

## **IMPORTANCE OF EPIDEMIO-SURVEILLANCE: THE EXAMPLE OF BOTSWANA**

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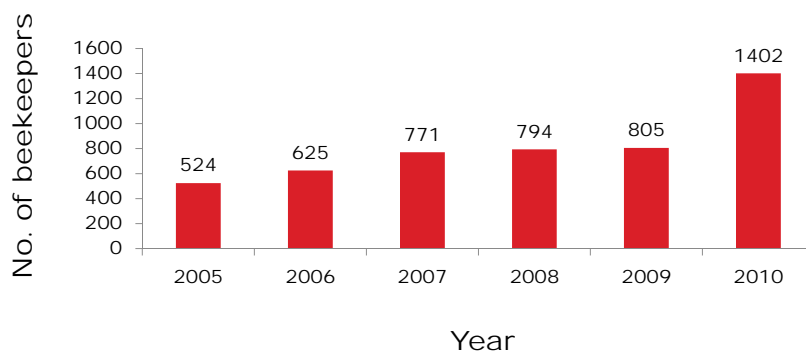
### **OUTLINE**

- ▶ Introduction
- ▶ Objectives
- ▶ Results and Discussion
- ▶ Recommendations

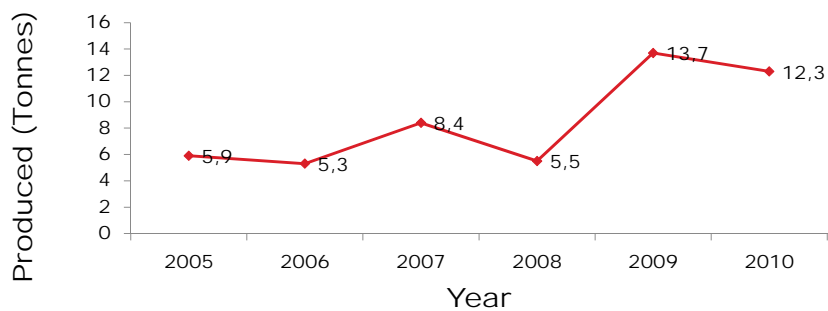
## INTRODUCTION

- Beekeeping prioritised as critical for diversification of the economy of Botswana
- Is promoted among small scale resource poor famers
- Government also promotes development of commercial scale beekeeping
- The natural vegetation offers suitable forage species for beekeeping
- Botswana has potential for integration of beekeeping into crop production systems

**FIGURE 1: TOTAL NUMBER OF BEEKEEPERS:  
2005 - 2010**



**FIGURE 2: TOTAL AMOUNT OF HONEY PRODUCED 2005 - 2010**



**TABLE 1: ABUNDANCE OF ABSCONDING HONEY BEE COLONIES IN BOTSWANA (1997 – 2003)(SOURCE: MONTSHIOA & NGAKANE. 2003)**

Year	Total No. of colonies	No. of Colonies Absconded	% Absconded Colonies
1997/98	603	100	17
1998/99	372	216	58
1999/00	459	328	71
2000/01	785	184	23
2001/02	973	499	30
2002/03	729	499	68

### **OBJECTIVES OF THE SURVEY**

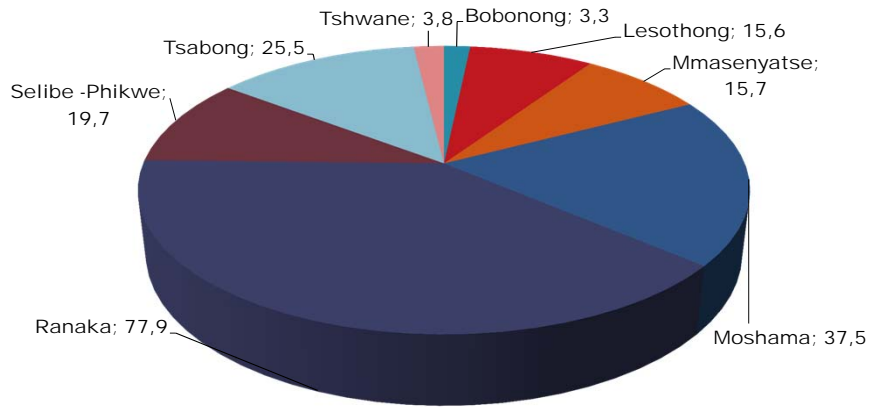
- ▶ To evaluate abundance and distribution of varroa mites in honey bee colonies
- ▶ To determine incidence and intensity of brood disease infection brood combs from different parts of Botswana

