

Industry Survey on Micronutrients

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Methods Forum
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What company (or companies) do you represent?

Yara North America, Inc.

Nutrien (PCS and Agrium Inc.)

U.S. Borax (Rio Tinto)

Andersons

Koch Ag & Energy Services and subsidiaries

Bio Huma Netics

Tessenderlo Kerley, Inc.

Old Bridge Chemicals, Inc.

Nutrient Agri Products - Zinc Nacional, Prince

Erachem, Quimag,

Thornton Laboratories

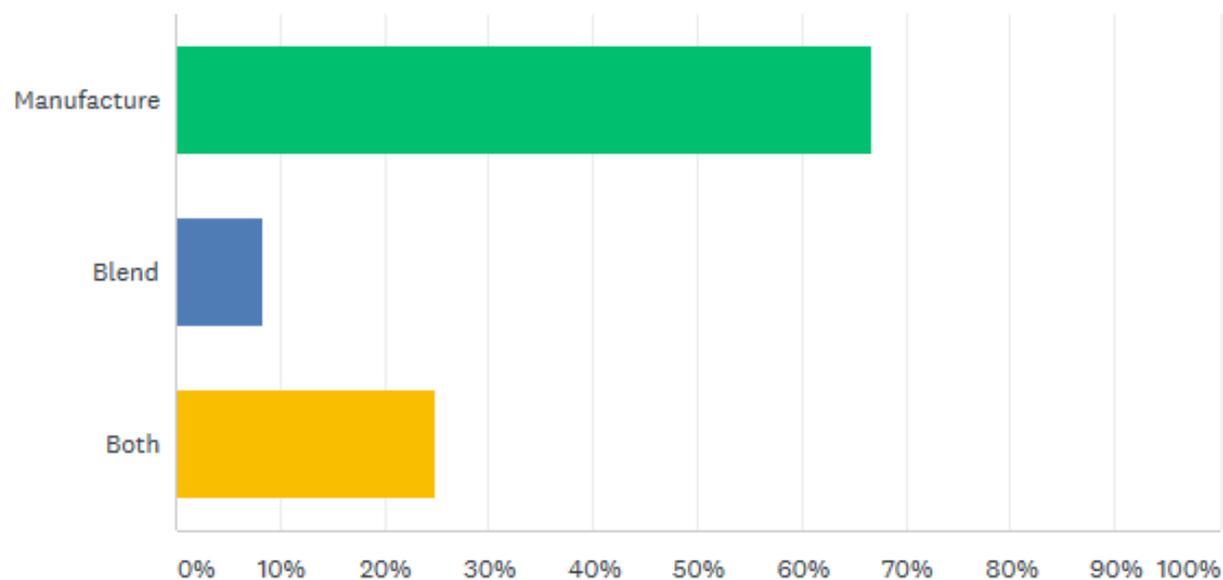
Advanced Micronutrient Products

Frit Industries, Inc

Anuvia Plant Nutrients

Does your company manufacture or blend materials?

