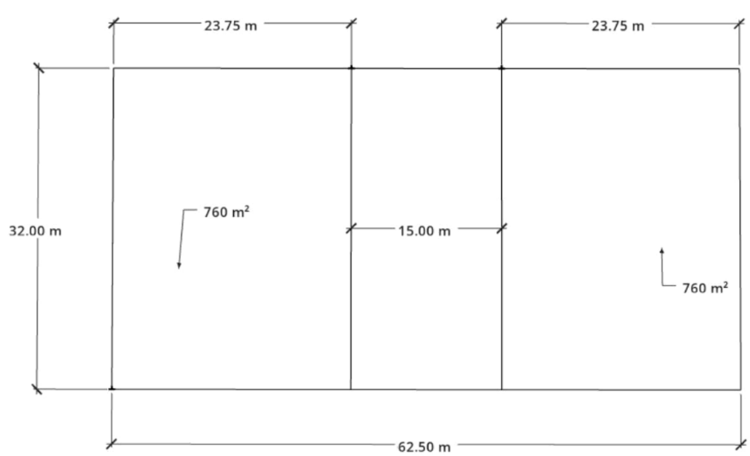
Corn – Colombia – Santander Univ. – Dr. Hernandez – 2025

Overview

- Researcher: Daniel Antonio Hernández Villamizar
- Institute: Francisco de Paula Santander University, Colombia
- Goal of Trial: This scientific trial was carried out with the objective of evaluating the effect of Kyminasi® Crop Booster™ (KCB) technology on vegetative growth, structural parameters and bromatological composition of the corn crop (creole[1] variety) under controlled field conditions in Ocaña, Norte de Santander.
- Report Date: June 2025

Location

- Santander North Branch, Ocaña, Colombia
- Total area: 2000 m²
- Plot 1 – *without Crop Booster* – Area: 760 m²
    - Dimensions: 32 m x 23.75 m
    - Separation path: 15 m
- Plot 2 – *with Crop Booster* – Area: 760 m²
    - Dimensions: 32 m x 23.75 m
- Number of rows: 32
- Distance between rows: 0.8 m
- Plants per site: 2



[1] "Creole corn" is highly popular and widely cultivated in Latin America, where the term "creole" (or criollo – native, heirloom) refers to the traditional, locally adapted corn varieties developed by farmers over millennia. These native varieties are a cornerstone of Latin American agriculture and cuisine, particularly for small-scale and family farmers who rely on them for food security, cultural traditions, and economic sustenance.

Species

- Crop: Corn
- Variety: Creole (Criollo)

