

# Determining the Activation and Taxis of Bed Bugs in Response to CO<sub>2</sub>

---

*Progress Report to the Pest Management Foundation*

Corraine A. McNeill  
Seth A. McNeill  
Roberto M. Pereira  
Philip G. Koehler

10/11/12

## Table of Contents

Table of Contents .....	2
Current Status.....	3
Timeline .....	5

## Current Status

We have the testing setup finished and have preliminary experiments finished. Figures 1 and 2 show what the setup looks like. We have 6 cameras on a frame directly over 6 petri dishes of bed bugs. The outer dishes act as a backup containment vessel since the dishes of bed bugs have to remain uncovered.



Figure 1. Setup showing the 6 cameras and supporting frame.

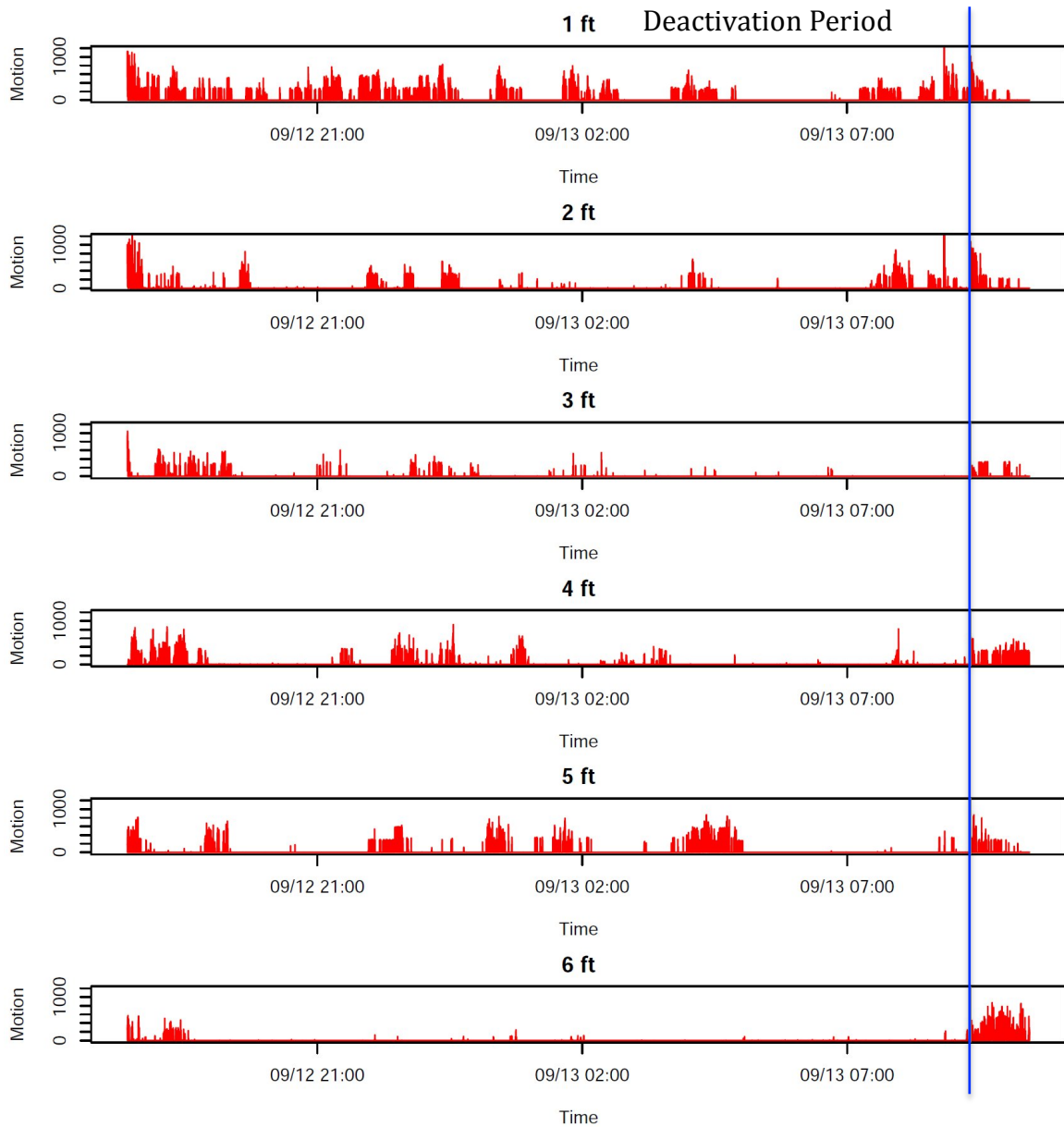


Figure 2. Closeup showing cameras and dishes containing bed bugs.

A video from one of the cameras is at: <http://anitracks.com/c1/bedbugs.avi>.

The analysis program for quantification of bed bug movement in the videos has been written. This analysis program currently analyzes the video by counting the number of pixels between successive frames that have changed. Based on this we are able to determine the amount of activity in each dish throughout the experiment.

An example set of results is shown in Figure 3. The blue vertical line is where a breath was breathed into the stimulus tube. The air handling has been blocked for the room and the lights were kept off during the whole experiment. The strong stimulus on the first two dishes just before the breath stimulus was where someone accidentally opened the door to the room.



**Figure 3. Analysis results of the six video streams showing bed bug activity. The blue vertical line towards the right of the figure represents where a breath stimulus was input to the system.**

## Timeline

- 2012 May 09: Preliminary tests on feasibility of measuring bed bug activity with a video
- 2012 May 17: Notification of funding
- 2012 Jun 01: Project start date
- 2012 Jun 06: First camera purchase to verify it as the model to buy
- 2012 Jul 06: All 6 cameras and networks switch arrived to try
- 2012 Jul 19: All 6 cameras recording
- 2012 Aug 14: Project funding (money released by UF)

2012 Aug 16: Computer for running the cameras and analyzing video arrives (prior tests done at Seth's office)

2012 Aug 28: Full assembly of cameras and bed bugs ready for testing

2012 Aug 31: Analysis software first revision running

Ongoing:

- Improving the software in both analysis and ease of use
- Running control tests to make sure that the setup works as desired