



Where needs take us



Bringing Innovative Technologies to Serve Farmer's Nutritional Needs

Olena Castello, Ph.D.
Market Development & Technical Service Lead, N.A.
ICL Specialty Fertilizers

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ICL Specialty Fertilizers develops state-of-the-art specialty products. Our focus on innovation has driven us to develop the world's leading controlled release and water soluble fertilizers used in Agriculture, Horticulture, Turf, and!



Foliar Feed



Agroleaf®



Drip Feed



Agrolution®

**Agrolution®
pHLow**

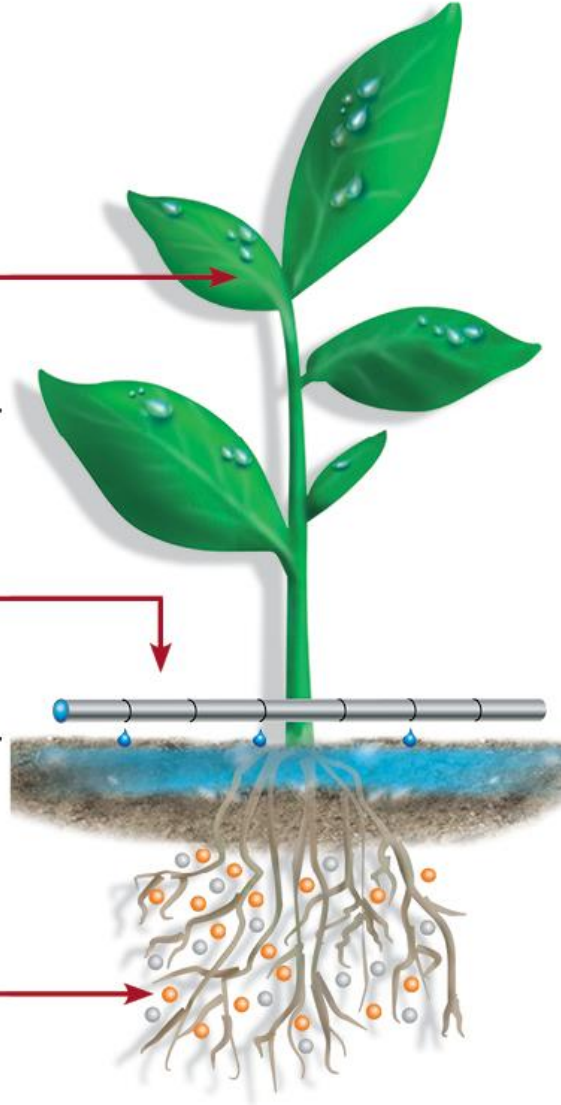


Controlled
Release



**Agroblen®
Total**

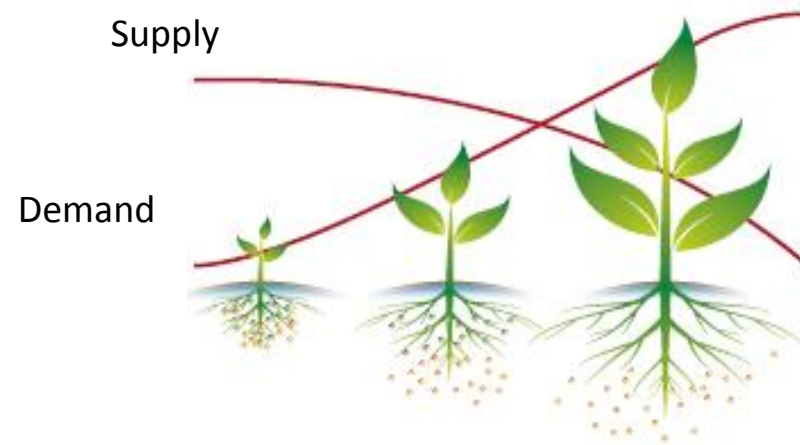
Agrocote®



CRF Application = NUE



Soluble Fertilizer Application



Benefits of including CRF in crop nutrition programs

1. **Increases nutrient use efficiency including Nitrogen!**
2. **Reduction of Nutrient losses to the environment**
3. Prevention of nutrient fixation in the soil
4. Maintaining or increasing crop yield at reduced nutrient application rates
5. Eliminating multiple fertilizer applications
6. Environmentally friendly

1. Efficiency

- ✓ Improve nutrition delivery and efficiency

2. Economy

- ✓ Reduce fertilizer, labor and resource costs
- ✓ Generate more return on investment per season

3. Ecology

- ✓ Minimize nutrient loss due to leaching, volatilization and runoff

ICL SF APPROACH TO SUSTAINABILITY



EFFICIENCY • ECONOMY • ECOLOGY

BENEFITS

Due to continuous nutrient release, stress periods of nutrient deficiencies are avoided



Due to the controlled release of nutrients, less leaching of nutrients will take place



Reductions of 40% of nutrients can be reached vs applications with conventional fertilizers

