Completion Report: Agrotiger Sugarcane Demo Trial. Hda. Luisita. CY2021

by

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Executive Summary

- Growth vigor parameters gathered from 30 to 180 DAP (number and size of leaves, number and size of shoots and number of shooots per linear meter hill cluster clearly show the advantage of treatments applied with Agrotiger fertilizer containing **Mycorrhyzae and Humic Acid** compared to Hacienda practice applied with ordinary ferilizer.
- The growth differrence advantage of Agrotiger fertilizer treatment and those applied with follow up spray of Hyfer foliar (**Hyfer 22-11-9 spray at 20,60,90 DAP and Hyfer plus 2-2-14 at 120 and 150 DAP**) is maintained from vegetative stage to harvest of millable canes.
- Due to higher number of millable canes per hill cluster coupled with favorable brix reading and percent sugar content, higher cane and sugar yield was achieved from Agrotiger practice.
- Based on benefit: cost ratio from Mapalacsiao demo, the Agrotiger treatments registered **2.4 vs. 1.3** from Hacienda practice suggesting that the net income per hectare can be doubled using the same NPK rate per hectare but making use of Agrotiger fertilizer instead of ordinary fertilizer. Moreover, additional yield advantage of about P67,000,00/ha. or35% more sugar yield is possible if Hyfer foliar fertilizer is applied in tradional fertilizer applied canes and 22% more sugar than in those applied with Agrotiger fertilizer only.

Fertilizer rate per hectare of treatments

T1- Agrotiger Practice

180-60-180/ha.

Basal: 3 bags Hyfer UreaMax +6.78 bags Hyfer 16-20-0

Sidedress at 60 DAP : 6 bags Hyfer 0-0-60+ 3 bags Hyfer UreaMax

NOTE: ONE BAG HYFER FERTILIZER IS 25KGS.

Contains Mycorrhizae fungus and humic acid..

T2 Agrotiger fertilizer plus Hyfer foliar fertilizer

Hyfer plus 22-11-9 spray at 20,60,90 DAP and Hyfer plus

2-2-14 at 120 and 150 DAP

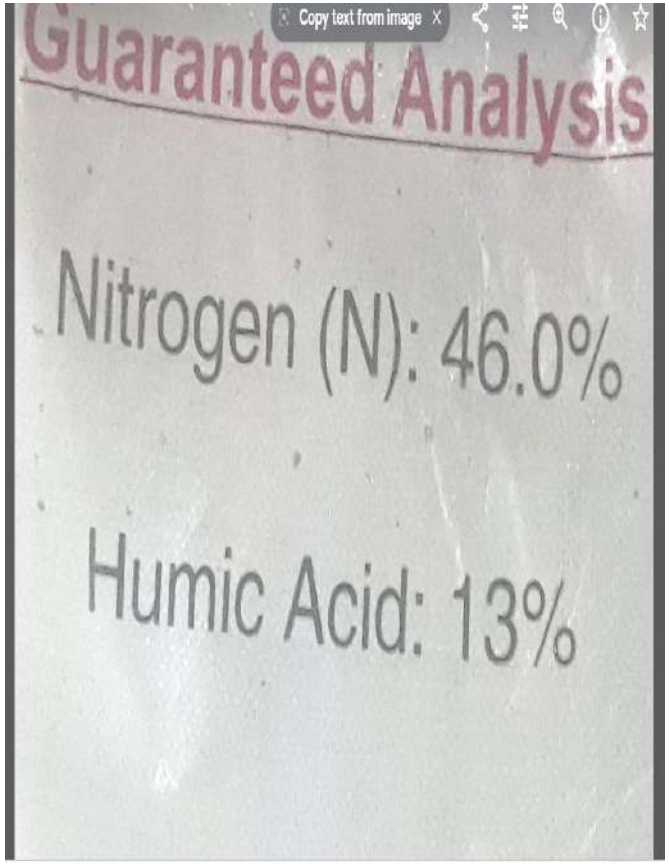
T3- Hacienda Practice

180. - 60 - 180/ha

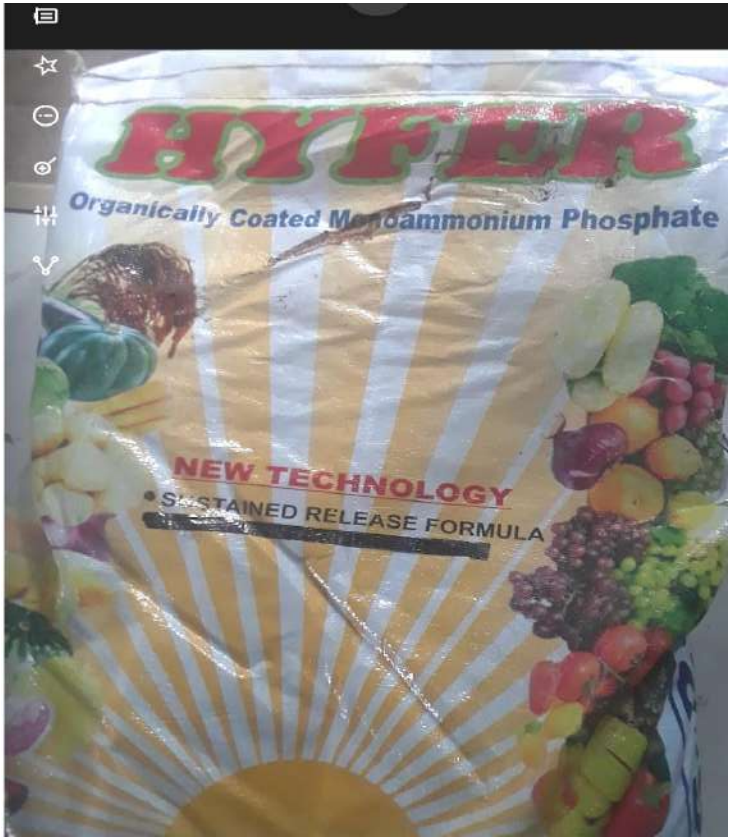
Basal: 3 bags Urea plus 6.78 bags 16-20-0

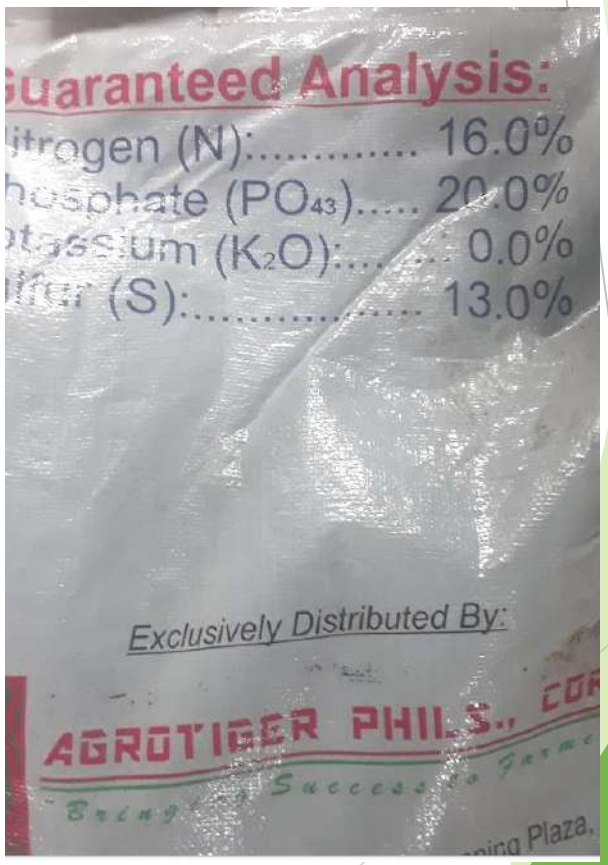
Sidedress at 60DAP: 6 bags 0-0-60 plus3 bags Urea

HyferUreaMax sack label



Hyfer Mono Ammonium Phosphate





Humic Acid

- Humic acid is a group of molecules that bind to, and help plant roots receive, water and nutrients. High humic acid levels can dramatically increase yields. Humic acid deficiency can prevent farmers and gardeners from growing crops with optimum nutrition.
- Humic acid is a chemical produced by decaying plants.
- Humic acids generally aren't considered a fertilizer. Whereas fertilizers provide specific nutrients to plants, humic (and fulvic) acids increase the availability and uptake of those nutrients, and improve the overall growing environment.

