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RAFAEL 'NENE' ABELLO Hacienda Progreso Isabela, Negros Occidental "I have seen the significant difference of GameChanger's **NITROBOOST** and **COMPLETO+** versus my usual foliar inputs on leaf nutrient levels, crop health vigor and final yield results in the large plot trials conducted in the 2020 season.

We are continuously evaluating and finetuning the suitable NITROBOOST & COMPLETO+ rates depending on variety, soil types and general field conditions as we explore ways to push yields with precision farming tools like leaf nutrient analysis, satellite-based crop monitoring system, drones and new application technology by the GameChanger group."



GAMECHANGER Foliar Feeding Program

PROGRESSIVE VS Traditional

Precision Farming

- How much % of Nitrogen is in my plants per KG of leaf tissue samples?
- From my leaf samplings, xx% increase in %N/KG leaf samples from planting to growing and reproductive stages correlates to an increase in tonnage between xx% to xx%
- Which fields or stages will require more steady, sustained supplementation?

Conventional Farming

- I put xxxKG Nitrogen per hectare in 3-5 split application timings
- For the last 3 seasons, xxxKG of NPK equates to more or less XXX tons per hectare
- Fertilization application rate will be uniform across fields for a more stable yield
- We have been following this protocol for decades - why change?

PLANT NUTRITION BASICS Sugarcane NPK Needs & Uptake Curves

- Steady upward demand for N from 60 DAP up to 250 DAP
- N application best at 1KG per ton of expected ton-cane/HA*
- N best applied in 3 applications, 3-4 months after planting
- Higher demand for K between 4-2.5 months before harvest
- Grand growth stage (180-240 DAP) applications of N+B+Zn and/or N-P-K + TE may further push yield volume and quality

Source: p.71, Fertigation-A Novel Method Applying **Crop Nutrients P. Soman, Chief Agronomist, JAIN** Irrigation (Global), NIPA 2021



IJ	NUTRIENT	FUNCTIONAL VALUE	NUTRIENT	FUNCTIONAL VALUE
	NITROGEN (1-6%)*	 Primary building block for amino acids, protein, protoplasm and chlorophyll Critical for rapid shoot growth, bud vigor, flower differentiation and fruit set Drives tillering, stem and leaf area development 	COPPER (2-50ppm)*	 Essential for flowering, heading and overall crop development Promotes grain filling in cereals and biomass translocation from the stem Critical for photosynthesis
סואכ	PHOSPHORUS (0.05-1%)*	 Restores the vital energy production of the plant to increase root and shoot growth Promotes roots, flower and seed development Hastens maturity and fruit development 	MANGANESE (5-500ppm)*	 Aids in Nitrogen utilization and assimilation essential for growth Stimulates enzymes required in photosynthesis Aids in the absorption of Phosphorus and sythesis of Chlorophyll
VAIAN	POTASSIUM (0.3-6%)*	 Promotes biosynthesis of sugars and starches leading to higher yield and brix Restores vital crop water balance Regulates stomatal opening to improve photosynthesis Enzymatic activator for biomass production 	BORON (2-75ppm)*	 Aids in Calcium translocation (roots, cell wall) Shoot lignification, Root growth Transport of water, potassium and sulfur Sugar translocation to fruit
	IRON (10-1000ppm)*	 Helps in chlorophyll formation giving the plant oxygenated and healthy green color Assists in plant energy production Helps reduce nitrates and sulfates 	ZINC (5-100ppm)*	 Synthesis of proteins and auxins Calcium translocation Regulates nutrient uptake Early root growth, Rapid crop response Uniform maturity

p.120, Agronomy Handbook, Don Ankerman, B.S. & Richard Large, Ph.D.