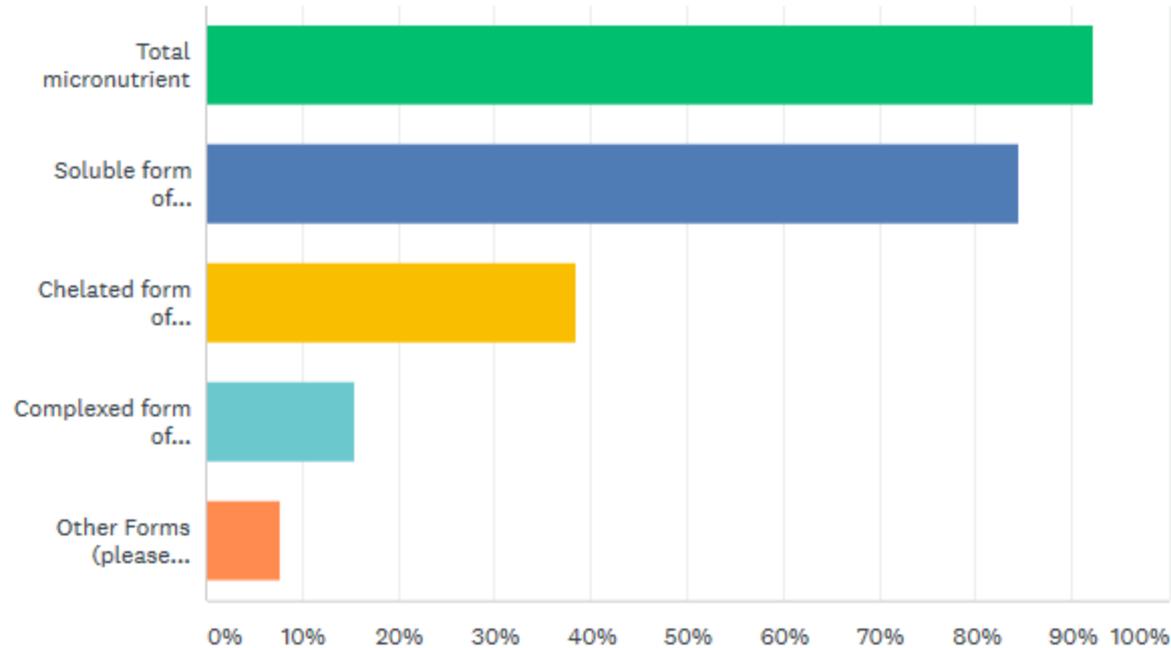
Answered: 12 Skipped: 1



ANSWER CHOICES ▼	RESPONSES ▼
▼ Manufacture	66.67% 8
▼ Blend	8.33% 1
▼ Both	25.00% 3
TOTAL	12

Check the micronutrient guarantees applied to your fertilizer products.

Answered: 13 Skipped: 0



ANSWER CHOICES	RESPONSES
▼ Total micronutrient	92.31% 12
▼ Soluble form of micronutrient	84.62% 11
▼ Chelated form of micronutrient	38.46% 5
▼ Complexed form of micronutrient	15.38% 2
▼ Other Forms (please specify)	Responses 7.69% 1
Total Respondents: 13	

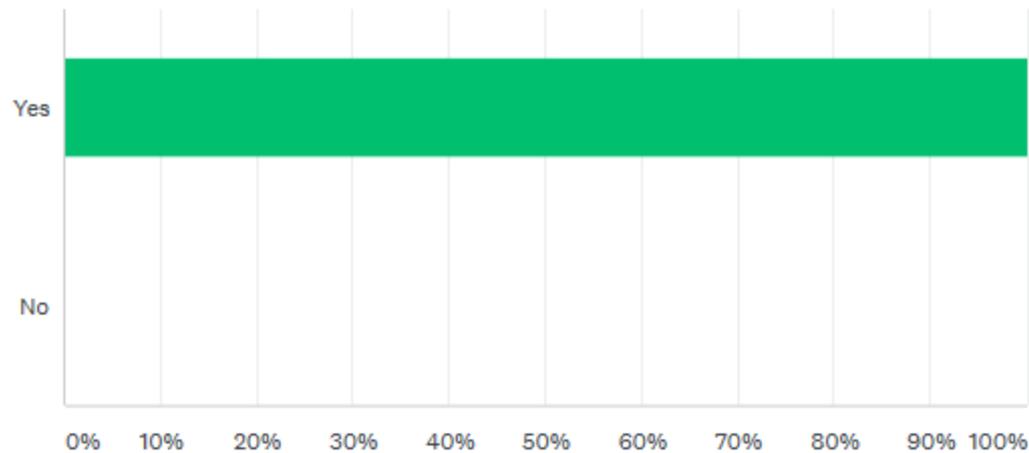
Q4

Customize

Save As ▼

Does your company make references to soluble or available micronutrients on the label or in marketing information?

Answered: 12 Skipped: 1



ANSWER CHOICES ▼	RESPONSES ▼
▼ Yes	100.00% 12
▼ No	0.00% 0
TOTAL	12

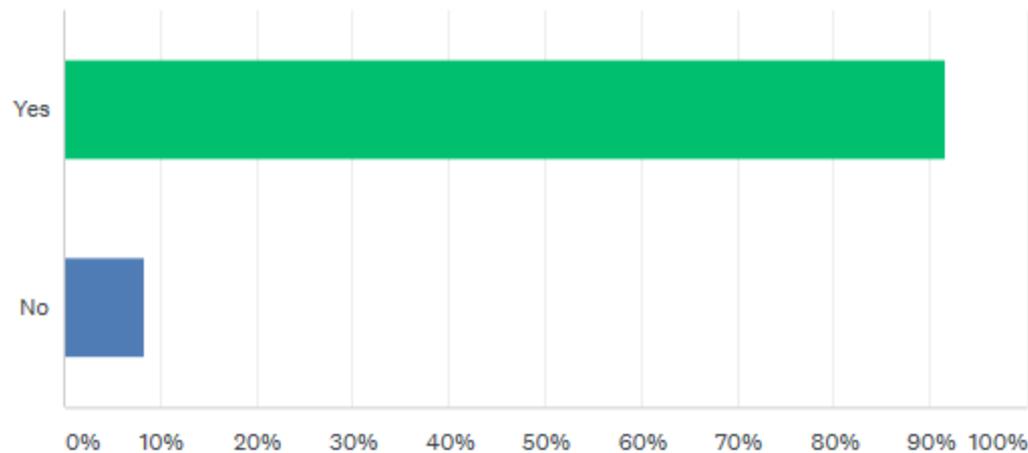
Q5

Customize

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If there was a method for soluble micronutrients accepted by both states and industry to test for soluble nutrients, would you make reference to the soluble portion of nutrient in your product on the label or in marketing information?