1. It is often referred to as a soil conditioner. Humic acid is nutrient rich and It improves nutrient uptake by your plant's roots, drought tolerance and even increases chlorophyll production. Humic acid helps the soil by boosting levels of microbial activity.

Mycorrhizae

"Mycor" is the Latin word for 'fungus', and "rhizae" means "roots". So, the term Mycorrhizae perfectly describes the mutually beneficial relationship between a plant and the specialized fungi that support its roots in healthy, undisturbed soil ecology.

https://www.rootrescue.com/site/mycorrhizal-science

the "rhyzae" reach and absorb soil bounded nutrients and moisture and transport them to roots for the plant to use.

Planting of canes

Fertilizer hopper and containment

Fertilizer tube down

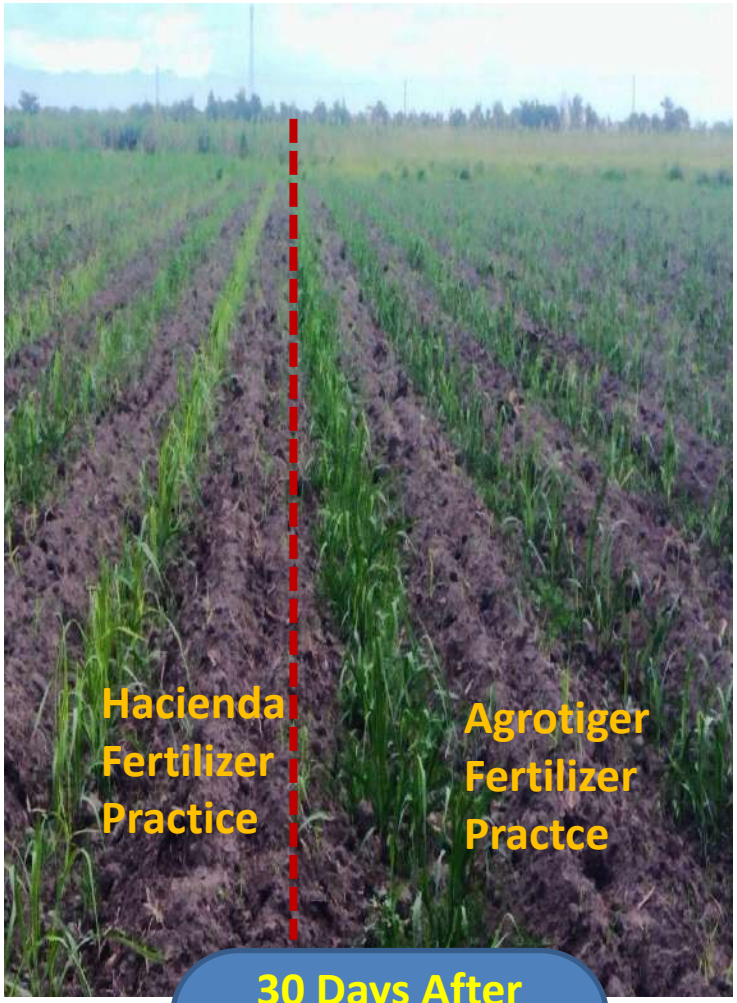
Fertilizer containment

Planting Time

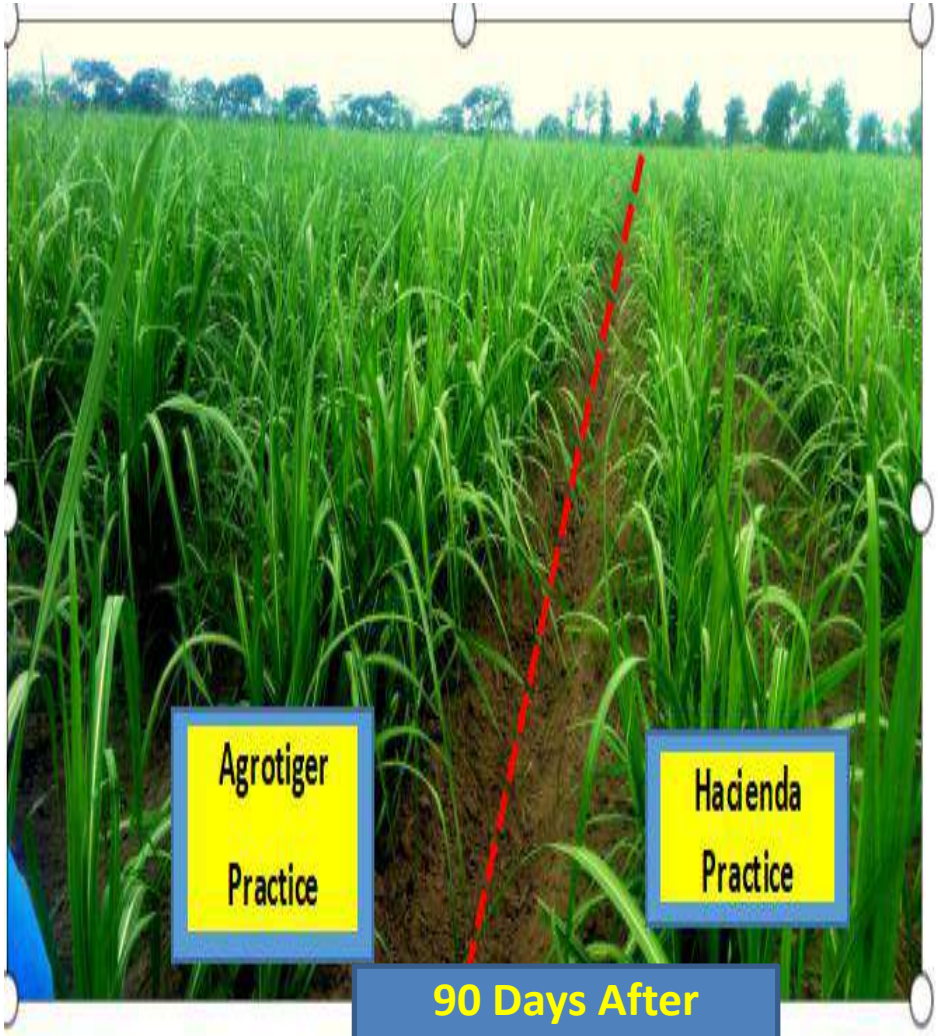
Texas Lot 42- 117 meters/row x 48 rows

1.5 meters bet. rows
3 seedpieces/linear meter

Agrotiger fertilizer demo trial in sugarcane at Lot 42 Texas ,Hda. Luisita, San Miguel, Tarlac



