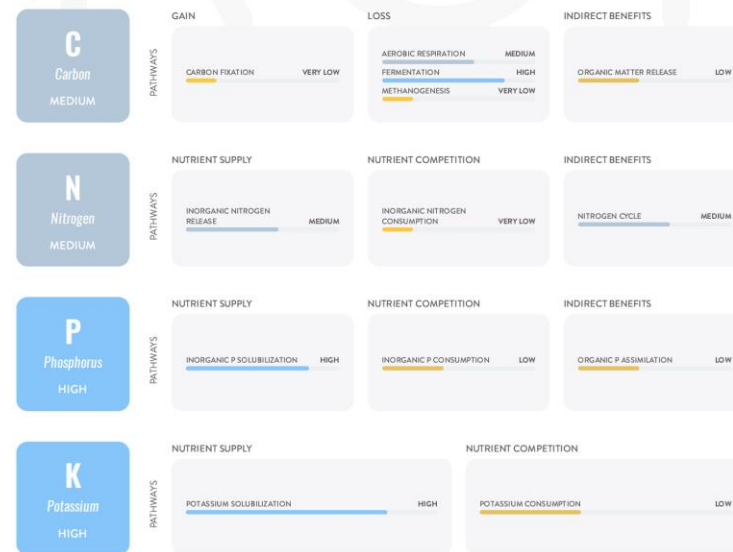
## Detrimental Elements



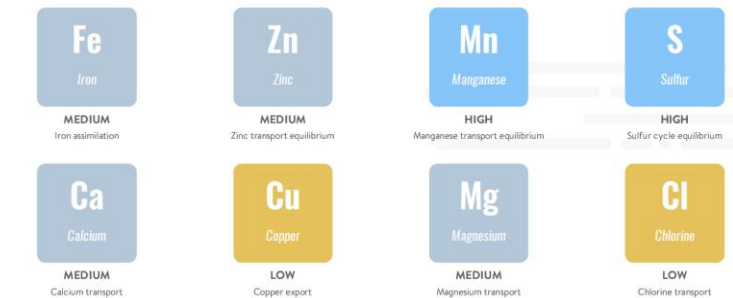
## NUTRITION

Nutritional status based on the microbial mobilization of certain compounds

## Major Compounds



## Minor Compounds



## Contact Information

James McCollum

Cell: (662)822-8724

Office: (601)429-6456

Email: [jamesm@watersag.com](mailto:jamesm@watersag.com)