The use of biostimulants is a main factor responsible for an overall increase in plant biomass, which leads to higher crop yields. Biostimulants, by definition, stimulate the growth of crops. However, biostimulants alone cannot achieve high yields. Plant nutrition is the building block of this increase in plant metabolism. When biostimulants are used on crops, high yields require a boost in both nutrition and hormone precursors to enhance crop metabolism and growth.

ION*fx*™ Suite Benefits

The function of the ION*fx* Suite is to aid in the transport of nutrients and metabolites throughout the plant and supporting the production and storage of carbohydrates and proteins within the tissues of the plant. Proper management of soil nutrition is critical to the success of any biological inoculation regimen. Water use efficiency and soil structural properties also play vital roles in this process, and are facilitated by good nutrition. Agrovive™ recommends a "full panel" soil test every spring to determine if the basic building blocks for a successful season are available in adequate quantities. Without proper nutrition, the yields you are investing in with any Biostimulant product will prove elusive. Agrovive recommends that the following parameters be discussed with your agronomist and/or Ag Chemical suppliers prior to implementing a Biostimulant strategy on your operation.

See our website for more information and to sign up for our newsletter for updates.

Sign up for the newsletter and get a discount code for an Agrovive Full Panel tissue or soil test discount at MMI Labs, Athens, GA.

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BIOSTIMULANTS AND PLANT NUTRITION

We recommend the use of Biopryme at the last field pass of the season, prior to crop fill. Biopryme has been developed through extensive testing to provide a good base of nutrition in plants that are treated with the ION*fx* Suite of products. These products provide a stable and herbicide compatible nutrition source for your plant's microbial community. This will not provide everything the plant may need in a season, so tissue tests should be sampled to determine deficiencies in the plant. The tests should be used to support the grain that may be denied the proper nutrition, due to its distance from the plant's root mass.

Plant nutritional tables for over 1,400 plant species can be found in Plant Analysis Handbook III, © 2014 Micro Macro Publishing. This resource is available on Amazon and eBay. Tables used with permission of authors.

"Full panel" soil test includes:

Macronutrients	Micronutrients	Other Parameters
Total Nitrogen	Boron	pH (water)
Ammonium (NH4+) Nitrogen	Cobalt	CEC (calculated)
Nitrate (NO3-) Nitrogen	Copper	% Base Saturation (calculated)
Phosphorus (as Phosphate)	Iron	Organic matter
Potassium	Manganese	pH
Calcium	Molybdenum	Buffered pH, as needed for CEC calculations
Magnesium	Nickel	
Sulfur	Zinc	

Below are ranges of base nutrient levels in soils to needed to gain the full benefit of IONfx™ application. Consult with your agronomist regarding levels of these nutrients and N-P-K in order to achieve optimum crop performance.

Baseline Soil Nutrition Ranges to achieve optimum benefits from using ION*fx* with most crops.

	Ca	Mg	S	Fe	Mn	B	Cu	Zn	Mo	Ni	Co
Range	400	100	24	5	8	0.5	1	3	0.2	0.1*	0.1*
	2000	300	50	50	50	1	12	20	0.5	0.3*	0.2*

* Nickel and cobalt requirements have not been established for most crops, values presented are estimates.

Agrovive™ also recommends one or more tissue samples be tested during the growing season to determine if the nutrients that have been invested in the soil are being taken up, and are adequate and in balance inside the plants. Tissue testing is important just before the critical stages in plant growth, for maximum crop yield and quality. These critical stages vary by crop, such as at V4-V5 for corn, when ear size is set, and again just prior to grain fill to ensure complete grain fill. This is similar for wheat, barley and other grains. Also, midseason tissue testing may be used as the crop approaches rapid growth or maturity, such as beginning pod fill in soybeans and canola, or during rapid growth of forages to increase high relative feed value. Agrovive™ suggests a "full panel" tissue test be conducted to determine which nutrients, if any, and allow time for these limiting nutrients be applied to help the crop reach its genetic potential.

"Full panel" tissue test includes:

Macronutrients	Micronutrients
Total Nitrogen	Boron
Nitrate (NO3-) Nitrogen	Cobalt
Phosphorus (as phosphate)	Copper
Potassium	Iron
Calcium	Manganese
Magnesium	Molybdenum
Sulfur	Nickel
	Zinc

The nutritional needs of individual crops vary. Below are tables that provided a suggested range for each nutrient by crop. Please consult with your local agronomy professionals to determine how to proceed to support the success of your individual operation.

	Ca	Mg	S	Fe	Mn	B	Cu	Zn	Mo	Ni	Co
CORN V3 TO V5											
Range	0.30	0.15	0.15	30	20	5	5	20	0.1	.05	.05
	1	0.65	0.4	250	150	25	20	70	0.2	5	2
SOYBEAN R1											
Range	0.8	0.25	0.25	25	17	20	4	21	0.1	.05	.05
	1.4	0.7	0.60	300	100	60	30	80	0.2	5	2
CANOLA (RAPESEED) FULL CABBAGE JUST PRIOR TO BOLT STAGE											
Range	1.0	0.2	0.17	30	25	15	4	22	0.25	.05	.05
	3.0	0.75	1.04	200	250	54	25	49	0.60	5	2
SPRING WHEAT AT FLAG LEAF											
Range	0.2	0.15	0.15	25	25	6	5	15	0.09	.05	.05
	0.5	0.5	0.4	100	100	10	25	70	0.18	5	2
WINTER WHEAT AT FLAG LEAF											
Range	0.2	0.15	0.15	10	16	1.5	5	20	0.1	.05	.05
	1.0	1.0	0.65	300	200	4.0	50	70	0.5	5	2
FIELD PEAS FIRST BLOOM											
Range	1.2	0.3	0.08	50	25	5	7	25	0.6	.05	.05
	2.0	0.7	0.16	300	400	60	10	400	1.13	5	2
RYE PINACLE INITIATION											
Range	0.2	0.2	0.15	30	14	1.5	5	18	0.2	.05	.05
	1.0	0.6	0.65	200	45	4.0	10	70	2.0	5	2
ALFALFA JUST PRIOR TO FLOWERING											
Range	1.8	0.3	0.26	30	31	30	7	21	1.0	.05	.05
	3.0	1.0	0.50	250	100	80	30	70	5.0	5	2
BARLEY FLAG LEAF											
Range	0.3	0.15	0.15	30	25	1.0	5	15	0.11	.05	.05
	1.2	0.50	0.40	200	100	5.0	25	70	0.18	5	2
OATS											
Range	0.2	0.15	0.15	40	25	1.5	5	15	0.2	.05	.05
	0.5	0.5	0.4	150	100	4.0	25	70	0.3	5	2
PINTO BEAN BLOOM STAGE											
Range	0.45	0.25	0.2	20	20	6	6	15	2.0	.05	.05
	1.9	1.4	0.39	250	90	24	19	69	20	5	2
SUNFLOWERS (SUMMER)											
Range	1.5	0.25	0.30	50	50	35	4	25	0.25	.05	.05
	3.0	1.00	0.55	750	1000	150	25	100	0.75	5	2
TIMOTHY AND SWITCH GRASS											
Range	0.15	0.14	0.14	41	50	5	10	40	0.12	.05	.05
	0.24	0.33	0.32	85	209	11	15	65	0.65	5	2
COTTON FULL BLOOM											
Range	2.20	0.3	0.3	40	30	20	5	20	0.4	.05	.05
	3.50	0.8	0.9	300	300	60	25	100	1.0	5	2