

**EX-ANTE ASSESSMENT OF WILLINGNESS TO PAY FOR LARVAE SPY
AS CEREALS' PEST EARLY WARNING ACOUSTIC TECHNOLOGY IN
KENYA**

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DECLARATION

I, Dr. Hermina Naktaria, declare that the information provided in this form is true and correct to the best of my knowledge and belief.

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Supervisor Approval:

We confirm that the work reported in this thesis was carried out by the candidate under our supervision and has been submitted with our approval as university supervisors.

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ABSTRACT

The current existing Post-Harvest Losses (PHLs) mitigation measures being used by grain store managers and traders are basically physical hence inefficient for timely insects' detection and monitoring. The introduction of alternative but effective equipment for monitoring and early detection of insect pest populations' grain storage is essential. Development of a technology without its adoption is meaningless hence the need to establish ex-ante willingness to pay for the larvae spy device. The main objective of this study was to assess the ex-ante Willingness to Pay (WTP) for the Larvae Spy device by grains store managers and traders in Kenya. The specific objectives were; (i) to estimate facility managers' and traders' WTP for the larvae spy device in Kenya, (ii) to compare the WTP for the Larvae Spy by cereals store managers and traders in Machakos, Nakuru and Nairobi counties in Kenya and (iii) to determine the factors influencing the managers' and traders' WTP for the larvae spy device in Kenya. Interview-based primary quantitative and qualitative data were collected using a semi-structured questionnaire from 139 cereals store managers and traders in 3 counties in Kenya (Machakos, Nakuru and Nairobi) as a representative of counties with high number of cereals stores. Double-Bounded Dichotomous Choice Model was used to estimate the managers' and traders' WTP. To compare the WTP for managers and traders in the three sampled counties, a chi-square test was used. Logistic regression was used to assess factors influencing WTP. The Cox and Snell R square results of the binary logistic regression on the store managers and cereal traders indicate that there was 31% probability of the larvae spy acoustic technology being adopted by the cereals store managers and traders in Kenya at a price of KSh 80,000. The calculated chi-square was found to be significant; hence, not rejecting the null hypothesis that there is no statistically significant difference in WTP between managers and traders in the three sampled counties. The WTP is determined by education level, expected availability and affordability of the device, expected risk reduction potential by the device, labour requirement by the device, trend of PHLs caused by pests and capacity of the facility. The major impediment to the technology adoption was attributed to the high Larvae Spy acoustic technology prototype price. The results suggest that the design and development of the final larvae spy acoustic technology should consider the price for market penetration. If the manufacturer decides to introduce the technology into the Kenya market at the prototype price used for this research, then they should target large cereals stores, make the technology available and affordable and target stores run by managers and traders who have acquired some significant level of education. Finally, the study recommends that policy intervention aimed at addressing food insecurity should support grain pest detection acoustic technologies adoption to grain handlers for prompt and timely grain pests control measures.