### **METHODOLOGY (I): SURVEY METHODS**

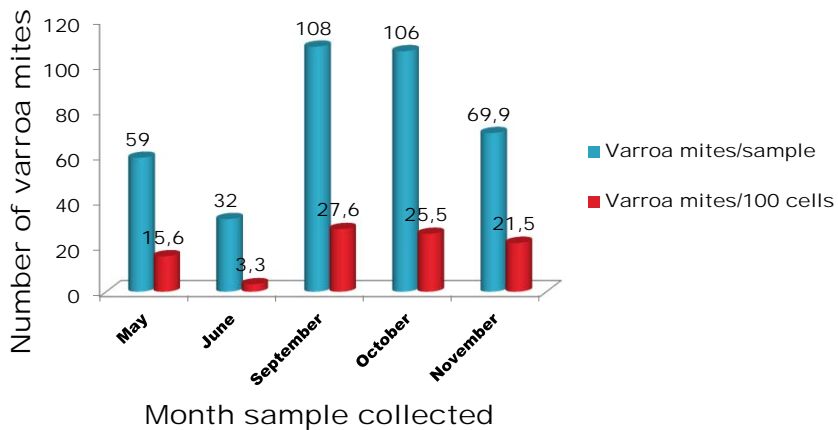
- ▶ Sampling Period: May – November 2009
- ▶ Sampling sites: 6 of 8 Agric. Regions
- ▶ Total Sample Size: 47
- ▶ Brood comb piece: 15 cm x 12 cm
- ▶ Data extraction: At 20 x magnification



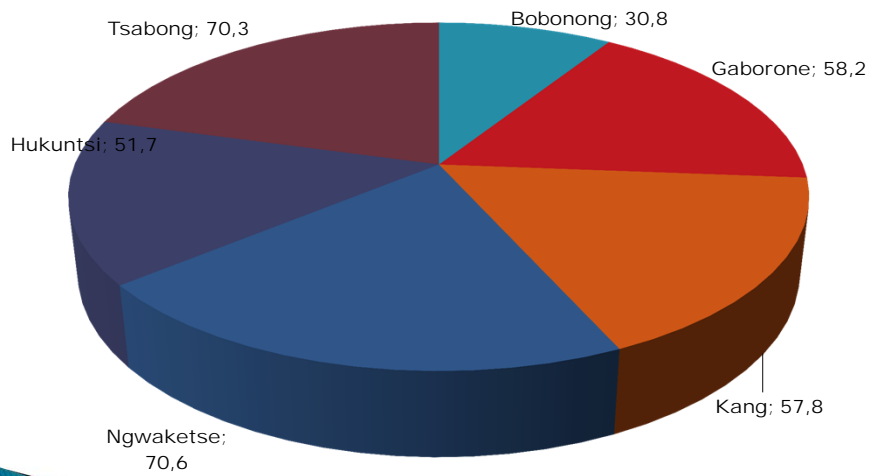
**FIGURE 4: NUMBER OF VARROA MITES/100 COMB CELLS IN SAMPLES FROM DIFFERENT LOCATIONS**