Irrigation

- Type: Flood
- Number of irrigations: 4
- Germination percentage: 72%

Time

- Start Date: March 11, 2025
- Completion Date: June 27, 2025

Trial Details

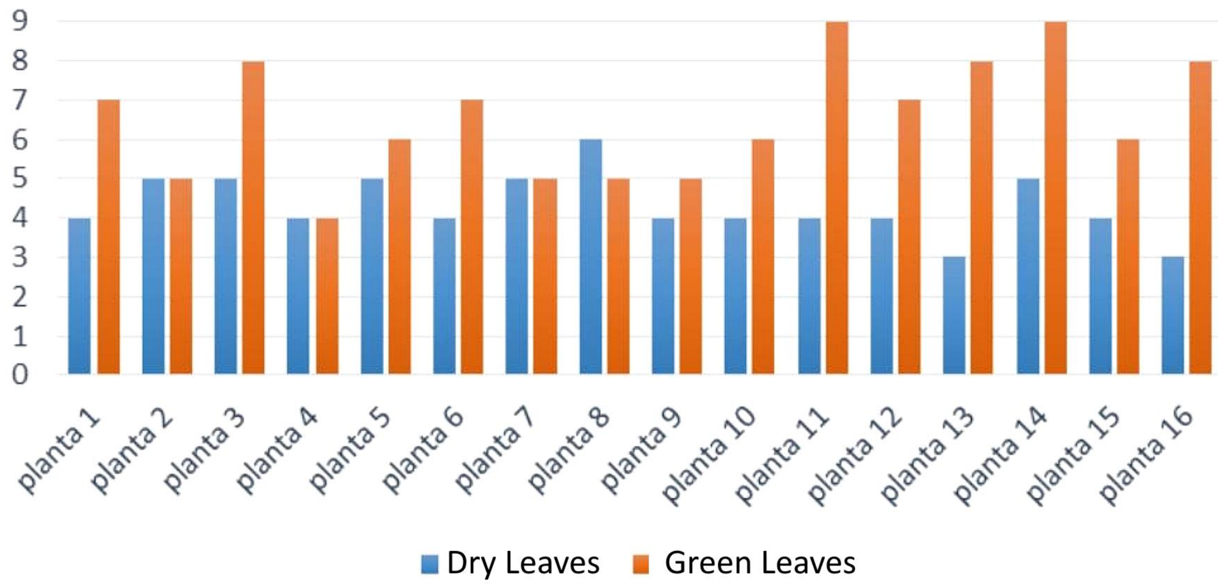
- Two experimental plots of 760 m² each were established: a control plot without technology and another with the Crop Booster technology installed in the irrigation system, maintaining the same agroecological conditions. The vegetative cycle lasted 108 days with four scheduled irrigations and an average germination rate of 72%.

- During the trial, morphological variables were recorded (plant height, stem diameter, number of green and dry leaves, leaf dimensions and number of rows per ear) and bromatological analyses of the different fractions of the crop (stem, green leaves, dry leaves, husk and grain) were performed, using the AOAC methods 934.01, 920.39, 942.05, 2001.11 and 985.29.

- The results showed that Crop Booster technology generated significant physiological and nutritional improvements in corn, evidenced by a greater proportion of green leaves, increased stem diameter, height and number of rows per ear, as well as improvements in bromatological parameters, especially in crude protein and dry matter, with a reduction in crude fiber and ash.

