

The relationship between grassland composition on stemborer abundance on grasses surrounding maize farms

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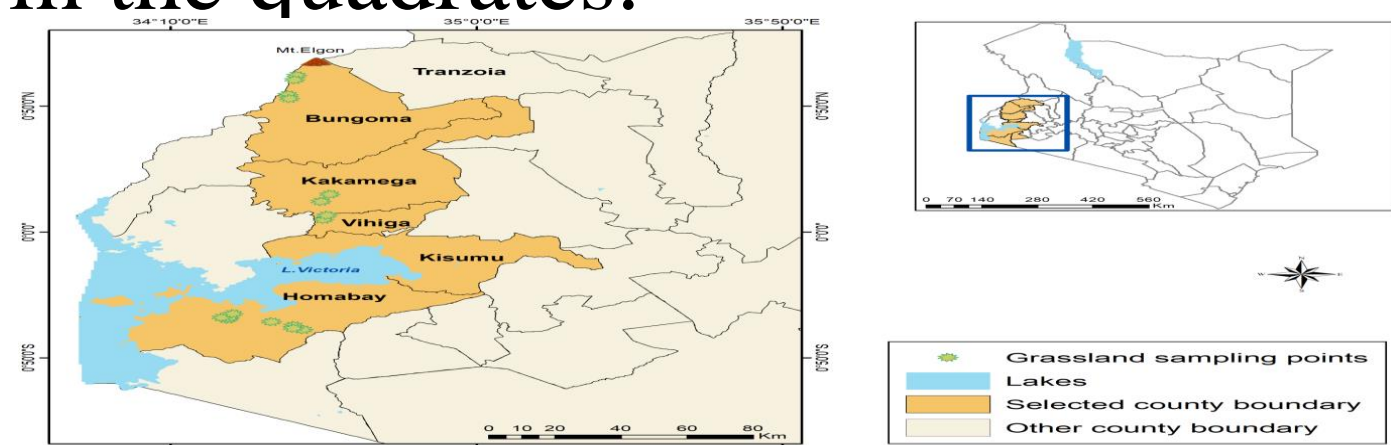
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Introduction

- Lepidopteron stem borers attack maize, they are poly-/oligo-phagous and feed on both cultivated and wild plants such as maize and grasses.
- Larvae of these stem borers cause damage by feeding on all parts of maize plant except roots and feed on almost 82% of maize plants in the field (Mwalusepo *et al.*, 2015).
- Larvae feed on immature cobs, silks and tassels (Reddy *et al.*, 2003) causing high yield losses.
- The original hosts for cereal stem borers are the wild grasses and sedges and the pest species have maintained a close association with their wild habitats (Haile and Hofsvang 2001)

Methods

- study was done in 2019 short rain season and 2020 long rain season.
- We used a systematic purposive sampling procedure, using the quadrates and transects to determine the grass species abundance, richness, and percentage cover. Disturbances were noted in the quadrates.



Impact

When farmers learn to manage the grasses surrounding their maize farms, it reduces the numbers of stem borers thus improving the maize productivity levels.

Conclusion

- Grasses act as trap plants for stem borers during the off-cropping season as seen from the study.
- There is a difference in grass composition, abundance, and biomass in the four regions.
- Grassland disturbances like grazing, pathways, etc., affect the presence of stem borers found on the grasslands surrounding the maize fields.

Objectives

- 1) Determine the relationship between grass composition, abundance, and biomass with stem borer numbers.
- 2) Determine the effect of grassland disturbance on the number of stem borers in grasslands surrounding maize farms.

RESULTS

Figure 1a: Grass distribution across the four elevations in 2019.

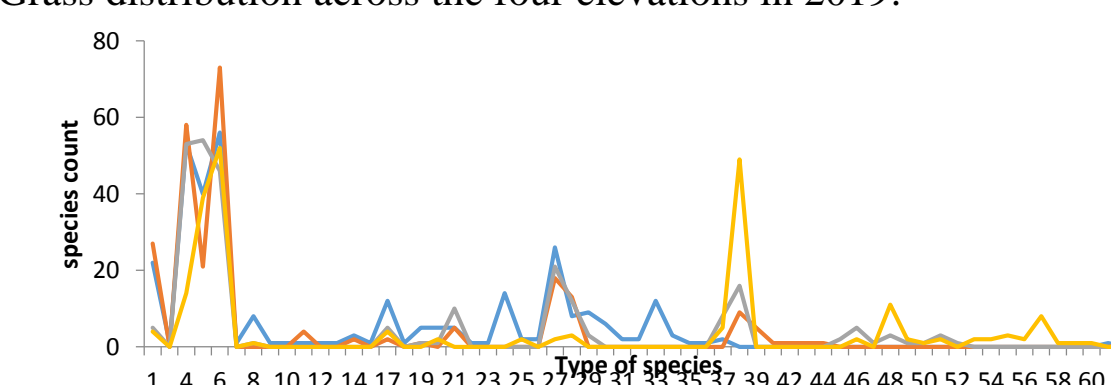


Figure 1b: Grass distribution across the four elevations in 2020.