30 Days After Planting



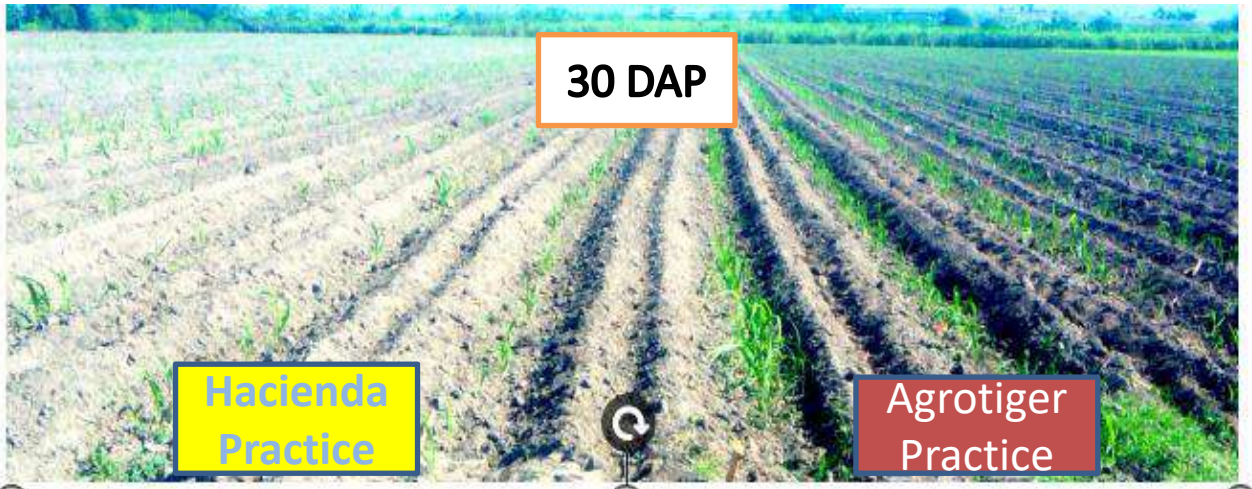
90 Days After Planting

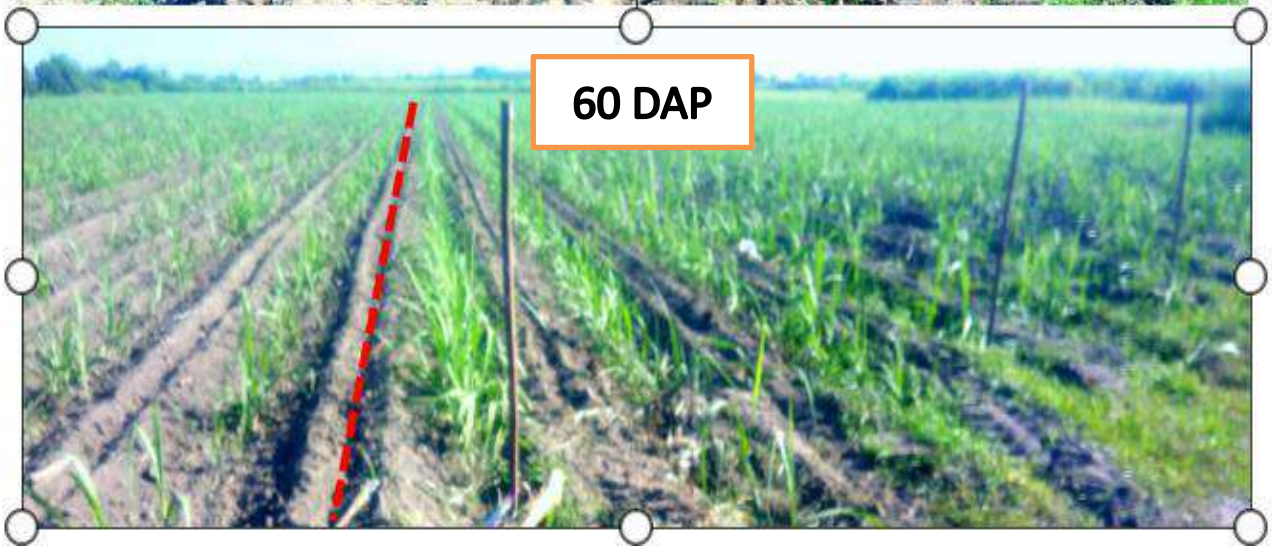
Notes on Slide no. 10

- The superiority of **Agrotiger fertilizer practice** is clearly shown in growth vigor and leaf color as early as 30 DAP. It appears in the Hacienda fertilizer practice that the nutrients applied during planting were consumed and lost already at 30 DAP specifically nitrogen from Urea

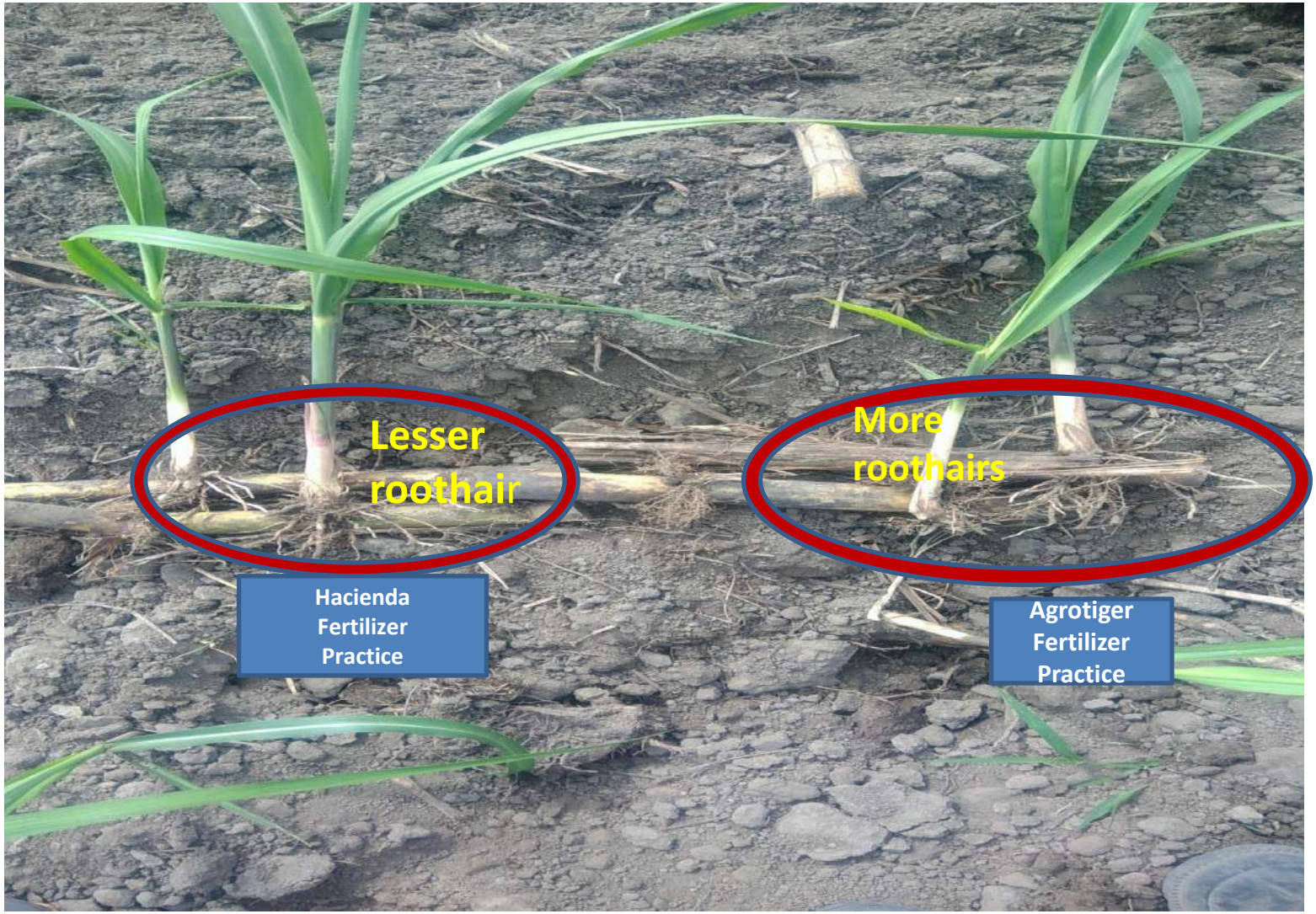
- The **controlled release property** of **Hyferureamax** ,the growth promoting property of **Mycorrhiza**, and the soil conditioning function of **Humic acid** were the reasons for the more luxuriant growth of canes in **Agrotiger Fertilizer practice.**