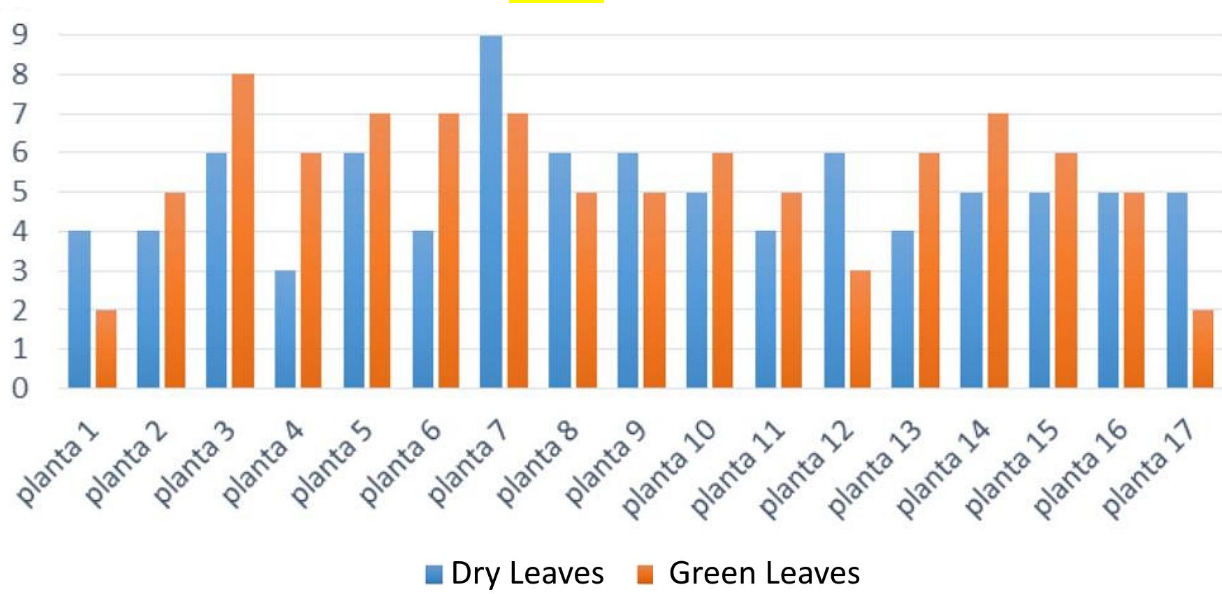
Results

Figure 1. Corn cultivation with Crop Booster technology



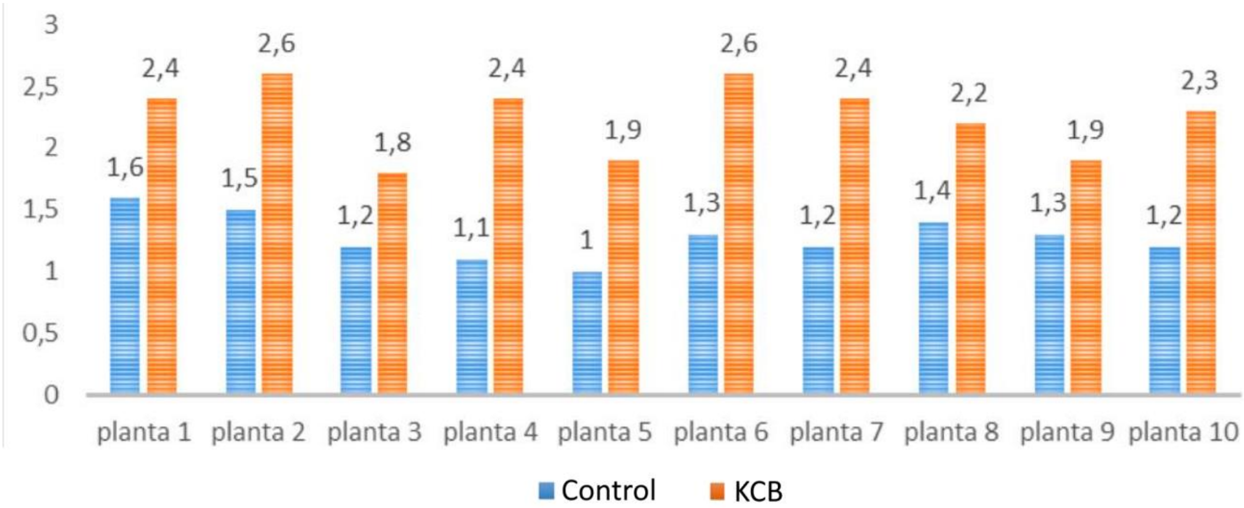
A balance is observed in the ratio of green leaves to dry leaves, with green leaves predominating in most KCB plants. This indicates a prolonged active vegetative state, greater photosynthetic efficiency, and better nutrient utilization.

Figure 2. Corn cultivation without Crop Booster technology (Control)