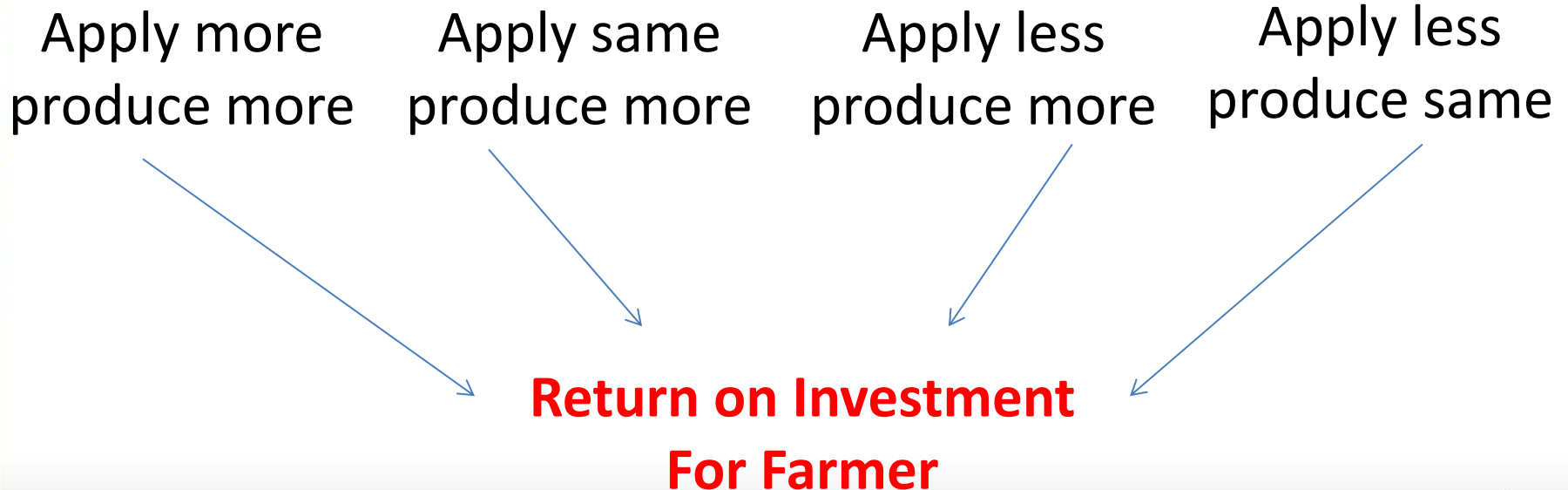


Due to the gradual release of nutrients, the EC of the soil solution is not affected

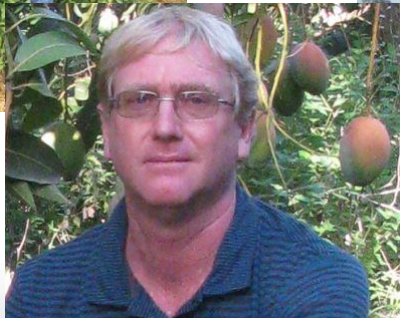


- Yield (biomass accumulation) response per unit of fertilizer applied
 - By definition, the most efficient systems will be those with no nutrient applied – but will you like the yield?

Some Strategies



Success stories – Trial Data



Strong, Healthy Root Systems Lead to Higher Productivity, **NUE** and Increased Profit Potential.



Why? **Healthy roots lead to:**

1. Protection against yield-robbing insects and diseases below the soil surface
2. **More efficient water and nutrient uptake**
3. The development of stronger stems and foliage that better withstand environmental stress
4. Protection of the crop's genetic potential
5. Roots are responsible for several important jobs, including anchoring and supporting the plant in the ground. They also hold soil in place, break up soil to create pathways for better water filtration, and absorb water and nutrients.



Conventional program →

← Agrocote program



Agrocote Max Urea

Trial Set-up

Objective: **Prove that the use of Agrocote results in greater crop nutrient uptake efficiencies compared to current grower standard practices, potentially allowing for less nutrients to be applied to obtain greater yields and ultimately improving gross profit per acre.** *The use of Agrocote Max was compared to the use of UAN to supply nitrogen, the current standard practice;* 80 pounds of actual nitrogen was supplied by both sources.

Where: Sugar Research Station, St. Gabriel, LA

Cooperator: Brenda Tubana, Ph.D.