Answered: 12 Skipped: 1



ANSWER CHOICES	RESPONSES
▼ Yes	91.67% 11
▼ No	8.33% 1
TOTAL	12

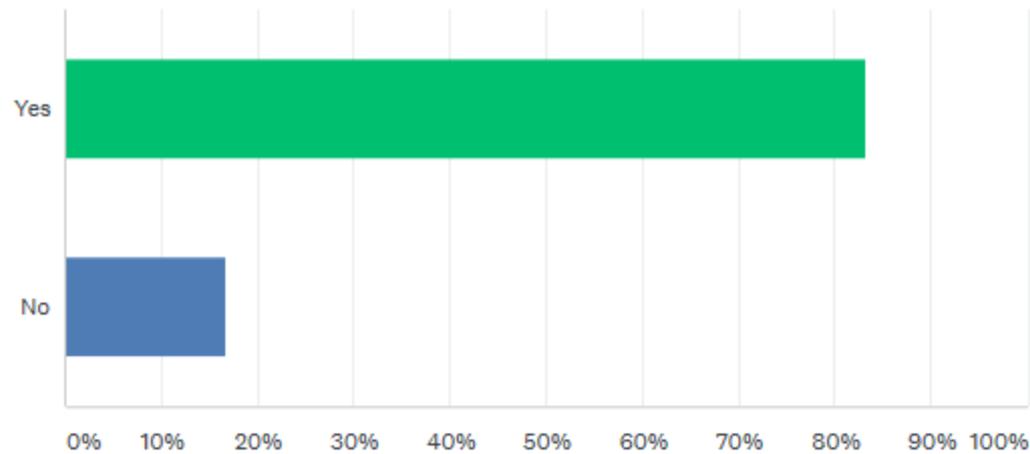
Q6

Customize

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Would your company be interested in supporting work to develop universal methodology to test for soluble nutrients?

Answered: 12 Skipped: 1



ANSWER CHOICES ▼	RESPONSES ▼
▼ Yes	83.33% 10
▼ No	16.67% 2
TOTAL	12

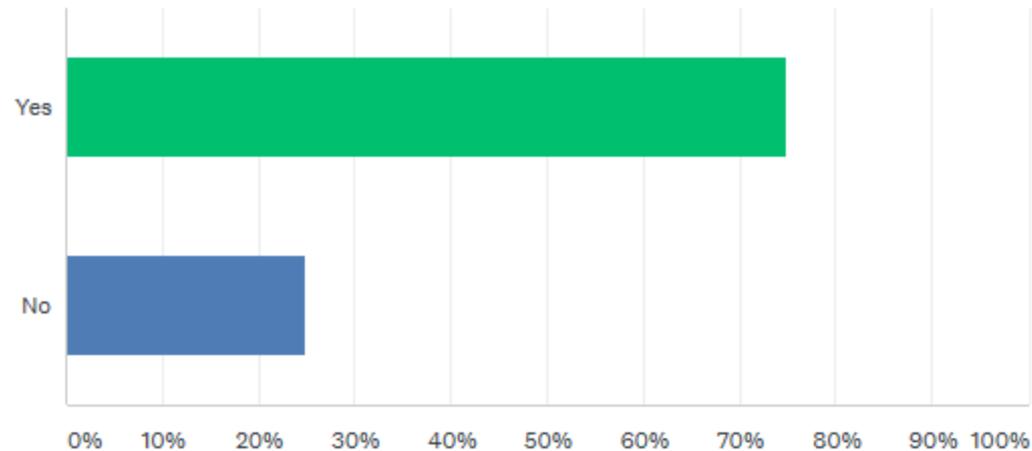
Q7

Customize

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Does your laboratory (or the laboratory you contract with) participate in a Proficiency Testing Program to evaluate the laboratory's performance?

Answered: 12 Skipped: 1



ANSWER CHOICES	RESPONSES	
▼ Yes	75.00%	9
▼ No	25.00%	3
TOTAL		12

What improvement(s) would you like to see made to current methods of analysis of micronutrients in fertilizer?

