



Thesis Summary: Forage, ESPOCH – Ecuador, 2022



Time

2022

Location

Faculty of Livestock Sciences, Experimental Station "Tunshi",
Higher Polytechnic School of Chimborazo, Riobamba, Ecuador

Details

- Author: Marcia Gabriela Perez Quishpe
- Director: Eng. Pablo Rigoberto Andino Najera, Ms C
- The thesis aimed to investigate the efficacy of Kyminasi Plants Crop Booster (KPCB) technology in boosting plants growth and health parameters.

Species

- Rye grass (*Lolium perenne*)
- Lucerne (*Medicago sativa*)
- White clover (*Trifolium repens*)

Area

8900 m², divided into equal treated and untreated sections of 4450 m² (1.1 acre) each.

Results

Botanical composition of the forage mix

Variable	Treatment				Boost	
	KPCB (gr/m ²)	% of Mix	Control (gr/m ²)	% of Mix	in production	Change in %
% grasses	355.40	24.94	119.00	21.56	299%	+16%
% legumes	902.80	63.35	346.40	62.75	261%	+1%
% weeds	167.00	11.72	86.60	15.69	93%	-25%

Forage Mix

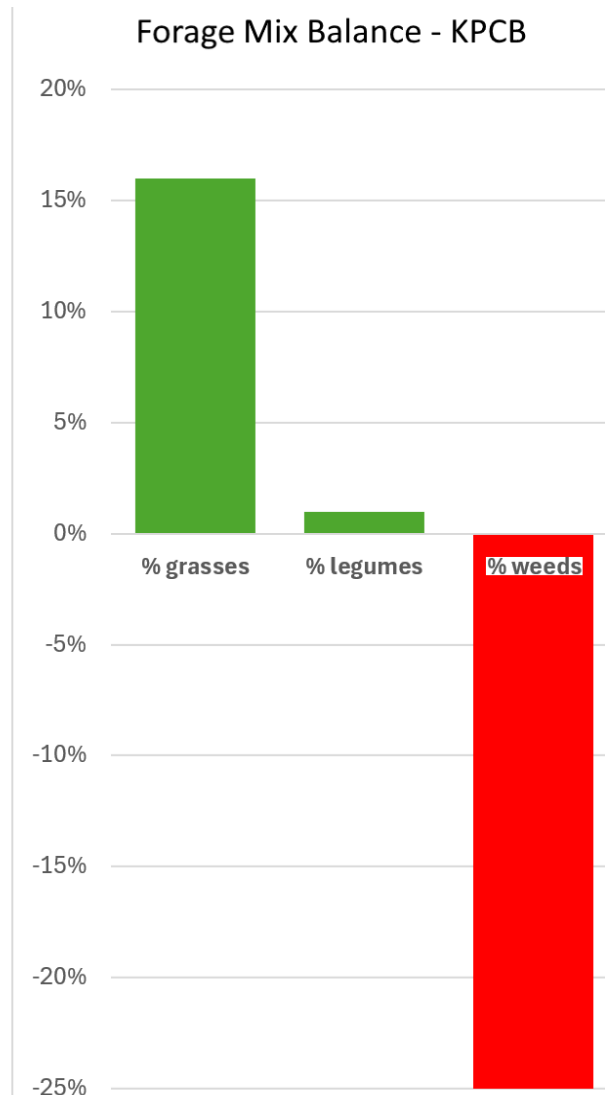
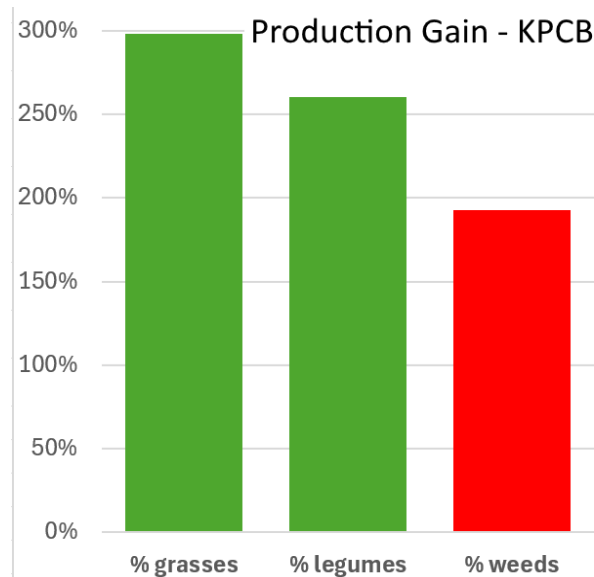
In the treated field the grasses yield was 299% when compared to Control, and legumes were 261% of same.