When: Fertilizer application; Apr. 21, 2015 – Harvest; Nov. 5, 2015

Crop: Sugarcane, HoCP96-540; 1st ratoon

Soil Type: Silt Loam

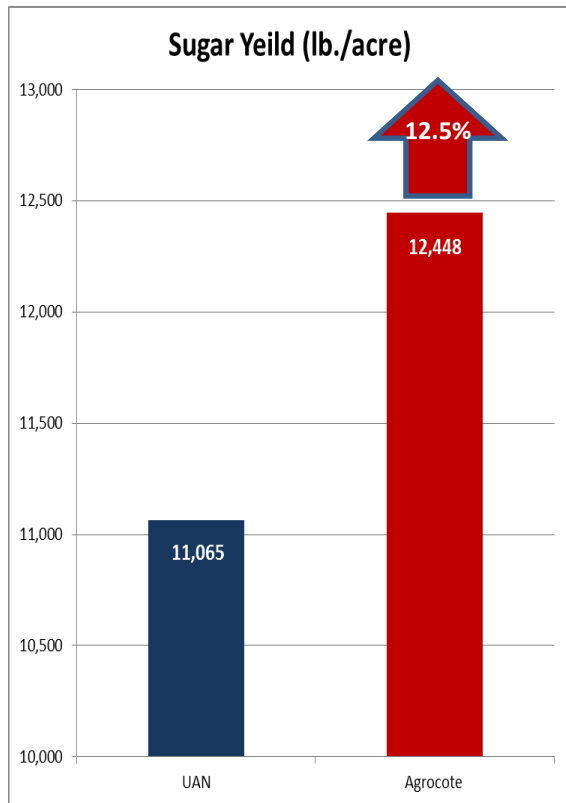
Measurements: TRS, Cane Yield, Sugar Yield

Treatment #	Description	Nitrogen (lb./acre)	Timing
1	Agrocote Max (powered)	80	April 21, 2015
2	UAN	80	

3 reps/ treatments arranged in completely random design.



Sugarcane, LSU 2015 Results



Value Equation	UAN	Agrocote
Additional cost of Program (\$/Acre)	-	\$46.77
Total Yield (Sugar lb./acre)	11,065	12,448
Price Sugar (lb.)	\$0.21	\$0.21
Income per acre	\$2,324	\$2,614
Gross Income Increase per acre	-	\$290
Agrocote ROI	-	5.2

Conclusions: The Agrocote-powered blend utilized patterned release technology to deliver nutrients at crop critical stages and provided significantly greater sugar yields.

- Increased sugar yield by 12.5%
- Increased gross profit by \$290 per acre

Agrocote Max Urea and Agrocote KCL

Trial Set-up

Objective: Prove that the use of Agrocote results in greater crop nutrient uptake efficiencies compared to current grower standard practices, potentially allowing for less nutrients to be applied to obtain greater yields and ultimately improving gross profit per acre.

Where: Sugar Research Station, St. Gabriel, LA

Cooperator: Brenda Tubana, Ph.D.

When: Fertilizer application; March 2016 – Harvest; October 2016

Crop: Sugarcane, L01-299; plant cane

Soil Type: Silt Loam

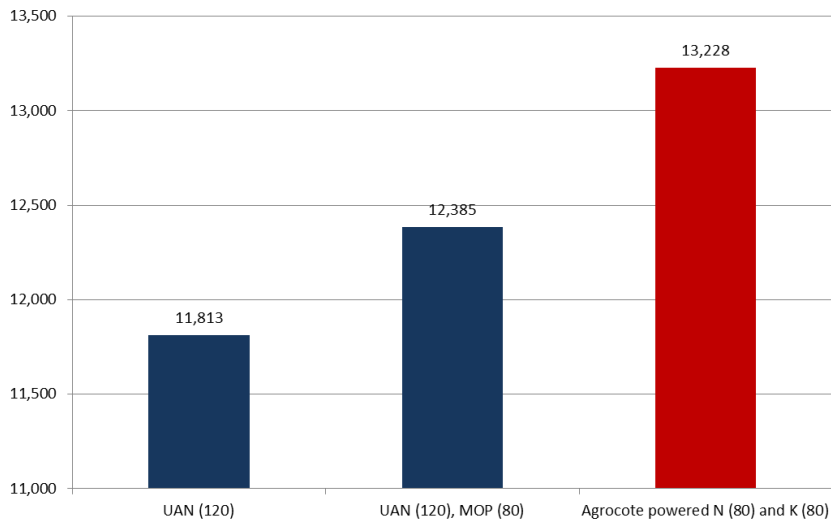
Measurements: TRS, Cane Yield, Sugar Yield

Treatment #	Description	Nitrogen (lb./acre)	K2O (lb./acre)	Timing
1	UAN	120	0	March 2016
2	UAN + MOP	120	80	
3	Agrocote powered N and K	80	80	



Sugarcane, LSU 2016 Results

Sugar Yield (lb./acre)



Value Equation	UAN +K	Agrocote N and K
Additional cost of Program (\$/Acre)	-	\$70.72
Total Yield , (Sugar lb/acre)	12,385	13,228
Price Sugar (lb)	\$0.21	\$0.21
Income per acre	\$2,601	\$2,778
Gross Income Increase per acre	-	\$177
Agrocote N +K Total ROI	-	2

Conclusions:

The Agrocote-powered N and K blends utilized pattern release technology to deliver nutrients at crop critical stages to provide improved yields (6.8% increase) and increase gross profit (per acre) by \$177.00.