Mapalacsiao demo. Lot 93
840 meters/row x 7 rows

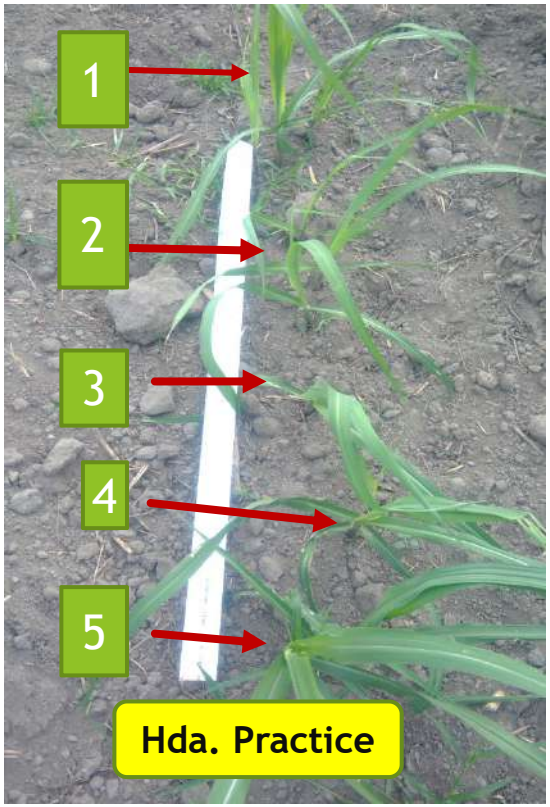


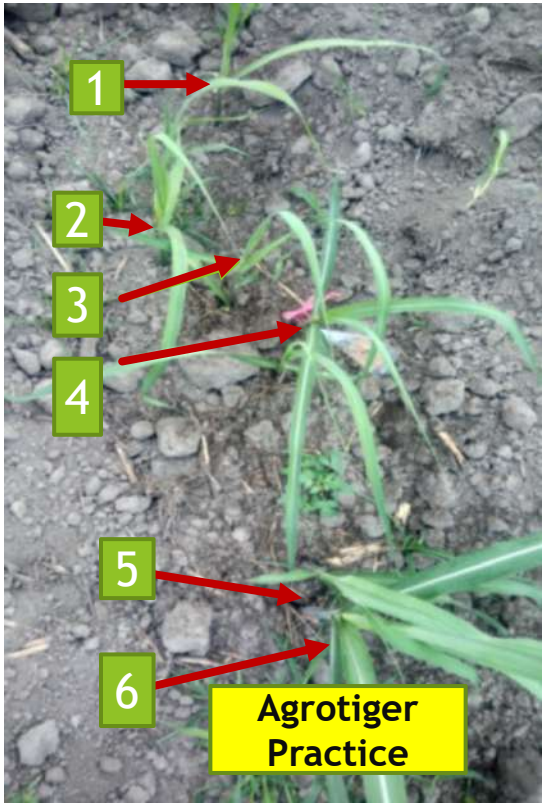


Root system at 30 DAT



Number of shoots per square meter at 30 DAP





Growth and Vigor Parameters: Number of shoots/square meter, length and diameter of middle leaves and number of leaves per shoot

- Six (6) shoots from Agrotiger practice emerged as of 30 DAP compared to only five (5) from Hacienda practice. The 0ne (1) shoot difference/sq.m. is significant considering the fact that it is equivalent to 10,000 more shoots per hectare.
- More robust growth and wider and longer leaves were also observed in Agrotiger fertilized canes. The reason for this is the production of more roothairs rather than bigger roots as due Mycorrhiza and Humium. Mycorrhiza fungus is known to associate with root tips and produce network of filaments making it possible for plants to absorb available nutrients by sequestering available moisture from the soil, hence the production of more roothairs. Bigger root and less roothairs as produced in Hacienda practice indicate that the canes need more moisture as it cannot efficiently absorb them hence the production of less roothairs and more bigger roots. Bigger roots are responsible for water absorption while roothairs absorb nutrients.

Number of shoots/ sq.m.

Number of shoots/ sq.m.

	30 DAP	60 DAP	90 DAP	120 DAP	150 DAP	180 DAP
Hda. Prac	**5.4**	**9.3**	**14.6**	**14.9**	**14.5**	**14.7**
Agrotiger	**6.3**	**12**	**15**	**15**	**21**	**21.0**
A + foliar	**6**	**12.5**	**15**	**15**	**21**	**21**

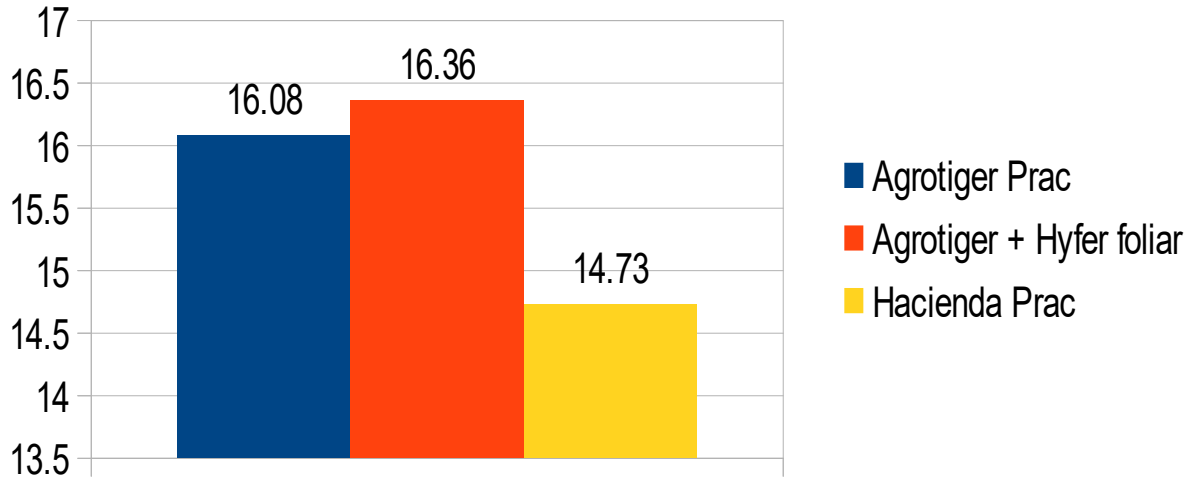
Ave. from 25 randomly tagged 1 linear meter hill cluster

Ave. number of shoots per linear meter. Texas demo. Lot 42.

Practice	30 DAP	60 DAP	90 DAP	120 DAP	150 DAP	180 DAP
Hda. Prac	5.4	8.3	14.6	14.9	14.5	14.7
Agrotiger fertilizer	6.3	11	15	15	16	16.0
Agrotiger fert.+Hyfer foliar	6	12	15	15	16	16.3

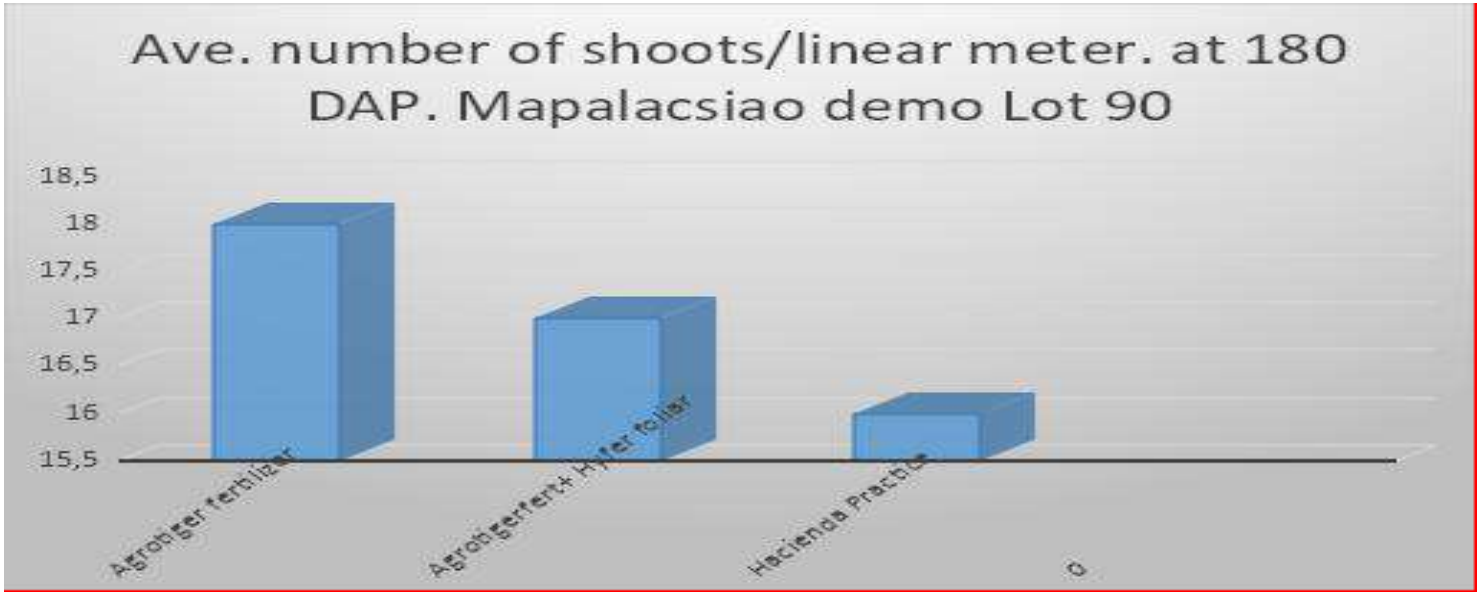
Ave. number of shoots/linear meter At 180 DAP, Lot 42, Texas demo.