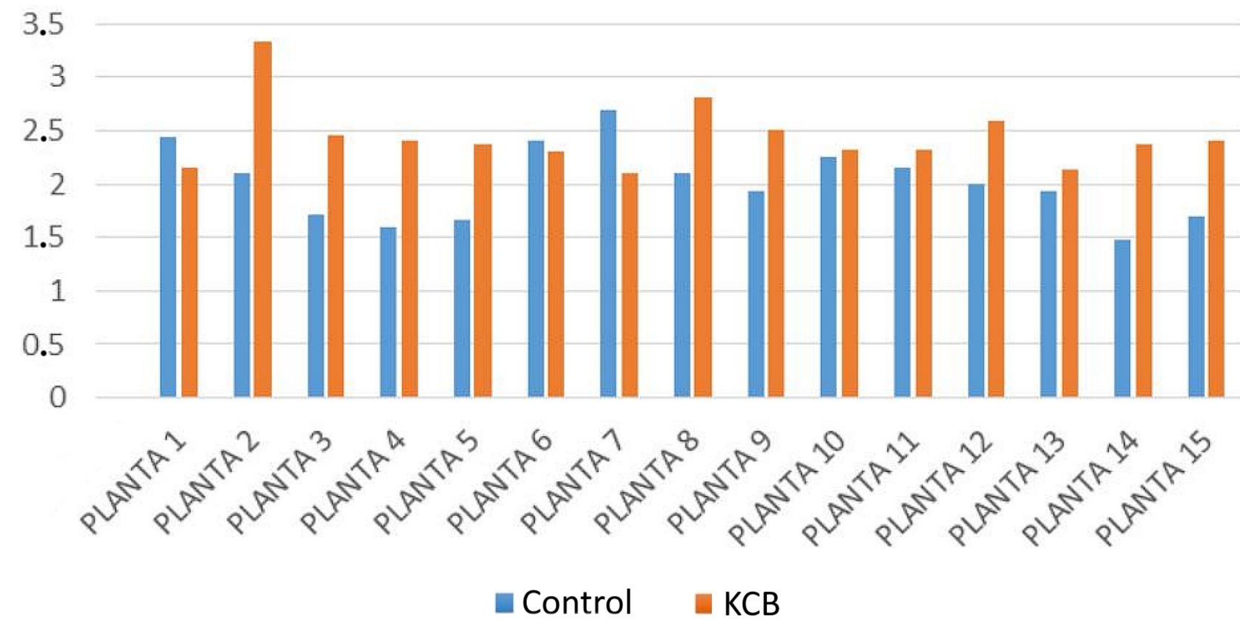
The control plants show a greater number of dry leaves and variability between plants, reflecting accelerated leaf senescence and lower vegetative vigor, which suggests lower photosynthetic capacity and possible physiological limitations.

Figure 3. Stem diameter (cm)



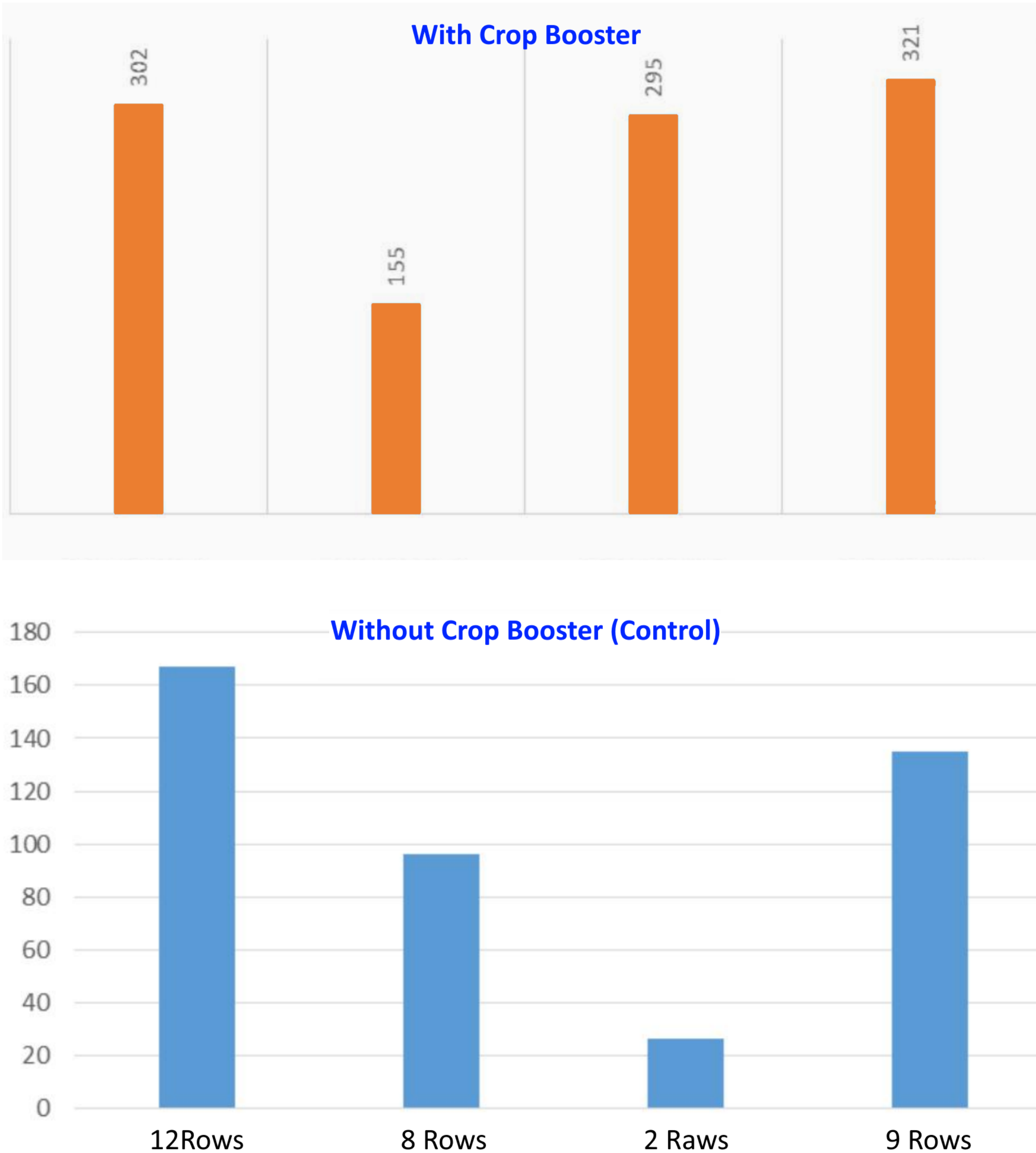
Plants treated with Crop Booster have stems with a larger diameter (2.0–2.6 cm) than the control (1.1–1.8 cm), which shows better structural development and greater capacity for transporting water and nutrients.