Weeds

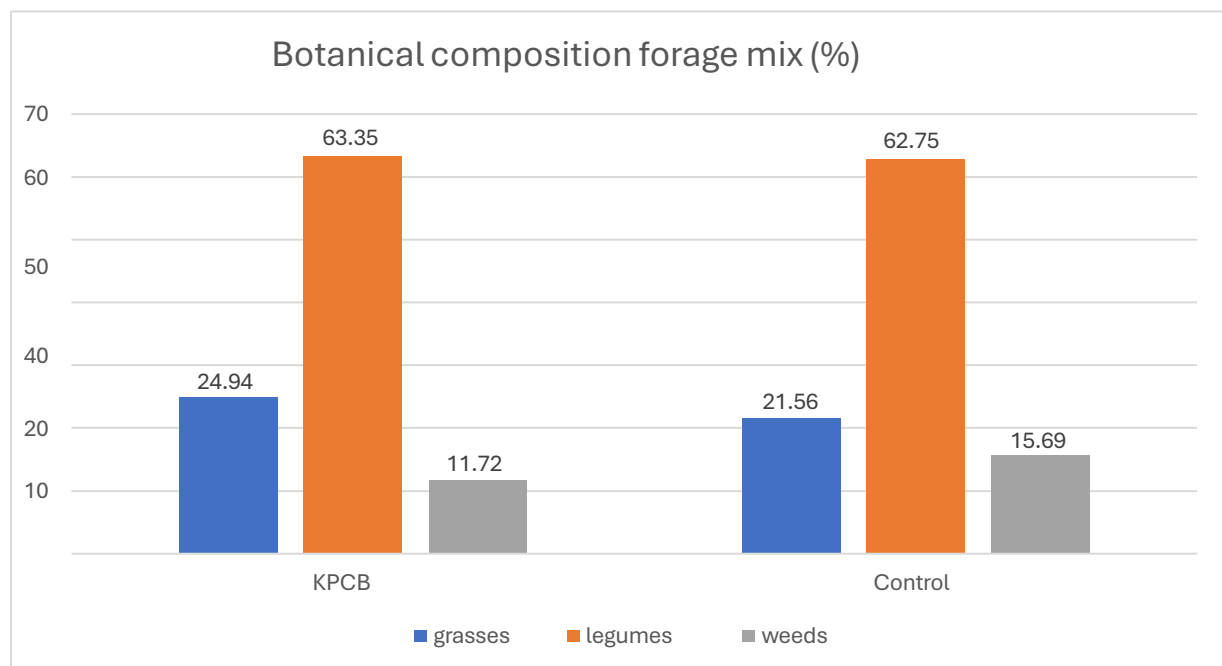
Since KPCB boosts all plants, it boosted the growth of weeds by 93%. However, in terms of percentage of the entire mix including weeds, the KPCB created an effect in which the weed were greatly suppressed in comparison to the boost of grasses and legumes. These results suggest the potential of the KPCB technology to suppress the growth of weeds naturally while significantly boosting the growth of the desired crops.

(NOTE by Harvest Harmonics: this effect is NOT because KPCB has a “selective effect” as most herbicides do; on the contrary, it aims to boost all plants without bias. However, the nature of weeds is to grow more where desired crops are weak or absent. When such crops become stronger, they consume more available resources thus weeds get fewer in the overall mix.)

The graph on the left below shows the effect of KPCB on the production of grasses, legumes, and weeds. The graph on the right below shows KPCB’s strong suppression of weeds, in their percentage of the forage mix.



The graph below shows the botanical composition of the forage mix (%), with KPCB and Control.



Phenological response

The table below shows the difference in phenological responses of the forage mix between the two treatments.

Variable	Treatment		Gain
	KPCB	Control	
Height (cm)	49.67	35.04	42%
Aerial coverage (%)	77.80	57.00	36%
Basal coverage (%)	74.80	54.00	39%

Height of the forage mix (cm)

With KPCB an average height of 49.6 cm was obtained while with Control an average of 35.04 cm, signifying a gain of 42%.