Agrotiger Prac	Agrotiger + Hyfer foliar	Hacienda Prac
16.08	16.36	14.73



Ave. number of shoots at 180 DAP, Mapalacsiao demo. Lot 93

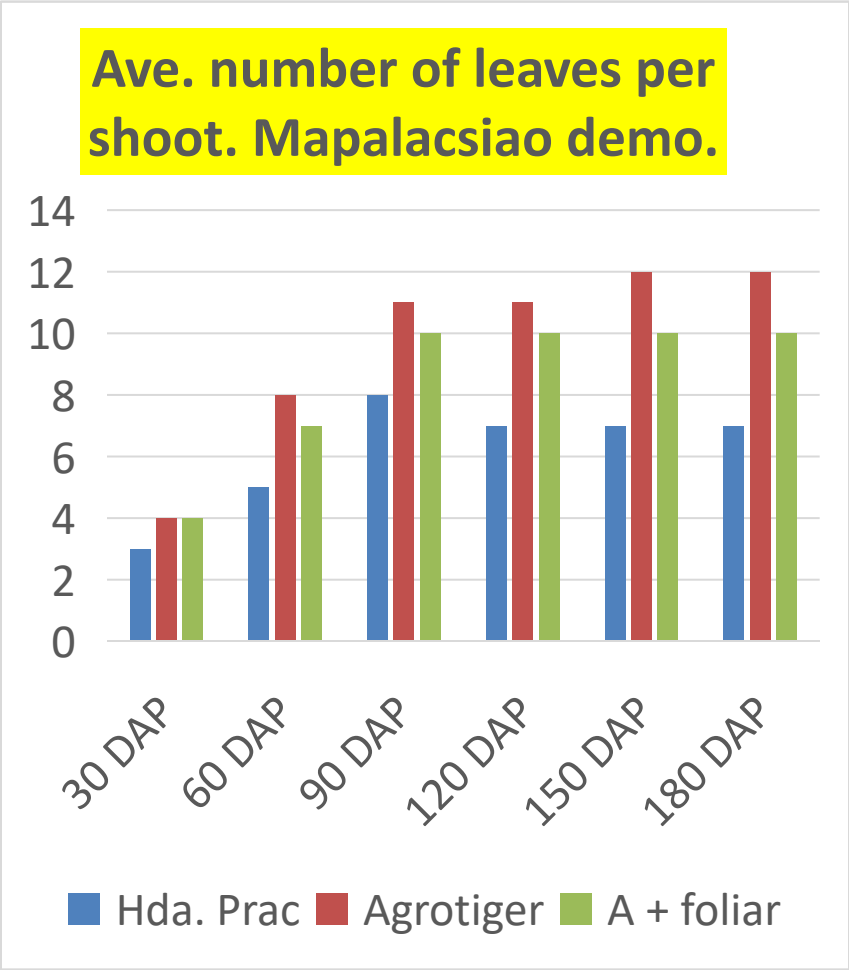
Agrotiger fertilizer	Agrotiger fert+ Hyfer foliar	Hacienda Practice
18	17	16



Ave. from 25 randomly tagged 1 linear meter hill cluster

Ave. number of leaves per shoot. Mapalacsiao demo

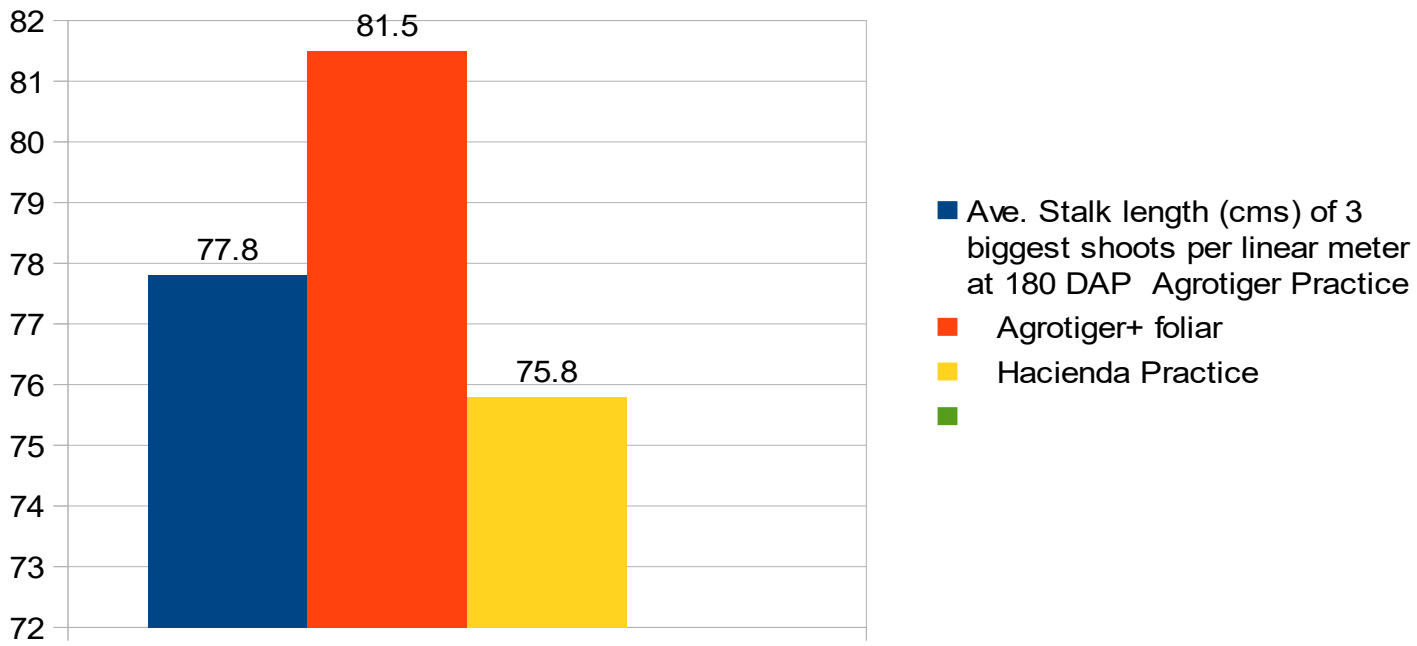
	ave. number of leaves per shoot					
	30 DAP	60 DAP	90 DAP	120 DAP	150 DAP	180 DAP
Hda. Prac	3	5	8	7	7	7
Agro tiger	4	8	11	11	12	12
A + folia r	4	7	10	10	10	10



Ave. from 25- 1meter hill cluster

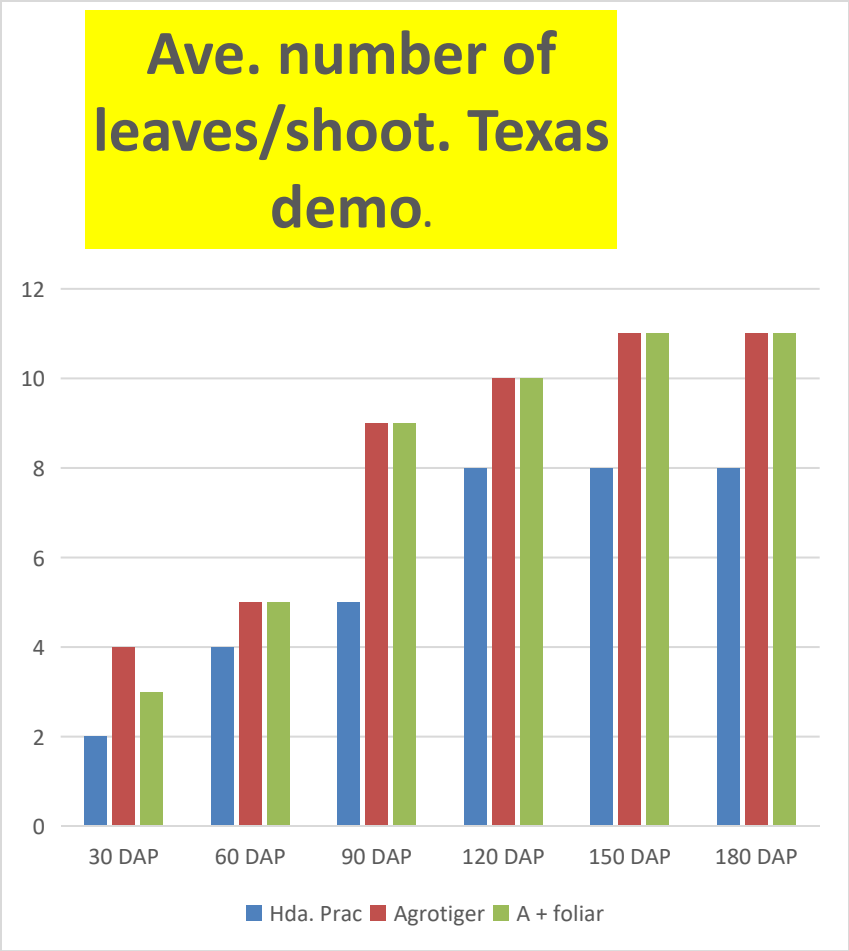
Ave. stalk length (cms) of 3 biggest shoots/linear meter at 180DAP Lot42 Texas demo.