Figure 4. Plant height (m)



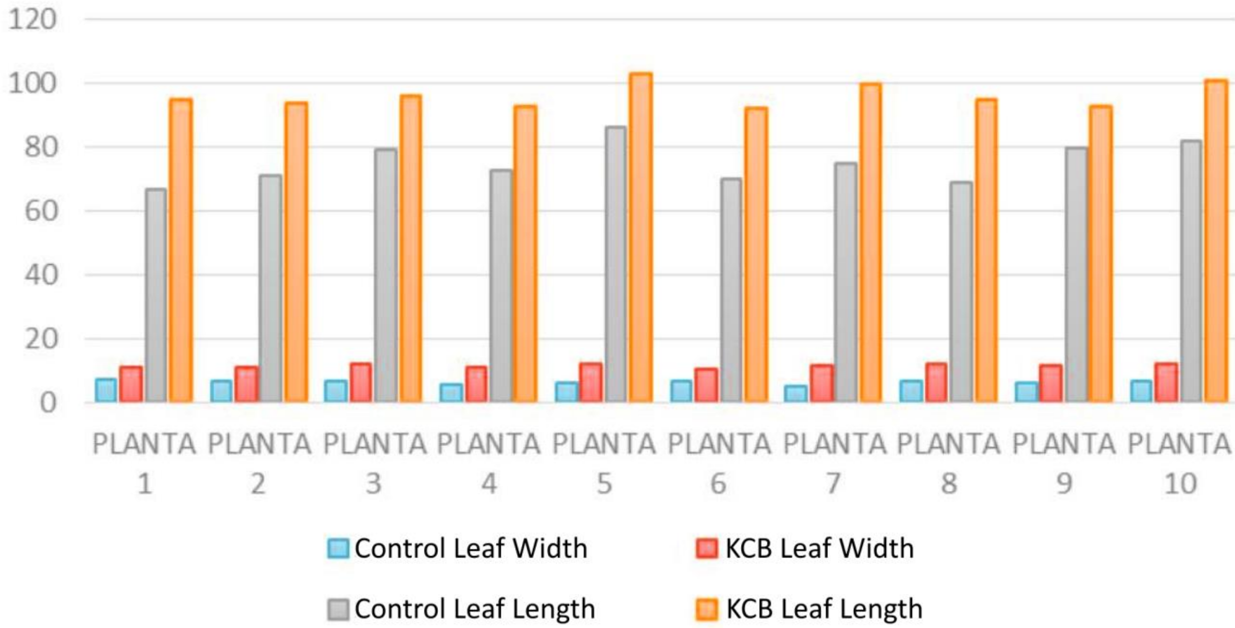
An increase in the height of the treated plants (2.8–3.5 m) was observed compared to the control. This reflects more vigorous and balanced growth, without loss of structural stability.