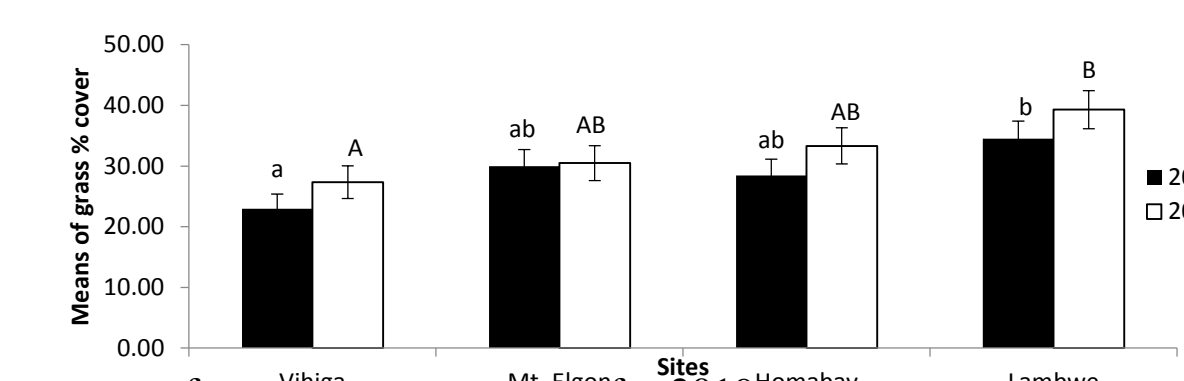
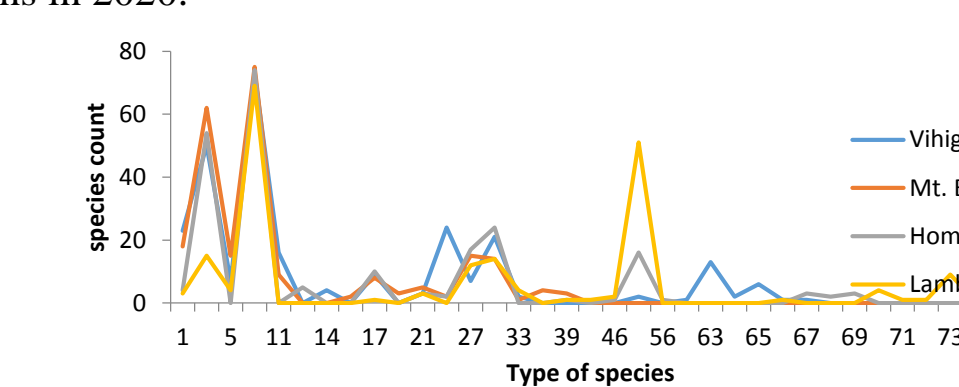


Figure 2: showing means of grass percentage cover for 2019 and 2020.

Disturbance in the quadrates	Value	Df	Asymp. Sig. (2-sided)
No disturbance	Pearson Chi-Square 16.900 ^a	12	.153
Pathway	Pearson Chi-Square 26.608 ^b	9	.002
Grazing	Pearson Chi-Square 46.511 ^c	12	.000
Ploughing	Pearson Chi-Square . ^d		
Moving water erosion	Pearson Chi-Square 9.000 ^e	2	.011
Allelochemical	Pearson Chi-Square . ^f		
Stopped on and moving water	Pearson Chi-Square . ^g		
Animal cow dung	Pearson Chi-Square 25.364 ^h	6	.000

Disturbance in the quadrates	Value	Df	Asymp. Sig. (2-sided)
No disturbance	Pearson Chi-Square 7.964 ^a	12	.786
Pathway	Pearson Chi-Square 29.530 ^b	12	.003
Grazing	Pearson Chi-Square 25.876 ^c	12	.011
S	Pearson Chi-Square . ^d		
Animal cow dung	Pearson Chi-Square 26.000 ^e	4	.000
Grass/animal cow dung	Pearson Chi-Square 13.000 ^f	2	.002
Grass/straw	Pearson Chi-Square 7.000 ^g	1	.008

Table 2: Effect of grassland disturbance on the abundance of stem borer and fall armyworm in 2020.

References

- Adugna Haile, Trond Hofsvang. (March 2001). Survey of Lepidopterous stem borer pests of sorghum, maize and pearl millet in Eritrea. *Crop protection, Volume 20* (Issue 2), pages 151-157.
- Egoh, B., J. Bengtsson. R. Lindborg, J. M. Bullock, A. P. Dixon and Rouget. (2016).

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