Agrotiger Practice	Agrotiger+ foliar	Hacienda Practice
77.8	81.5	75.8



Ave, number of leaves/shoot. Texas demo.

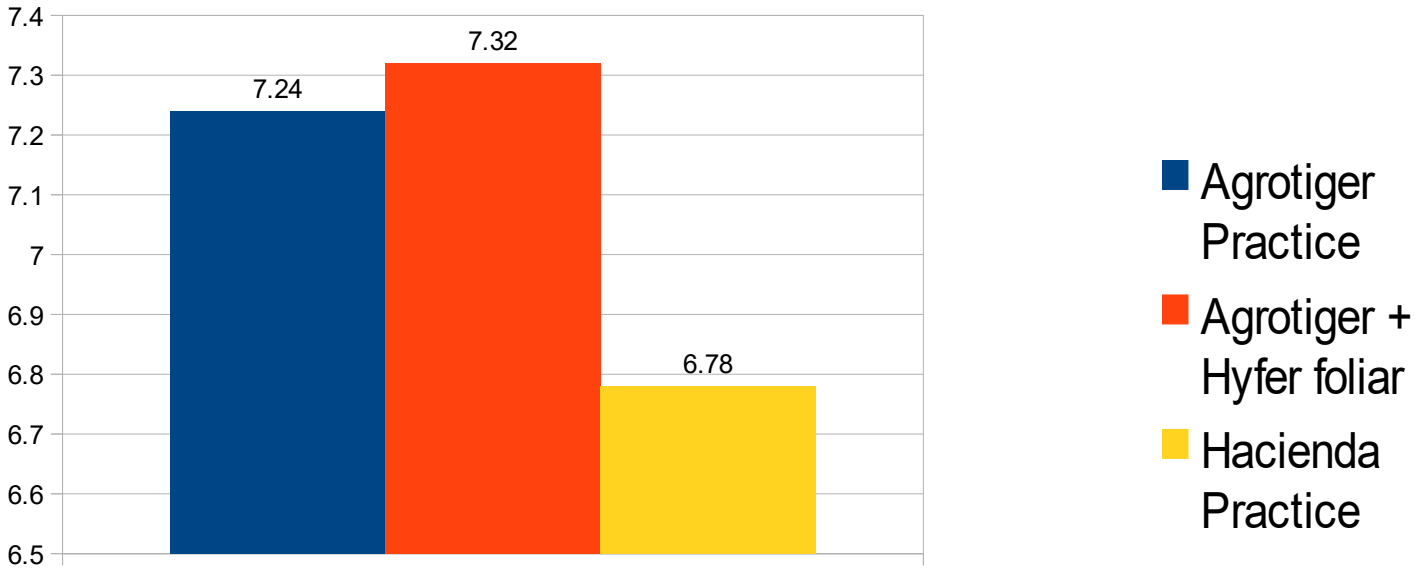
	30 DAP	60 DAP	90 DAP	120 DAP	150 DAP	180 DAP
Hda. Prac	2	4	5	8	8	8
Agro tiger	4	5	9	10	11	11
A + foliar	3	5	9	10	11	11



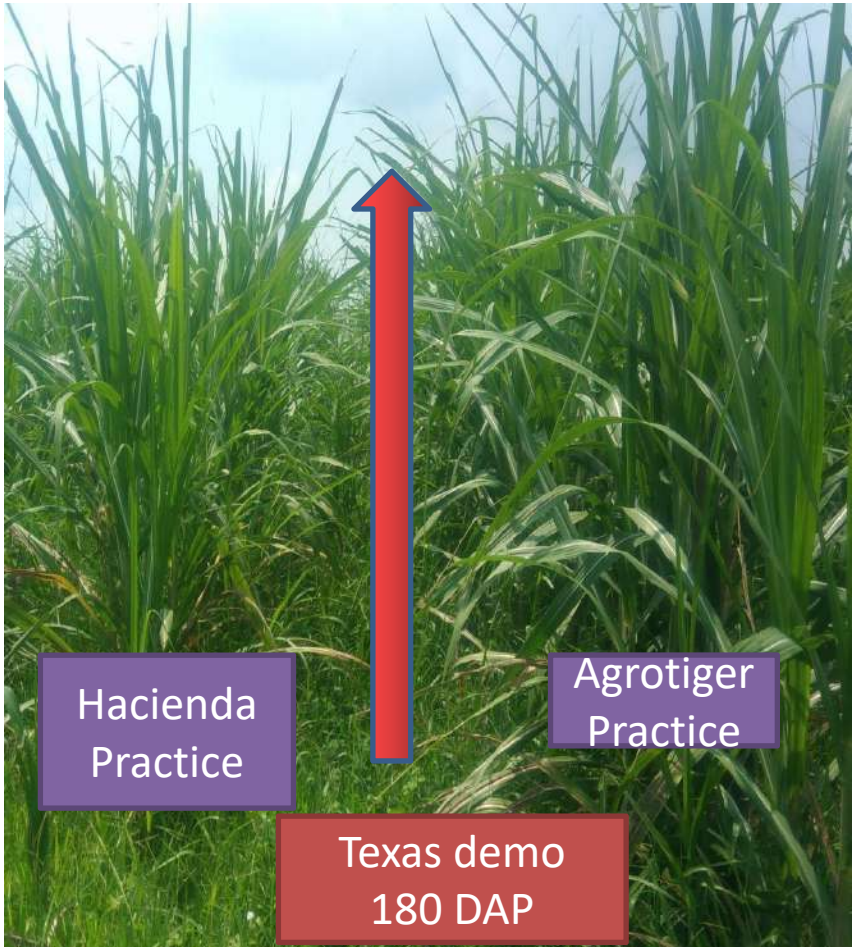
Ave. from 25- 1meter hill cluster

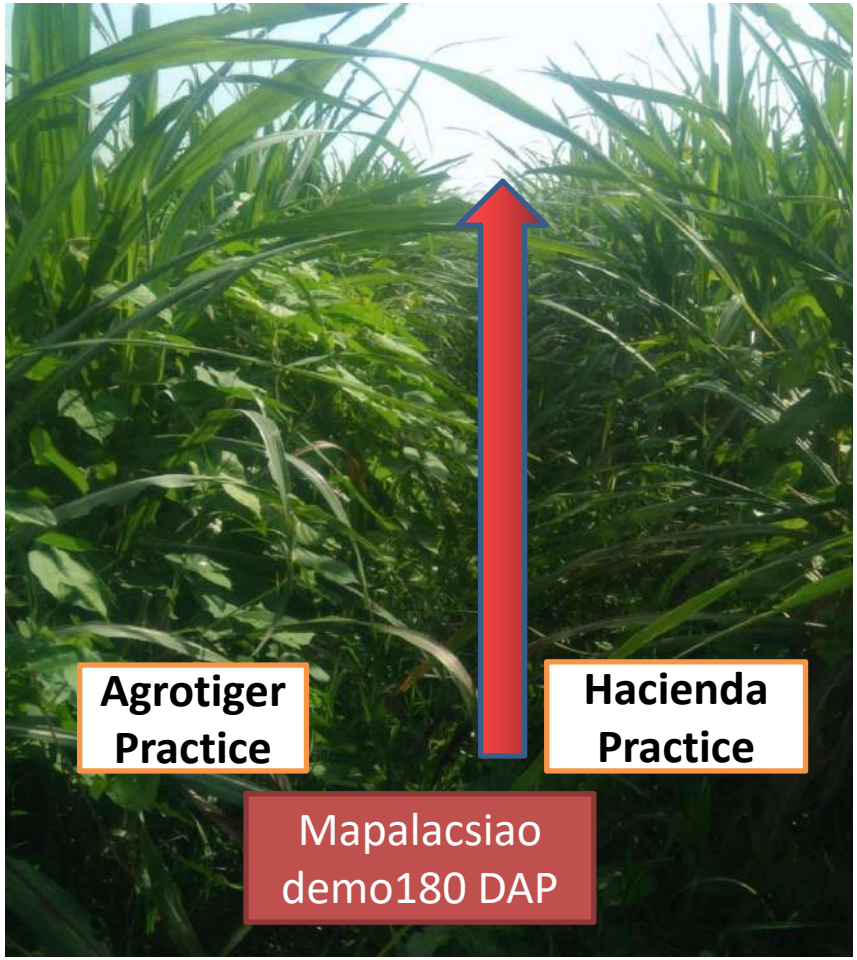
Ave. shoot circumference (cms) of 3 biggest shoots/ linear meter. Lot 42. Texas demo.

