


Introduction

- Across the food categories, fruits and vegetables are the major causes of food loss and waste globally.
- These losses are estimated at 66% based on total weight (FAO 2011; Lipinski et al. 2013).
- This is due to their very short postharvest shelf life which makes them highly perishable (Kader, 2002).
- Promotion of technologies to reduce these losses is necessary in improving food security as well as economically empowering smallholder farmers.
- Hexanal, a nanotechnology formulation of a naturally occurring compound (C₆H₁₂O) found in plants has been developed in order to slow down the ripening process in some temperate fruits.
- Hexanal can either be used as a pre– harvest spray whereby it prolongs shelf-life for 12 to 18 days or a dip on mature green fruits extending freshness for an extra 9 days.
- Hexanal provides farmers with ample time to find better markets for their produce thereby increasing their incomes.

ControlHexanal



Materials and Methods

- Study area: Meru County. Among the highest banana producing regions in Kenya. Increased commercialization of bananas in the region.
- The area is characterized with high production of bananas and lack of proper post-harvest handling techniques thereby high losses.
- In addition, Hexanal field trials have been taking place in the region from 2015 (Yumbya et al., 2018)
- Participatory Research – Learning from farmers’ experiences.
- Dissemination workshops were held to one group of farmers one month before data collection
- Figure 1 shows banana farmers in a dissemination workshop being trained on the use and benefits of Hexanal.



- Figure 1:
- Data was collected through a household survey of 130 banana farmers.

Results and Discussion

Table 1: Farmers perceptions on Hexanal.

Variable	Effectiveness		Acceptability		Environmental Safety	
	Treat-ment	Con-trol	Treat-ment	Con-trol	Treat-ment	Con-trol
Glut of fruits in the market is a serious challenge in production and marketing of bananas	0.937	0.899				
Post- harvest losses in banana production is a major marketing challenge	0.877	0.881				
Hexanal will offer solutions by increasing incomes from banana production	0.853	0.761	-0.406			
Hexanal is socially acceptable	0.754		0.824	0.678		
Education on use of Hexanal is necessary			0.505	0.654		
Government Agency should be involved in distribution of Hexanal				-0.638	0.679	
Hexanal will offer solutions to post-harvest losses in bananas				-0.630		
Hexanal cannot cause any environmental pollution			0.645	0.608		0.407
Possibility of counterfeiting Hexanal			-0.736	-0.558		
Hexanal is safe to micro-organisms					0.776	0.905
Hexanal is not a foreign material			0.429		0.572	0.878
Variance Explained (%)	28.48	23.43	20.92	22.58	13.36	18.15
Proportion of variance explained	Aware 0.6275			Not Aware 0.6416		
Kaiser -Meyer -Olkin Measure of sampling adequacy (MSA)	0.633			0.632		
Bartlett's Test of Sphericity; Approximate Chi-Square (df)	241.085(55)***			359.101(55)***		

Table 2:

Variable	Effectiveness		Acceptability		Environmental safety	
	Control	Treatment	Control	Treatment	Control	Treatment
AGE	-0.004 (0.007)	-0.009 (0.010)	-0.019 (0.009)**	-0.020 (0.013)		
GND	0.719 (0.329)**	-0.651 (0.266)**	0.327 (0.341)	0.692 (0.409)*	0.397 (0.342)	0.614 (0.353)*
EDUC	-0.377 (0.139)	0.265 (0.228)	0.037 (0.032)	0.006 (0.034)	-0.291 (0.247)	0.082 (0.239)
HHSIZE			-0.119 (0.077)	0.028 (0.093)		
MRTSTAT	-0.147 (0.302)	0.587 (0.176)***				
LANDTENURE	0.523 (0.281)*	0.772 (0.465)*	0.039 (0.267)	0.841 (0.338)**	0.039 (0.256)	-0.779 (0.277)***
EXTACC	-0.291 (0.346)	-0.205 (0.341)			0.264 (0.395)	-0.265 (0.263)
CRDTACC			0.807 (0.282)***	0.703 (0.409)*		
GRPDUR			0.015 (0.007)*	0.028 (0.012)**		
GRPMBRSH	0.398 (0.218)*	0.459 (0.372)			0.209 (0.230)	-0.145 (0.283)
DISTMKT			0.038 (0.022)*	-0.086 (0.038)**	0.012 (0.048)	-0.328 (0.086)***
DISTCOLL	-0.038 (0.038)	0.087 (0.053)				
LogINC					-0.412 (0.144)***	-0.161 (0.069)**
TOTAL_INC			-1.27 (3.93)***	-2.41 (5.50)***		
INC_BANANA	2.4 (1.03)	6.79 (7.45)				
CONSTANT	-0.354 (0.559)	-0.497 (0.600)	1.104 (0.719)	0.363 (0.935)	4.787 (1.719)***	2.482 (0.853)***
F-statistics	1.95*	2.00*	3.86***	4.34***	1.94*	4.32***
R ²	0.1687	0.2482	0.2471	0.3719	0.1642	0.4126
Adj R ²	0.0587	0.0871	0.146	0.234	0.0794	0.317

Conclusions & policy implications

- There is need to invest in extension among the farmers in order to enhance the positive perceptions on Hexanal leading to increased adoption.
- Access to credit facilities as well as road networks should be improved in the rural areas to enable farmers invest in innovations thereby reducing their post-harvest losses.

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