Hacienda Progreso Large Plot Trial

Planted 27 April 2020, Isabela, Negros Occidental

	Products	Dosage/HA	Timing of Application
T1*	Brand P Brand E + Brand P Brand E + Brand P	1L 2L + 1L 2L + 1L	21DAP 60DAP 90DAP
Т2	NITROBOOST	2L 2L	60DAP 80DAP
Т3	NITROBOOST	5L 5L	60DAP 80DAP
Т4	NITROBOOST	10L 10L	60DAP 80DAP
Т5	NITROBOOST	10L 10L 10L	60DAP 80DAP 100DAP
Т6	COMPLETO+ NITROBOOST	10L 10L	60DAP 75DAP
Τ7	COMPLETO+ NITROBOOST	15L 15L	60DAP 75DAP
Т8	COMPLETO+	2L 2L	60DAP 75DAP
Т9	COMPLETO+	10L 10L	60DAP 75DAP
T10	COMPLETO+ NITROBOOST NITROBOOST	5L 5L 5L	60DAP 75DAP 95DAP

OBSERVATIONS

- At 150 DAP, NITROBOOST and COMPLETO+ treatments are significantly higher in height, girth and number of tillers
- Lowest NITROBOOST rates at 4 liters already beating planter's practice in height, girth and # of tillers & N level percentage per KG leaf sample
- Average girth at Harvest +8.3% to +25% bigger rate versus planter's practice for NITROBOOST and COMPLETO+
- 7% to 32% Increase in leaf Nitrogen levels versus planter's practice between 60 DAP benchmark & 150 DAP correlating to increase in girth, height, # of tillers in 10-meter row and up to millable stalks at harvest Yield in TC/HA based on # of tillers per 10 meter row +/- 10%**







*Planter's Practice

Leaf Tissue Analysis % Nitrogen Per KG Sample













Final Yield Results



GameChanger Protocol VS Planter's Practice

120 115

110

100

NITROBOO "The Growth & Yield Booster

21 to 30 Days Smart-Release Fertilizer

4x to 30x plant absorption efficiency

Superior growth & yield performance

Stimulates growth and tillering while

increasing leaf surface permeability

Methanal component serves as sticker

during foliar spray

Boron for growth and translocation of sugar,

calcium, water, potassium & sulfur

Zinc for rapid crop response and synthesis of

auxins, root growth

Technical grade, no chlorides, no burn

Low salt index, no phytotoxicity

BOIDST

NPK

30.75 - 0 - 0

with

Zinc (3,070 mg/L) Boron ((3,070 mg/L)

SMART RELEASE

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(R) OMPLETC

"Enhancing Crop Quality **Volume Plus BRIX**



19 -

Chelated Trace Elements

Iron (1,300mg/L) Boron (200mg/L) Copper (630mg/L) Manganese (700mg/L)



- 14 Days Smart-Release Fertilizer
- 4x to 30x plant absorption efficiency
- **Enhances crop quality & performance**

Restores the vital energy production of the plant to increase root and shoot growth

Phosphorous promotes root and shoot growth as well as tillering

Potassium serves as activator for biomass production, biosynthesis of sugars and starches for higher yield and brix factor

Boron for growth and translocation of sugar, calcium, water potassium & sulfur

Copper critical for photosynthesis and overall crop development

Iron helps in chlorophyll formation & overall plant energy (growth) production

Manganese aids in uptake and utilization of Nitrogen, Phosphorus & Magnesium

Zinc for rapid crop response against stress, synthesis of auxins and root growth

Leaf Nitrogen Distribution

NIT<u>ROBOOST®</u> COMPLETO+[®]

Highly Absorbable Micro-Droplets



Other Brands

Non - Absorbable **Dried Crystals**



Homogenous **Neon Liquid**

NITROBOOST[®]



Other Brands

Coagulated **Precipitates**

NITROBOOST "The Growth & Yield Booster"

