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

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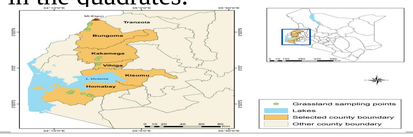
Introduction

- Lepidopteron stem borers attack maize, they are poly-/oligo-phagous and feed on both cultivated and wild plants such 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 tassel (Reddy *et al*., 2003) causing high yield losses.
- The original hosts for cereal stemborers 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 was noted in the quadrates.



Impact

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

Conclusion

- Grasses acts as trap plants for stemborers during the off-cropping season as seen from the study.
- There is difference in grass composition, abundance and biomass in the four regions.
- Grassland disturbances like grazing, pathway, ---- affect the presence of stemborers 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 effect of grasslands disturbance on the number of stemborers in grasslands surrounding maize farms.

RESULTS

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

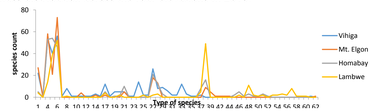
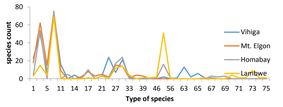


Figure 1b: Grass distribution across the four elevations in 2020.



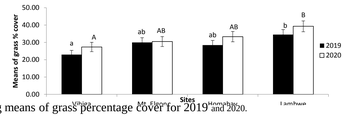


Figure 2; showing means of grass percentage cover for 2019 and 2020.

Table

Chi-Square Tests				
Disturbance in the quadrates		Value	Df	Asymp. Sig. (2-sided)
No disturbance	Pearson Chi-Square	16.906[b]	12	.153
Pathway	Pearson Chi-Square	26.608[c]	9	.002
Grazing	Pearson Chi-Square	46.511[d]	12	.000
Ploughing	Pearson Chi-Square	.[a]		
Moving water erosion	Pearson Chi-Square	9.000[c]	2	.011
Allelochemicals	Pearson Chi-Square	.[a]		
Stepped on and moving water	Pearson Chi-Square	.[a]		
Animal cowdung	Pearson Chi-Square	25.364[b]	6	.000

Chi-Square Tests				
Disturbance in the quadrates		Value	Df	Asymp. Sig. (2-sided)
No disturbance	Pearson Chi-Square	7.984[b]	12	.786
Pathway	Pearson Chi-Square	29.530[c]	12	.003
Grazing	Pearson Chi-Square	25.876[d]	12	.011
S	Pearson Chi-Square	.[a]		
Animal cow dung	Pearson Chi-Square	26.000[c]	4	.000
Grazed+animal cow dung	Pearson Chi-Square	13.000[b]	2	.002
Grazed+ stepped on	Pearson Chi-Square	7.000[c]	1	.008

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

References

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