Agrocote Max Urea

Trial Set-up

Objective: Prove that the use of Agrocote coated nitrogen in greater crop nutrient uptake efficiencies compared to current grower standard practices, allowing for less nutrients to be applied yields and ultimately improving gross profit per acre.

Where: Sylvester Farms, Bunkie, LA

Cooperator: Tim Sylvester and Johnny Francois

When: Fertilizer applied to dry ground with flooding on May 26, 2016

Crop: Rice, Cheniere

Soil Type: Clay

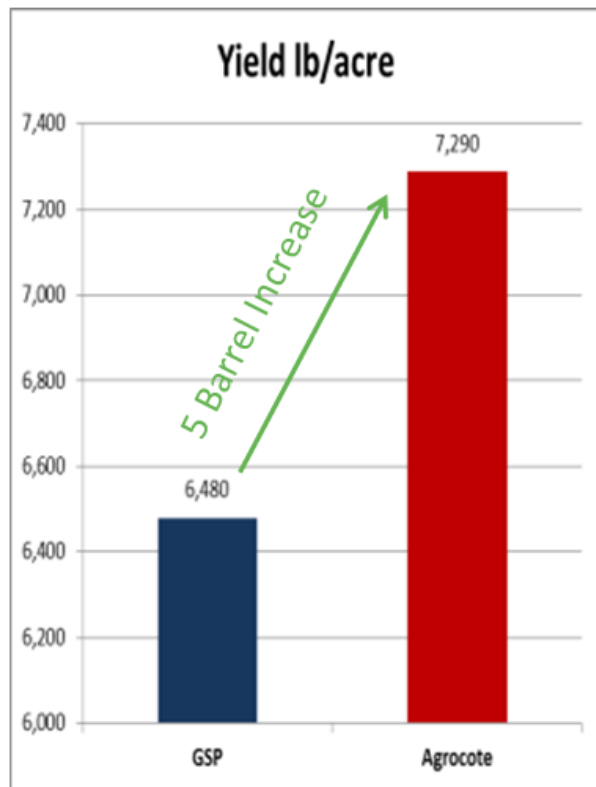
Measurements: Total Yield



Treatment #	Description	Rate (lb./acre)	Nitrogen (lb./acre)	Timing
1	Agrocote 40-0-0 +micros	363	145	Pre-flood
2	38-0-0+zinc sulfate	265	100	Pre-flood
	46-0-0	125	57.5	Green Ring

Both fertilizer treatments applied at equal cost per acre, \$125.00.

Rice Conclusions



Value Equation	GSP	Agrocote
Additional cost of Program (\$/Acre)	-	\$0
Total Yield (lb./acre)	6480	7290
Price /lb.	\$0.148	\$0.148
Income per acre	\$959	\$1,079
Gross Income Increase per acre	-	\$120
Percent yield increase		12.5%

Conclusions:

The Agrocote treatment increased yield by **12.5 %** compared to the GSP treatment despite challenging weather conditions.

The Agrocote treatment increased gross profit by **\$120 (per acre)** compared to the GSP, both treatments were applied at equal costs.

Rice A Local Story



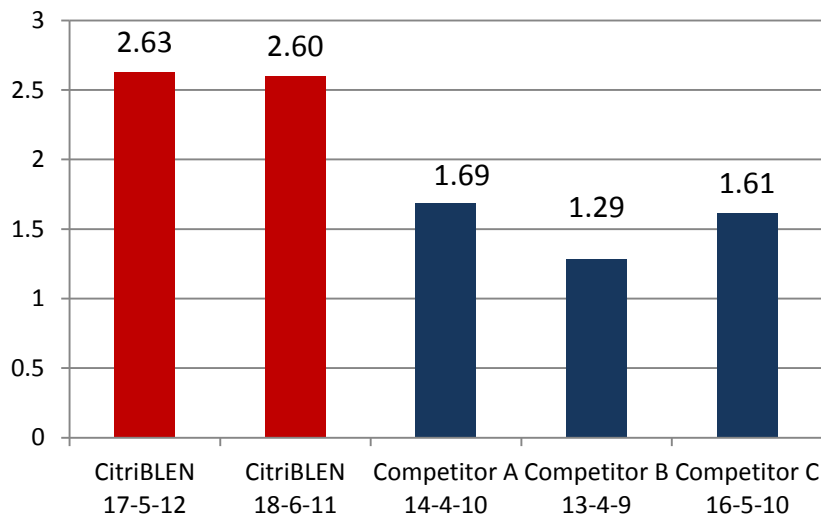
*“I used **Agrocote** in some of my fields and based on my observations I feel like rice fertilized with **Agrocote Max urea** was superior to the fields with conventional fertilizer. **The rice field with Agrocote Max provided continuous feed to the plants keeping them green all season and increasing the yield without additional cost.** In addition, there was no need for a second fertilizer application”.*

*Johnny Francois
Farm Manager, Sylvester Farms
Bunkie, Louisiana*

Citrus Results

C.W. Harrison Grove, in cooperation with the University of Florida and Tropicana

Return On Investment*



*ROI calculated as the quotient of pounds of solids produced (\$2.00 each) and the sum of the four-year fertilizer costs. ROI and economic analysis was performed by ICL Specialty Fertilizers.