Figure 5. Number of rows of kernels per ear



Ears treated with *Crop Booster* have a greater number of rows (11–12) and higher grain counts (295–321) compared to the control (2–12 rows), indicating better filling and fertility.

Figure 6. Width and length of the sheet (cm)



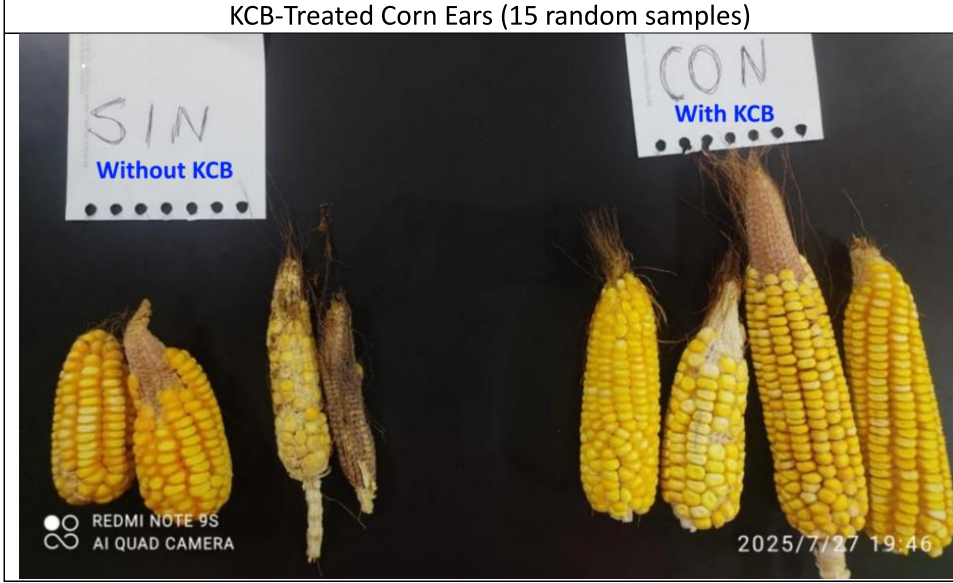
The treated plants have longer (95–105 cm) and wider (12–15 cm) leaves than the control, increasing the effective leaf area and the total photosynthetic capacity of the crop.

Kernel count per ear: Control vs. *Crop Booster*

Control vs. *Crop Booster:* Bigger Cobs without Deformities

Untreated Corn Ears (12 random samples)


KCB-Treated Corn Ears (15 random samples)



Conclusions

Based on the data and observations recorded during the trial period, the following conclusions were drawn by the researchers:

- The application of *Crop Booster* technology to native corn varieties under controlled field conditions demonstrated positive impacts on the plant's morphological development and nutritional composition. Structural parameters – height, stem diameter, and leaf area – increased significantly, accompanied by a greater number of rows and kernels per ear.

- From a nutritional standpoint, treatment with *Crop Booster* increased the dry matter, ether extract, and crude protein content, while simultaneously reducing crude fiber and ash. These changes suggest a more efficient plant metabolism and tissues with greater digestive and nutritional value.

- Overall, the results indicate that in agronomic and nutritional terms, *Crop Booster* technology contributed to an improvement in the physiology and potential yield of the crop, increasing its productivity and quality, with direct implications for the efficiency of the production system and the quality of the harvested material.

Final Observations

The researchers' final observations were (full quote):

"The results obtained during this trial are considered scientifically consistent and reproducible within the established agroecological and management conditions."