Agrotiger Practice	Agrotiger + Hyfer foliar	Hacienda Practice
7.24	7.32	6.78



Agrotiger fertilizer demo. 180 DAP





Mapalacsiao/ Texas 180 DAP

Agrotiger Practice

Agrotiger fert.+Hyfer foliar

Hacienda Practice

Attachment1 Compilation of Refractometer reading, Texas Lot42 demo.

Refractometer reading Texas demo. Lot 42

Date	Treatment	Sample	Percent (%) sugar content			
11/26/2021	Agrotiger fert.	Stalk no.	Bottom	Middle	Top	Ave
333 DAP		1	20,0	18	16	18
		2	21	20	18	20
		3	21	19	16	19
		Ave.	21	19	16	19
11/26/2021	Agrotiger fert.	Stalk no.	Bottom	Middle	Top	Ave.
333 DAP	plus Hyfer foliar	1	23	20	19	21
		2	21	19	17	19
		3	20	19	19	20
		Ave.	21.7	19.3	18.3	20
11/26/2021	Hacienda	Stalk no.	Bottom	Middle	Top	Ave
333 DAP	Practice	1	20	21	18	19
		2	20	19	17	19

Date	Treatment	Sample	Percent (%) sugar content			
12/11/2021	Agrotiger fert.	Stalk no.	Bottom	Middle	Top	Ave
347 DAP		1	24,0	24	23	24
		2	25	25	24	25
		3	25	25	25	25
		Ave.	25	25	24	25

11/26/2021	Agrotiger fert.	Stalk no.	Bottom	Middle	Top	Ave.
347 DAP	plus Hyfer foliar	1	25	25	25	25
		2	25	25	24	25
		3	25	25	24	25
		Ave.	25	25	24,0	25
12/11/2021	Hacienda	Stalk no.	Bottom	Middle	Top	Ave
347 DAP	Practice	1	23	22	22	22
		2	23	23	22	23
		3	23	22	22	22
		Ave.	23	22	22	22

12/04/2021	Agrotiger fert.	Stalk no.	Bottom	Middle	Top	Ave.
340 DAP		1	22	22	21	22
		2	20,0	20	19	20
		3	20	19	19	19
		Ave.	20,7	20	20	20
12/04/2021	Agrotiger fert.	Stalk no.	Bottom	Middle	Top	Ave
340 DAP	plus Hyfer foliar	1	23	21	21	22
		2	23	22	22	22
		3	23	23	21	22
		Ave.	23	22	21,3	22
12/04/2021	Hacienda	Stalk no.	Bottom	Middle	Top	
340 DAP	Practice	1	22	21	20	21
		2	22	21	21	21
		3	22	22	22	22
		Ave.	22	21.3	21	21

Attachment 2. Compilation of Refractometer readings, Mapalacsiao demo.

12/04/2021	Agrotiger fert.	Stalk no.	Bottom	Middle	Top	Ave.
330 DAP		1	24	24	21	23
		2	23,0	22	22	22
		3	24	23	23	23
		Ave.	23,7	23	22	23
12/04/2021	Agrotiger fert.	Stalk no.	Bottom	Middle	Top	Ave
330 DAP	plus Hyfer foliar	1	21	21	19	20
		2	21	20	20	20
		3	23	21	20	21
		Ave.	22	21	19.7	21
12/04/2021	Hacienda	Stalk no.	Bottom	Middle	Top	Ave
330 DAP	Practice	1	22	21	16	20
		2	21	20	16	19
		3	19	16	15	17
		Ave.	21	19	16	18

12/11/2021	Agrotiger fert.	Stalk no	Bottom	Middle	Top	Ave.
337 DAP		1	25	25	24	25
		2	24,0	24	24	24
		3	25	25	25	25
		Ave.	25,0	25	24	25
12/11/2021	Agrotiger fert.	Stalk no	Bottom	Middle	Top	Ave
337 DAP	plus Hyfer foliar	1	24	24	23	24
		2	24	24	24	24
		3	24	23	23	23
		Ave.	24	24	23,0	24
12/04/2021	Hacienda	Stalk no	Bottom	Middle	Top	Ave
337 DAP	Practice	1	23	22	17	21
		2	22	21	17	20
		3	20	17	16	18
		Ave.	22	20	17	19

Number of millable stalks and weight/stalk at harvest

Number of millable cane stalk per linear meter at 337 DAP, Texas demo.Lot 42

Treatment	1	2	3	4	5	Average
Agrotiger fert.	15	10	12	11	13	12
Agrotiger +Hyfer foliar	13	15	11	10	13	13
Hacienda Practice	11	12	13	11	10	11

Number of millable cane stalk per linear meter at 337 DAP, Mapalacsiao

Treatment	1	2	3	4	5	Average
Agrotiger fert.	14	15	10	12	14	13
Agrotiger +Hyfer foliar	17	16	15	14	15	15
Hacienda Practice	12	15	17	15	12	14

Average weight (gms) of millable cane at 337 DAP, Texas demo. Lot 42

Treatment	1	2	3	Average
Agrotiger fert.	529	676	714	640
Agrotiger +Hyfer foliar	817	756	701	758
Hacienda Practice	649	686	532	622

Attachment n.

Number of millable cane stalk per linear meter at 360 DAP, Texas demo.Lot 42

Treatment	1	2	3	4	5	Average
Agrotiger fert.	15	10	12	11	13	12
Agrotiger +Hyfer foliar	13	15	11	10	13	13
Hacienda Practice	11	12	13	11	10	11