Return on Investment (ROI) measures the amount of revenue generated by a specific investment. The results of this trial indicate groves fertilized with CitriBLEN return \$2.63 in revenue for every dollar spent on fertilizer compared to \$1.69 returned for every dollar for the next closest product, and increase of 54%. CitriBLEN offers the best cost-performance, maximizes grove productivity, and provides growers the best return on their fertilizer investment.

Agrocote Max Urea and Agrocote KCL

Trial Set-up

Objective: **Prove that the use of Agrocote coated nitrogen and potash results in greater crop nutrient uptake efficiencies compared to current grower standard practices, potentially allowing for less nutrients to be applied to obtain greater yields and ultimately improving gross profit per acre.**

Where: Montcalm Research Farm, Entrican, Michigan

Cooperator: Dr. Kurt Steinke

When: Spring and Summer, 2016

Crop: Chipping Potato (FL2137)

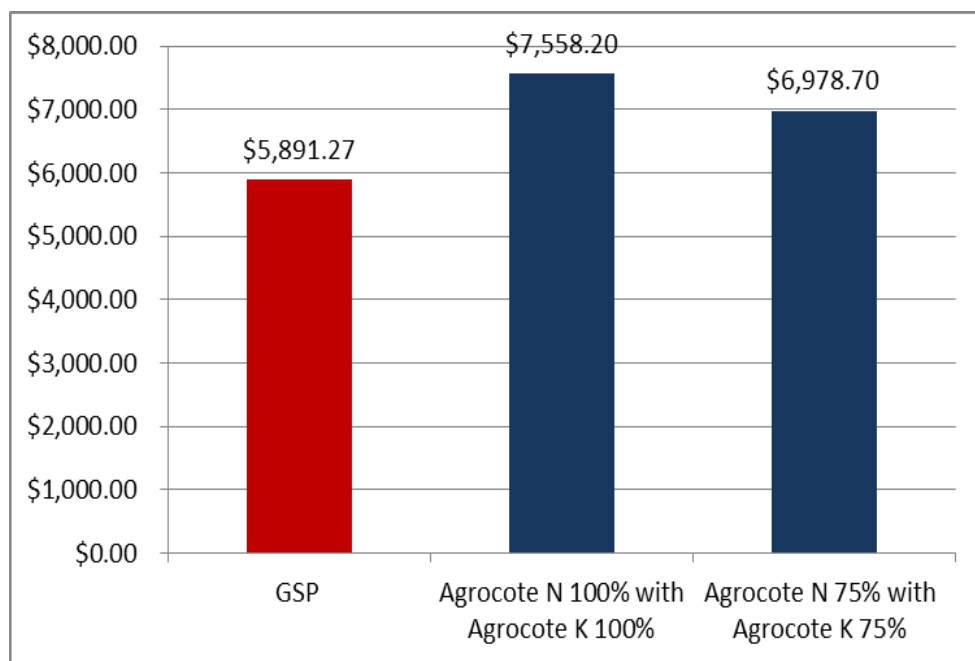
Soil Type: McBride Loamy Sand

Measurements: Yield; A's, B's, and OS (Over Size)



Potato Results

Chipping Potato Gross Profit of A's (/acre)



- With Agrocote powered N and K Gross Profit of A's (desirable size) yeilds increased by **27%** and increased profit by \$1,667 per acre compared to the GSP treatments
- With a **25%** reduction in Nitrogen and Potash applied to the crop Gross Profit of A's increased by \$1,087 per acre with Agrocote powered N and K, compared to the GSP treatments

Economic returns based on current (12/16) price of \$1.90 per 10 pound bag of round whites. For GSP, Nitrogen was supplied at 225 lb. of N/acre (+25 pounds of N from MAP, all treatments) and Potash (K) was supplied at 300 lb. of K₂O/acre. Percentages in subsequent treatments denote percent of total N and K applied. Agrocote N was supplied as a blend with 75% of N coated and Agrocote K as a blend with 50% of K coated.

Potato Results

Value Equation and Return on Investment

Value Equation	GSP	Agrocote Powered with 100%N and K	Agrocote Powered with 75% N and K
Additional cost of Program (\$/Acre)	-	\$349.55	\$223.83
Total Yield , Grade A (cwt/acre)	310	398	367
Price / cwt	\$19.00	\$19.00	\$19.00
Income per acre	\$5,890	\$7,558	\$6,979
Gross Income Increase per acre	-	\$1,668	\$1,089
Agrocote ROI	-	3.8	3.9

Blueberry, Bartow Florida Testimonial

Agroleaf

Production of blueberries are cultivated on total of 400 acres of pure sand, using heat tolerant varieties and a mix of production in containers and raised beds.