Must be a straight forward test with high reliability

Standardization across states Measuring of water-soluble micronutrient content

Improved simple methods for determining organics. IE Fulvic acid , Humates, Citrates etc.

we would need more information on the actual currently used methods to be able to answer this question.

N/A

Method Harmonization

The largest issue we see is the present of zinc oxide in zinc sulfate. Standard testing methods allow for adding sulfuric acid in the testing procedure, which only reacts with the ZnO, forming soluble Zinc Sulfate. So the lab results are not accurate with the actual material. Do not allow for acidic aids in the testing procedure.

What improvement(s) would you like to see made to current methods of analysis of micronutrients in fertilizer?

Source of ingredient, such as a blend that says Zinc. Is it Zinc Sulfate or Zinc Oxide. If it is a blend of the two sources such as an Oxy/Sulfate. What percentage is Oxide and what percentage is Sulfate.

AOAC Methods for Fertilizer have been standardized for AA for many years. Most laboratories utilize ICP and have had to modify the AA methods accordingly. This has resulted in non-standardized procedures being utilized. Some laboratories have adopted AOAC 2017.02. This method may be acceptable where low levels of micronutrients are contained in the sample but are inadequate when the sample contains higher concentrations > 10% of the micronutrient. Labs may not adhere to direction to determining the limits of quantitation and detection that are included in the procedure.

A standardized method that checks for total nutrients separately from heavy metals. Too much difference in concentration to test them together.

Take into consideration different forms of slow-release rather than just polycoated

Q9

Save As ▼

What instrumentation would be used in the method of your choice for micronutrient analysis?

Small sample dissolution and lab on a chip

ICP

ICP

current method used for ours is AA. ICP is the secondary that is used sometimes

ICP-MS

AAs, ICAP, (Titration)

ICP-OES

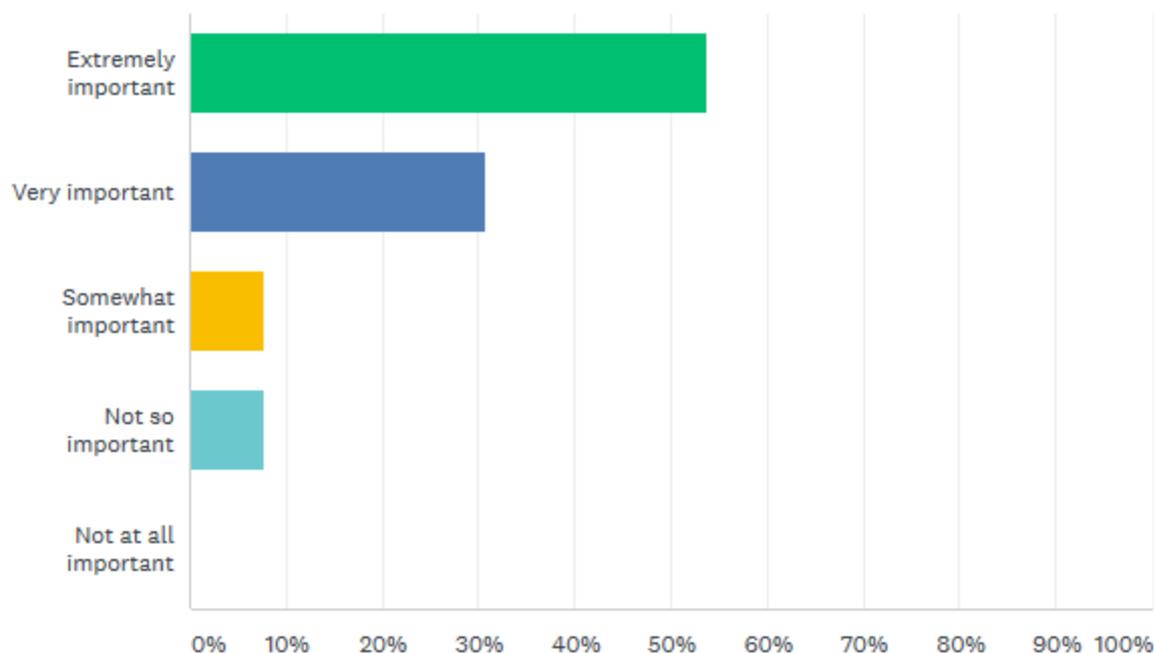
ICP

We use an AA.

HPLC

Select the level of importance in your company concerning the regulation of micronutrients in fertilizer.

Answered: 13 Skipped: 0



ANSWER CHOICES ▼	RESPONSES ▼
Extremely important	53.85% 7
Very important	30.77% 4
Somewhat important	7.69% 1
Not so important	7.69% 1
Not at all important	0.00% 0
TOTAL	13