**FIGURE 5: AVERAGE NUMBER OF VARROA MITES IN COMB CELLS SAMPLED ON DIFFERENT DATES**



**FIGURE 6: AVERAGE % DISEASED LARVAE/COMB IN SAMPLES COLLECTED FROM DIFFERENT LOCATIONS**



**PIECE OF BROOD COMB WITH DISEASED LARVAE**



**PIECE OF BROOD COMB WITH DISEASED LARVAE**

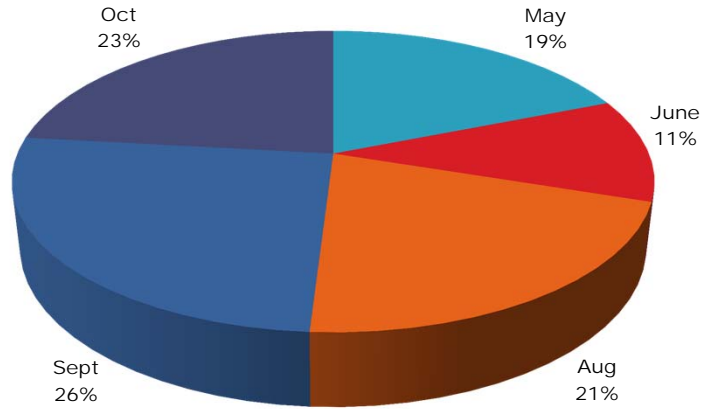


**CLOSE-UP ON INFECTED LARVAE IN BROOD CELLS**

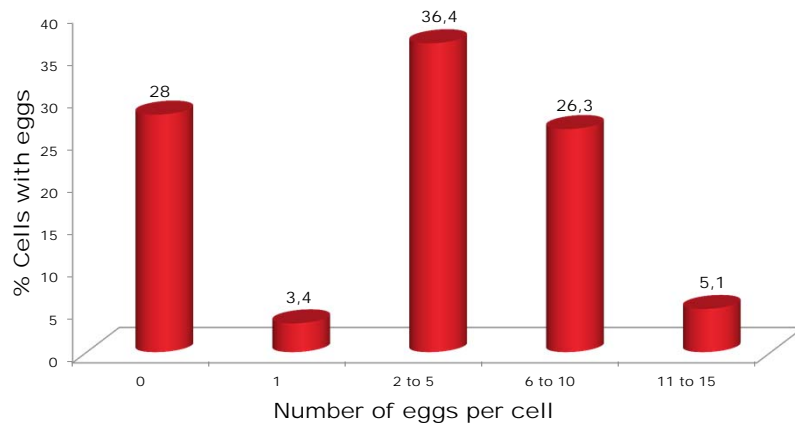




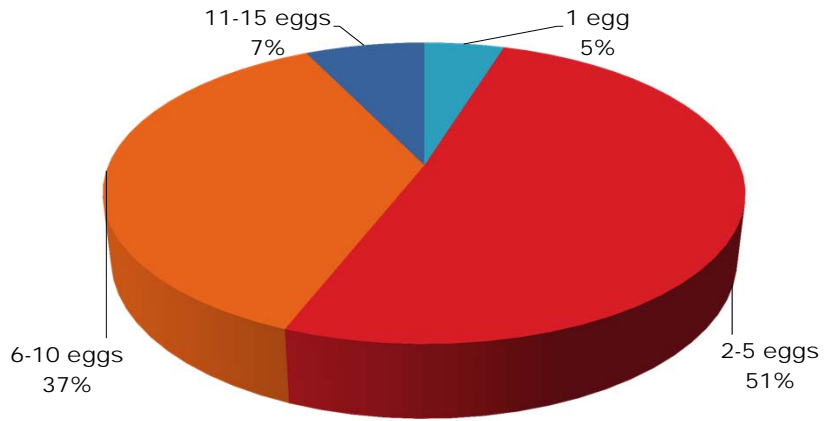
**FIGURE 7: % DISEASED LARVAE IN HONEY BEE COMBS SAMPLED ON DIFFERENT DATES IN 2009**



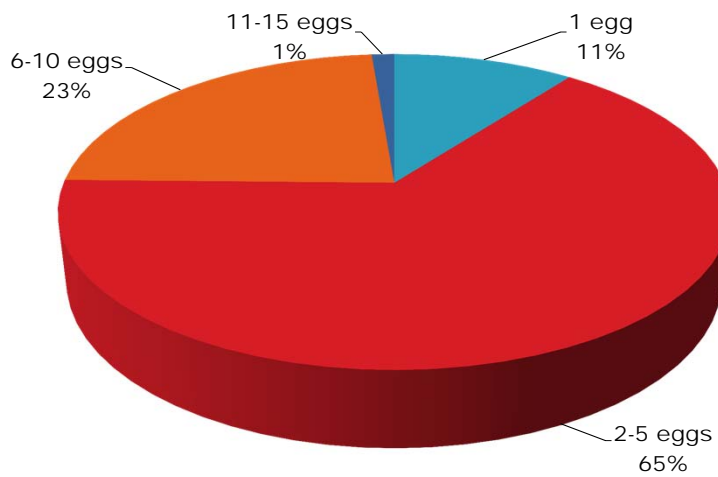
**FIGURE 8: AVERAGE % COMB CELLS WITH DIFFERENT NUMBERS OF EGGS IN AN IRREVOCABLY QUEENLESS COLONY**



**FIGURE 9: % COMB CELLS WITH DIFFERENT NUMBERS OF EGGS FROM IRREVOCABLY QUEENLESS COLONY EXCLUDING THOSE WITHOUT EGGS (SIDE 1 OF COMB)**



**FIGURE 10: % COMB CELLS WITH DIFFERENT NUMBERS OF EGGS FROM IRREVOCABLY QUEENLESS COLONY EXCLUDING THOSE WITHOUT EGGS (SIDE 2 OF COMB)**



## **RECOMMENDATIONS ON FUTURE ACTIVITIES**

- ▶ Regular monitoring of pests and diseases
- ▶ Monitoring incidence of absconding colonies
- ▶ Research to identify factors causing absconding of honey bee colonies
- ▶ Research to determine effects of bee diseases on bee colony sizes & productivity
- ▶ Research on suitable methods of controlling major pests & diseases of honey bees in Botswana
- ▶ Comprehensive survey & identification of pests and diseases occurring in Botswana

***THANK YOU FOR LISTENING***