Starting at bloom and continuing through harvest Clear Springs applies ICL SF's Agroleaf foliar nutritional program.

According to Jack Green, "the Agroleaf product gives the bushes everything they need to optimize yield. With the Agroleaf program culls have gone from 15% to less than 5% due to a drastic reduction in soft fruit, at my farm, this reduction in culls could be worth as much as \$160,000 or more. 10% is huge."



Jack Green, of Clear Springs, inspects a block of blueberries just coming into bloom.

Strawberry, UC Davis, Salinas CA

Agriform

Trial Set-Up

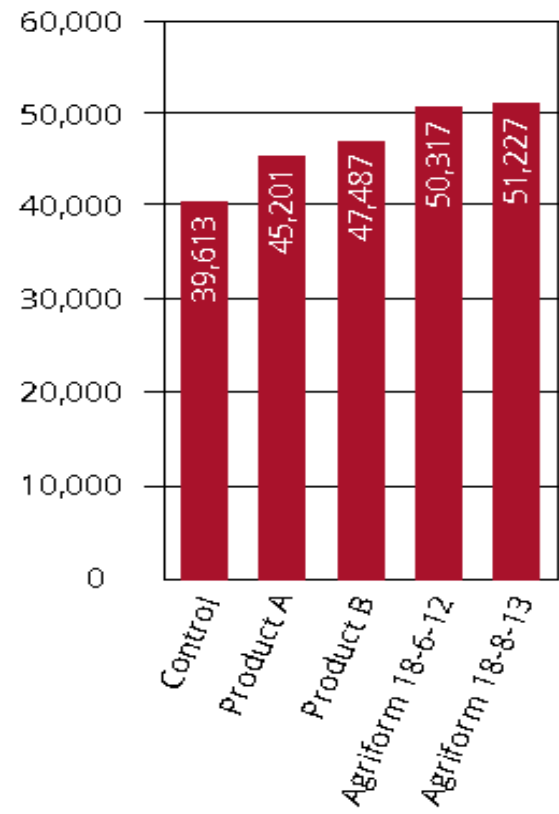
Objective: Prove that the use of Agriform results in greater crop nutrient uptake efficiencies compared to competitive controlled release fertilizers, potentially allowing for less nutrients to be applied to obtain greater yields and ultimately improving gross profit per acre.

- When: Fertilizer applied, October 27, 2008
- Planting time, November 24, 2008
- Harvest, March- June 2009
- What: All fertilizer applications supplied 126 lbs. of Nitrogen/Acre
- Where: US Davis, Salina, CA
- Crop: Strawberry, variety "Albion"
- Soil Type: Sandy Loam
- Measurements: Strawberry Yield (lbs/acre)



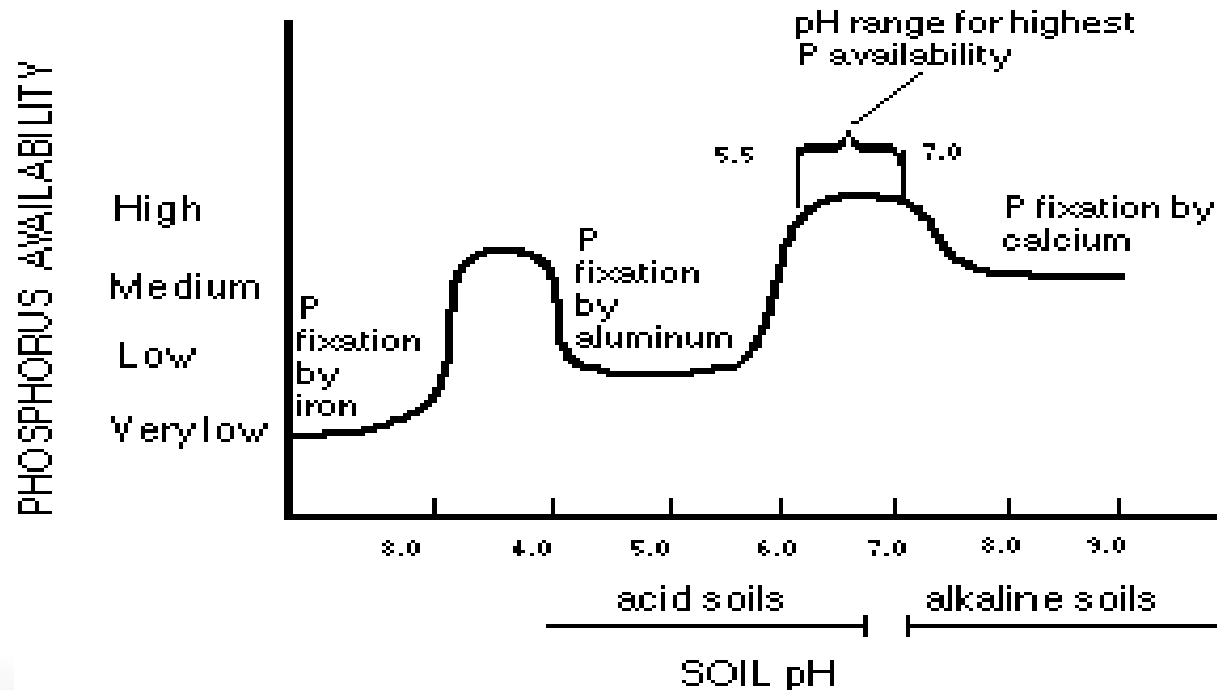
Agriform

Cumulative Marketable Yield (lb/acre)