"The *Crop Booster* technology showed sustained positive effects on the physiological, structural and bromatological variables of the crop, demonstrating coherence between the agronomic performance and the improvement in the nutritional quality of the plant material. No adverse incidents were recorded during the installation or operation of the device, and the agronomic management was homogeneous between treatments, which strengthens the comparative validity of the results."

"It is recommended to conduct further evaluations in different cycles and commercial varieties of corn to confirm the stability of the response under different soil and climate conditions."

Attachment

- "Results of Bromatological Analysis" by the Animal Nutrition Laboratory of Francisco de Paula Santander University, Ocaña, Colombia.

ANIMAL NUTRITION LABORATORY

Universidad Francisco de Paula Santander – Ocaña

RESULTS OF BROMATOLOGICAL ANALYSIS

Applicant / Instructor: Daniel Antonio Hernández Villamizar

Date: September 30, 2025

Sample: Corn (stem, green leaf, dry leaf, ear, husk) – Control treatment vs. Crop Booster technology

Location / Area / Course: Experimental farm / Goat project

	Parámetro									
	% Materia seca		% Extracto etéreo		% Cenizas		% Proteína cruda		% Fibra cruda	
Metodo empleado	A.O.A.C 934.01		A.O.A.C 920.39		A.O.A.C 942.05		A.O.A.C 2001.11		A.O.A.C 985.29	
Parte analizada	**Control**	**Crop Booster**	**Control**	**Crop Booster**	**Control**	**Crop Booster**	**Control**	**Crop Booster**	**Control**	**Crop Booster**
Tallo	32,35	27,66	0,85	1,00	6,00	5,50	4,87	5,42	30,32	28,91
Hojas verdes	33.15	35.36	1.76	2,00	8.50	10.00	10.13	11.37	27.23	25.81
Hojas secas	71,92	84,30	1,32	1,50	7,00	9,50	6,89	7,84	33,40	31,02
Mazorca (grano)	33,45	34,81	3,50	3,50	2,50	2,50	8,51	9,36	2,55	2,20
Capacho	25,46	27,13	0,30	0,50	4,00	3,50	5,49	6,02	34,11	31,97

Sub-samples were analyzed in triplicate for each parameter.
The results show that the use of Crop Booster technology produced slight improvements in the chemical composition of the different corn fractions. An increase was observed in the percentages of dry matter, ether extract, and crude protein, accompanied by a reduction in ash and crude fiber, indicating plant tissues with greater nutritional value and improved physiological efficiency.

Parameter Details

Dry Matter % (A.O.A.C 934.01):
The Crop Booster treatment increased dry matter in most plant parts, indicating a more uniform physiological maturity and better natural dehydration of tissues, without compromising the quality of the plant material.

Ether Extract % (A.O.A.C 920.39):
A slight increase in ether extract was observed in leaves and stems, reflecting greater synthesis of energy compounds (fats and cuticular waxes). This increase is favorable for the forage’s energy contribution.

Ash % (A.O.A.C 942.05):
Values remained within the normal range (2.5–10%). The slight decrease in stems and husks may be attributed to lower accumulation of non-structural minerals and dust, improving the nutritional purity of the biomass.

Crude Protein % (A.O.A.C 2001.11):
Protein content showed moderate increases (≈ +0.5 to +1 percentage point) across all tissues. This effect suggests better nitrogen assimilation and enhanced synthesis of plant proteins induced by the Crop Booster technology.

Crude Fiber % (A.O.A.C 985.29):
The systematic reduction in crude fiber (1–2 percentage points) indicates lower lignification of cell walls, which could improve digestibility and forage utilization by animals.

Conclusion

The obtained values demonstrate a positive trend of the Crop Booster technology treatment on the bromatological quality of corn. Increases were observed in dry matter, ether extract, and crude protein, together with reductions in crude fiber and ash, reflecting more balanced plant tissues with higher nutritional value for animal feeding purposes.

José Efraín Salcedo Paredes.

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