Crop	Foliar Rate (Liters/Ha)	Recommendations
Vegetables	3-6	Apply every 21-30 days from mid-crop
Brassicas	3-10	Apply at early head development Repeat every 21-30 days
Onions	2-10	 Apply from when sufficient leaf exists to intercept spray Apply at bulb development at intervals of 21-30 days
Sugarcane	2-10	 Apply at 60 DAP, 80 DAP and 100 DAP (Days After Planting) Option to apply at intervals of 21-30 days as needed from 120 DAP to 200 DAP via drone to further push yield volume Alternating application with COMPLETO+ as needed especially with ratoon crop
Corn	3-10	 As Urea Booster (in addition to granular side dress) spray 3-5 liters per hectare at 25-30 DAT (Days After Transplant) to maximize yield As Side Dress Urea Replacement, spray 10 liters per hectare at 25-30 DAT Follow-up spray at 50 DAT with COMPLETO+ at the rate of 3-5 liters per hectare to maximize yield increase
Rice	3-10	 As Urea Booster (in addition to granular side dress) apply 3-5 liters per hectare at 25-35 DAT (Days After Transplant) to maximize yield As Side Dress Urea Replacement, spray 10 liters per hectare at 35 DAT Follow-up spray at 50 DAT with COMPLETO+ at the rate of 3-5 liters per hectare to maximize yield increase
Fruit Trees	3-10	 Apply from early bloom through fruit set Repeat application after 30 days Double spray rate at post-harvest Spray volume at 2,500 liters per hectare or 2-6 tank loads per tree
Banana	2-10	 Repeat every 21-30 days until 4 weeks before harvest Triple the rate per hectare when applied via fertigation
Pineapple	2-10	Apply every 21-30 days from fruit set up to 4 weeks before harvest Triple the rate per hectare when applied via fertigation
Turf (GRASS)	10-50	 Apply at 1:20 water dilution at 4-6 weeks interval for optimum turf (grass) growth Can be applied as foliar spray at 1:10 dilution rate or drench at 1:20 dilution rate SRN can release over 20 -30 days on leaf surface and up to 8-10 weeks in the soil
Cutflowers	2-10	 Do not apply as foliar spray when plants are already in bloom To apply as foliar, use lower rate (5 liters) at 1:100 dilution; as drench or via fertigation use higher rate (10 liters) at 1:100 dilution

COMPLETO+[®] "Enhancing Crop Quality,

Volume Plus BRIX"

Crop	Foliar Rate (Liters/Ha)	Recommendations	
Vegetables	3-6	Apply every 14 days from mid-crop or when flowering starts	
Brassicas	3-6	Apply at early head development Repeat spray every 14 days or as follow-up to NITROBOOST	
Onions	3-10	Apply from when sufficient leaf exists to intercept spray Apply at bulb development	
Sugarcane	2-10	 Apply at 100 DAP and 115 DAP (Days After Planting) Option to apply at intervals of 14 days as needed from 130 DAP to 250 DAP via drone to further push yield volume and sweetness (Brix/PSTC) Best to apply after NITROBOOST when canopy closes and up to 2.5 to 4 months before harvest for higher brix factor or sugar content 	
Corn	3-10	 Apply at 45 DAP and follow-up spray at 55 DAP to maximize yield advantage 	
Rice	3-10	 Apply at panicle initiation Apply at 35 DAT (Days After Transplant) Follow-up at 50 DAT to maximize yield and grain quality 	
Fruit Trees	5-10	 Apply from early bloom through fruit set Repeat application after 30 days Double rate of application per hectare at post-harvest Spray volume at 2,500 liters per hectare or 2-6 tank loads per tree 	
Banana	2-10	 Apply every 14 days from fruit set to harvest Triple the rate per hectare when applying via fertigation 	
Pineapple	2-5	 Apply every 15 days early in season and from fruit set to harvest Triple the rate per hectare when applying via fertigation 	
Mango	10-50	 Apply at the minimum rate at Bud Swell and Panicle Emergence Double the rate of application per hectare at Pre-flowering At flowering stage, apply minimum rate per hectare Spray volume at 2,500 liters water per hectare or 2-6 tank loads per tree 	
Cutflowers	2-10	 Do not apply as foliar spray when plants are already in bloom To apply as foliar, use lower rate (5 liters) at 1:100 dilution; as drench or via fertigation, use higher rate (10 liters) at 1:100 dilution 	

BIG TIME HARVEST, BIG TIME PLANTER



"The future of farming is hinged around precision in terms of plant nutrient availability, pest and disease mappings on top of mechanization and automation.

Mindsets and practices need to change as new approaches and technological innovation that push yield potential spearheaded by GameChanger - Agriculture come into play. Its about time we change the game in sugarcane."

Miles Abello Hacienda Progreso Isabela, Negros Occidental





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