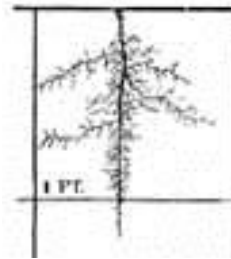


Conclusions:
The Agriform Strawberry blend utilized patterned release technology to deliver nutrients at crop-critical stages and increased yield by **29.3%** compared to Control and **13.3 %** yield increase compared to competitor product A

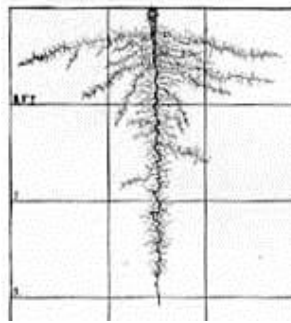
- Low phosphate recovery rates , 10-30%
 - Fixation (can eliminate 80-90% of applied phosphate)
 - Acidic soils, Fe and Al 1 billion hectares (Sanchez and Logan, 1992)
 - Alkaline soils, Ca-phosphates, 600 million hectares(Leytem and Mikkelsen, 2005)



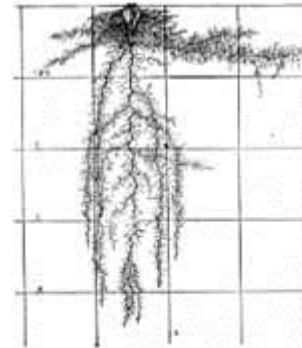
- Root Architecture and Timing
 - Will they get there? When?



2 Months



3 Months

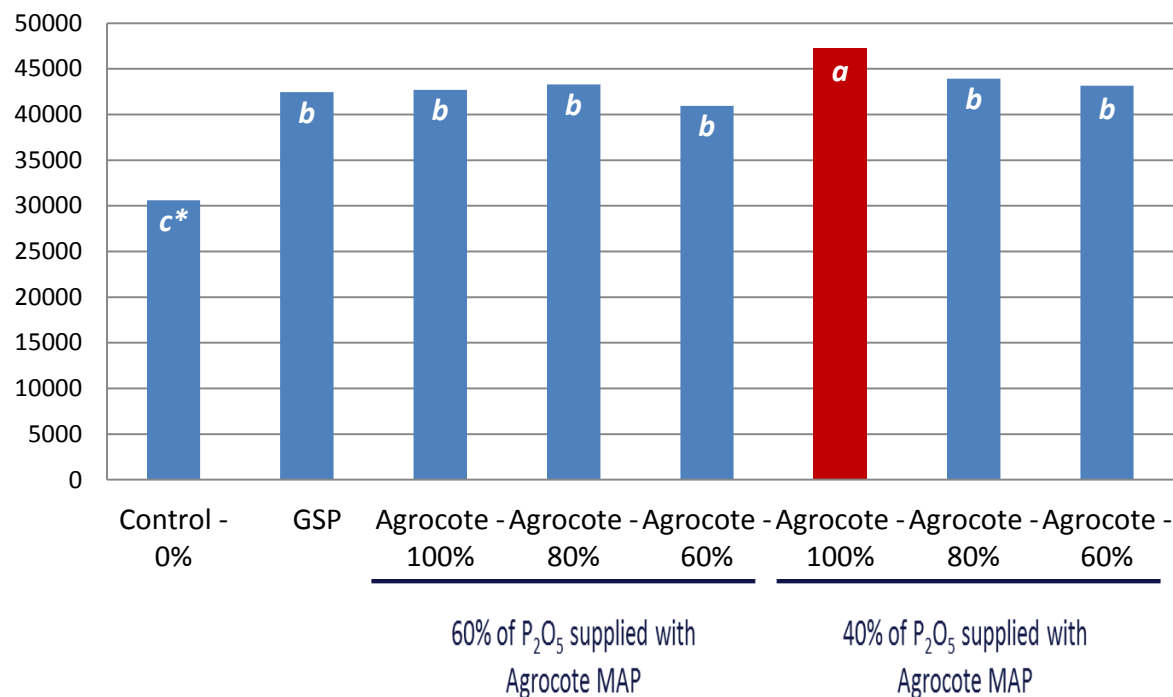


5 Months

*WEAVER, J.E. 1926
 ROOT DEVELOPMENT OF FIELD CROPS. 291 p.
 McGRAW-HILL BOOK COMPANY, INC. - New York, NY*



Potato Yield (kg/ha)