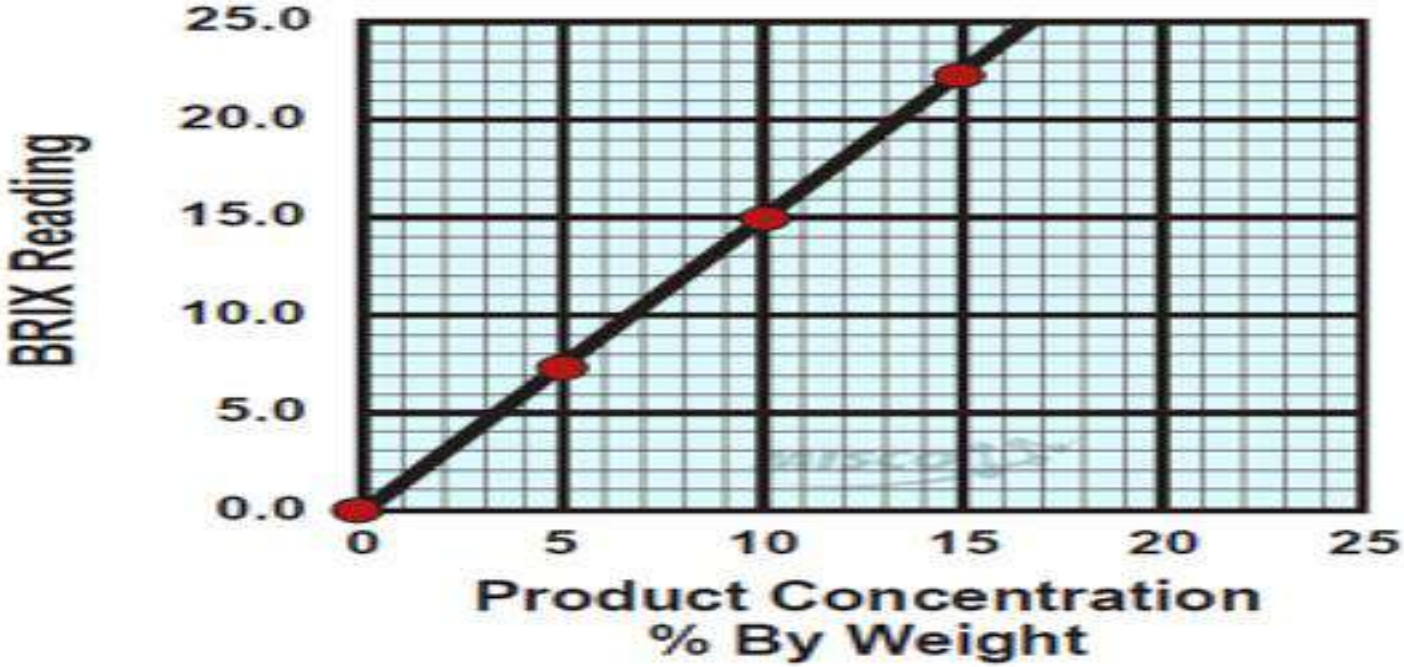
Number of millable cane stalk per linear meter at 360 DAP, Mapalacsiao

Treatment	1	2	3	4	5	Average
Agrotiger fert.	14	15	10	12	14	13
Agrotiger +Hyfer foliar	17	16	15	14	15	15
Hacienda Practice	12	15	17	15	12	14

Average weight (gms) of millable cane at 360 DAP, Texas demo. Lot 42

Treatment	1	2	3	Average
Agrotiger fert.	529	676	714	640
Agrotiger +Hyfer foliar	817	756	701	758
Hacienda Practice	649	686	532	622

Charting Solution Concentrations Using a Refractometer



https://www.misco.com/digital-refractometer-training/the-art-of-the-chart-charting-solution-concentrations-using-a-refractometer/

Average weight of millable canes at 347DAP, Mapalacsiao demo

Treatment	1	2	3	Average
Agrotiger fert	709	718	837	755
Agrotiger +Hyfer foliar	806	722	618	715
Hacienda Practice	809	735	616	720

Average size and weight of harvestable stalks, Texas demo. Lot. 42			
Treatments	Length (cms)	Circumference (cms)	Weight (gms)
Agrotiger fert.			
1	240	6	817
2	243	7	756
3	239	7	701
Ave.	241	7	758
Agrotiger fert.			
plus Hyfer foliar			
1	243	7	529
2	246	7	676
3	248	6	714
Ave.	246	7	640
Hacienda Prac.			
1	230	7	615
2	243	6	646
3	238	6	604
Ave.	237	6	622

Average size and weight of harvestable stalks,Mapalacsiao demo. Lot. 42			
Treatments	Length (cms)	Circumference (cms)	Weight (gms)
Agrotiger fert.			
1	246	7	709
2	242	7	618
3	238	7	637
Ave.	241	7	655
Agrotiger fert.			
plus Hyfer foliar			
1	245	7	806
2	249	7	722
3	248	6	618
Ave.	247	7	715
Hacienda Prac.			
1	235	6	605
2	245	7	620
3	235	7	610
Ave.	238	7	612

One cluster hill

Number of harvestable canes per hill cluster, Texas Lot 42

Sample Hill cluster	**Agrotiger fert**	**Agrotiger fert**	**Hacienda**
Number		plus Hyfer foliar	Practice
1	15	15	11
2	10	15	12
3	12	11	13
4	11	10	11
5	13	13	10
Ave	**12**	**13**	**11**

Number of harvestable canes per hill cluster, Mapalacsiao.

Sample hill cluster	Agrotiger fert	Agrotiger fert plus Hyfer foliar	Hacienda Practice
1	13	17	12
2	15	16	15
3	10	15	15
4	12	14	15
5	14	15	12
Ave	13	15	14

Agrotiger fert+Hyfer foliar

Hacienda Practice

Brix reading and sucrose content per cane

Treatment	Refractometer	sugar content	ave. weight/cane	gms sucrose
Texas demo.	reading	(%)	(grams)	per cane
Agrotiger fertilizer	20	13	758	99
Agrotiger fert pLus				
Hyfer foliar	22	15	640	96
Hacienda practice	21	14	622	87

Brix reading and sucrose content per cane

Treatment	Refractometer	sugar content	ave. weight/cane	gms sucrose
Mapalacsiao demo	reading	(%)	(grams)	per cane
Agrotiger fertilizer	24	17	755	128
Agrotiger fert pLus	25	16	715	114
Hyfer foliar				
Hacienda practice	19	13	720	93

Cane yield (tons/ha.) and sugar (50 kg. bag /ha.), Texas Lot 42

Treatment	Cluster hills	Millable canes	Millable canes	Weight (kgs)	Yield/ha.	Sucrose	Yield/ha.	50 kg.bag
Texas Lot 42	per hectare	per hill cluster	per hectare	per cane	(tons)	Content (%)	kgs sugar	per ha.
Agrotiger fertilizer	5,600	12	67,200	0.758	50.9	13	6,617	132
Agrotiger fert pLus								
Hyfer foliar	5,600	13	72,800	0.640	46.5	15	6,975	140
Hacienda practice	5,600	11	61,600	0.622	38.3	14	5,446	108

Cane yield (tons/ha.) and sugar (50 kg. bag /ha.), Mapalacsiao demo

Treatment	Cluster hills / na.	Millable canes/hill cluster	Millable canes/ha.	Weight (kgs)/cane	Yield/ha. (ton cane)	Sucrose Content per cane (%)	Yield/ha. (kgs. sugar)	50 kg.bag/ha.
Agrotiger fertilizer	5,600	13	72,800	0.758	55,182	17	9,380	188
Agrotiger fert pLus Hyfer foliar	5,600	15	84,000	0.640	53,760	16	8,601	172
Hacienda practice	5,600	14	78,400	0.622	48,764	13	6,339	127

Cost and Return Analysis Texas Lot 42

Treatment	Yield (LKG sugar/ha)	Yield (Pesos) at P1492/LKG	Cost of Production	Net income per ha.	Benefit: Cost Ratio
Agrotiger fertilizer	132	196,944	79,164	117,790	1.49
Agrotiger fert pLus Hyfer foliar	140	208, 880	79,164	129,716	1.63
Hacienda practice	108	161,136	79,164	81,972	1.03

Cost and Return Analysis Mapalacsiao Demo.

Treatment	Yield (LKG sugar/ha)	Yield (Pesos) at P1492/LKG	Cost of Production	Net income per ha.	Benefit: Cost Ratio
Agrotiger fertilizer	188	250,656	79,164	171492	2.1
Agrotiger fert pLus Hyfer foliar	172	256,624	79,164	177,460	2.4
Hacienda practice	127	189,484	79,164	110,310	1.3

Important Considerations

Assumptions:

Peripheral area in one (1) hectare sugarcane.....4 meter wide x 1000 meter length x 4 = 1,600 sq.m.

Net area planted to cane in a hectare .....10,000 sq.m. less 1,600 sq.m. or 8,400 sq.m.

Plant spacing is 1.5 meters/3 seed pieces or 1 meter length or 1.5 sq. m. area per hill cluster

Number of hill cluster per hectare is 8,400 sq. m. divide by 1.5 sq. m. or 8400/1.5 or 5,600 hills

Computations

Millable canes per ha. = 5.600 cluster hills/ha. x millable canes per cluster hill

Yield (ton cane/ha.)=number of millable canes/ha x weight in kgs per millable cane

Yield (kgs. sugar/ha.) = ton cane/ha x % sugar content per cane

LGK sugar/ha.- sugar yield/ha divide by 50kgs. sugar / bag

Net income = Yield in pesos/ha minus Cost of Production/ha.

Benefit:Cost Ratio = Net income/ha divide by Cost of Production/ha.