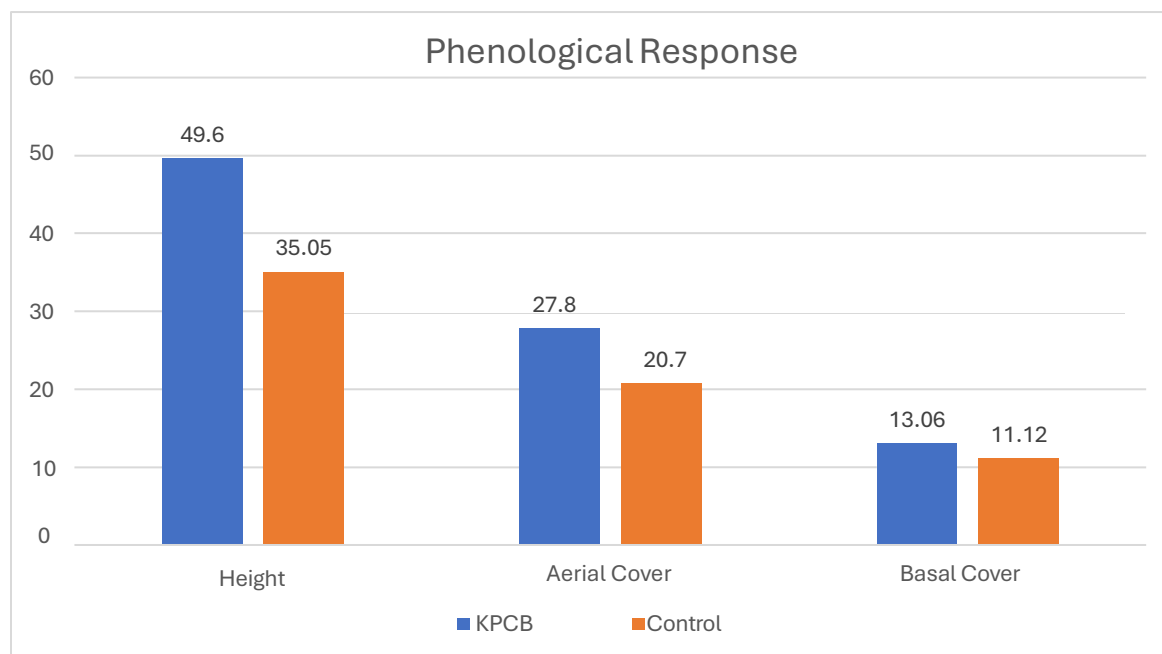
Aerial cover of the forage mix (%)

When analyzing the aerial cover variable of the forage mix, with the KPCB a percentage of 77.8% was obtained while with normal irrigation the percentage was 57%, thus achieving a gain of 36%. The researchers state that aerial cover “is an important factor in the formation of grasslands due to the air space; the larger it is, the more sunlight can penetrate the surface – the substrate contributes to the photosynthesis process of plants.”

Basal coverage of the forage mix (%)

When analyzing the basal cover variable, highly significant differences were obtained, with KPCB having 74.8% of basal cover while Control had only 54%. In the studies of Rost (2009, p. 29), he pointed out that, through adequate hydration, this variable facilitates synthesis in plant organs: roots, stems, leaves, fruits, seeds, etc., facilitating root growth and subsequent growth of stems.

The graph below indicates the phenological response when comparing the two treatments.



Forage Mix Analysis

Variable	Treatment		KPCB Advantage
	KPCB	Control	
Green forage production fv ¹ /kg/ha/cut	14,252 at 35 days	5,520 at 45 days	258%
Dry matter (kg/MS ² /ha/cut)	4,271.32	1,498.68	285%
Humidity (%)	70.03	72.85	3.9% better
Dry matter (DM ³ , %)	29.97	27.15	10.4%

¹ FV: Feed Value

² MS: Milk Solids

³ Dry matter helps to nourish the rumen bacteria to produce meat or milk.

Variable	Treatment		KPCB Advantage
	KPCB	Control	
Crude protein (CP ⁴ , %)	9.58	8.93	7.3%
Ash content (%)	1.3	1.5	8.7% lower (desired)
Crude fiber (CF ⁵ , %)	16.97	16.2	4.8%
Crude fat (%)	1.18	0.93	27%
Non-nitrogen free extract (NFE ⁶ , %)	0.95	0.41	232%
Pre-flowering days	35	45	22% faster development
Yield (ha/year)	148.65	44.77	Yield 3.3X

CONCLUSIONS

When evaluating the potential advantages of KPCB treatment vs. Control in open-sky growing of forage mix, the researchers found significant advantages in favor of KPCB technology:

- Better botanical composition of the forage mix, while boosting the plants' own ability to suppress weed growth naturally.
- Phenological responses were significantly superior to traditional irrigation with KPCB; height improved by 42%, aerial coverage by 36%, and basal coverage by 39%.
- The nutritional evaluation through a bromatological⁷ analysis found that all major factors of the forage mix that are known to assist nutrition and metabolism of ruminants were boosted significantly, e.g. 285% difference in dry matter.
- Green forage was 2.6 times bigger with KPCB treatment, and the overall yield was 3.3 times bigger.
- KPCB treatment allowed to stimulate the plants so that there was better development, greater water absorption and reduction in the days of grassland cutting (22% faster development).

⁴ Crude protein helps to have better metabolism and absorption.

⁵ Crude fiber improve digestibility and nutrient absorption.

⁶ NFE helps heat and energy of movement such as sugar, glucose, starch said component is used in the feeding of ruminants.

⁷ Bromatology is the scientific study of food.