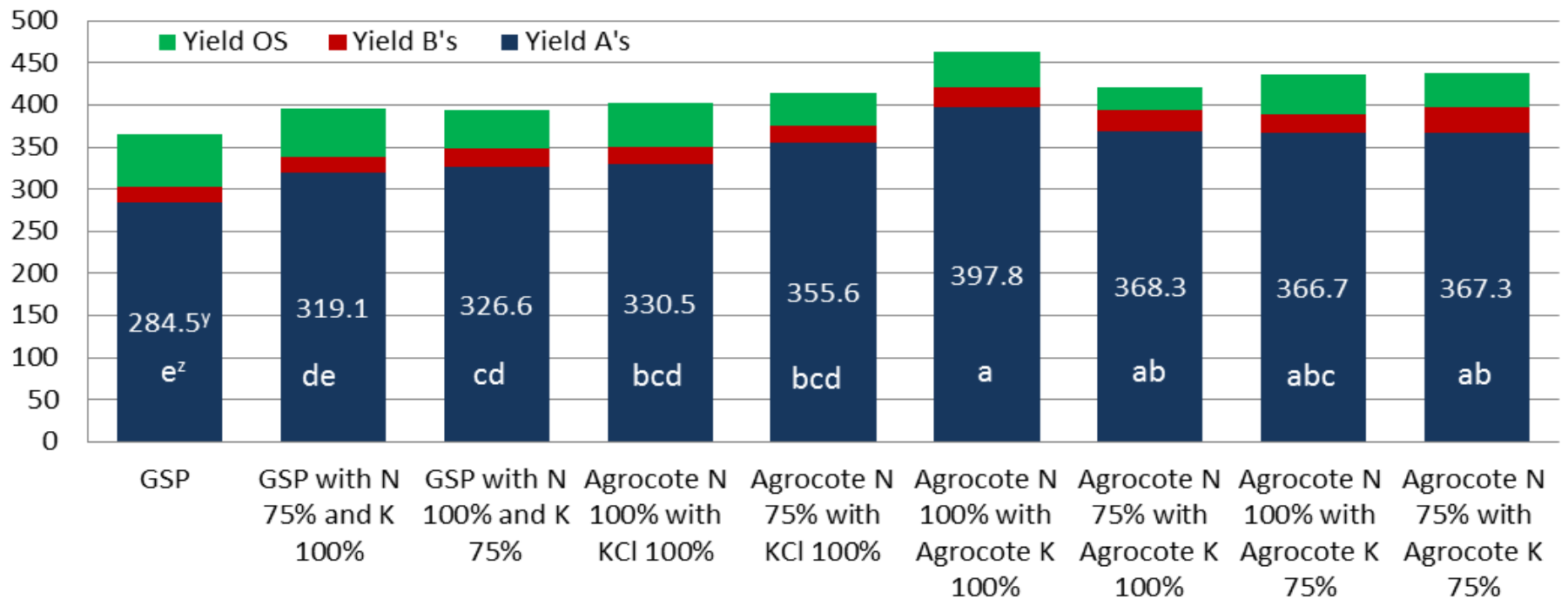
- The Agrocode (9-47-0) powered blend of 40% coated MAP and 60% uncoated MAP resulted in a 11% yield increase compared to Grower Standard Practice (GSP).
 - Priming
- The Agrocode powered blends supplying 80 and 60% of P₂O₅ in GSP were more efficient than the GSP treatment.

The background features several thick, curved lines in various colors including red, green, purple, brown, and teal. A dark blue horizontal band runs across the middle of the image, containing the text "Thank you". The background also has a subtle pattern of fine, light-colored lines.

Thank you

Potato

Chipping Potato Yield (cwt/acre)



For GSP, Nitrogen was supplied at 200 lb. of N/acre (+25 pounds of N from MAP, all treatments) and Potash (K) was supplied at 300 lb. of K₂O/acre. Percentages in subsequent treatments denote percent of total N and K applied. Agrocote N was supplied as a blend with 75% of N coated and Agrocote K as a blend with 50% of K coated.

^yTreatment means for Yield A, n=4. ^zYield A means followed with same letter are not significantly different, $\alpha = 0.10$. There were no significant differences for Yield OS, Yield B or Total Yield.



H2Flo is a wetting and water conservation agent for use with soil and enables the quick and total wetting of the soil, enhancing both the lateral and vertical movement of the wetting front. Use of this product allows for the reduction of irrigation volumes and reduced runoff, especially during initial soil wetting.

H2Flo should be applied at initial soil wet-up and in-crop with fertigation; applications should be spaced 30 days apart. H2Flo is effective in all soil types.

Timing	H2Flo Rate (fl oz/acre)	Irrigation Rates (gallons/acre)
Pre-plant, soil wet-up	16-32	100-200
Initial in-crop	16-32	100-200
Monthly in-crop	8-16	100

H2FLO – Soil applied surfactant for water conservation

Omega Farms, CA

With H2FLO (3hours)



Without (3weeks)

