



Insects Limited, Inc.



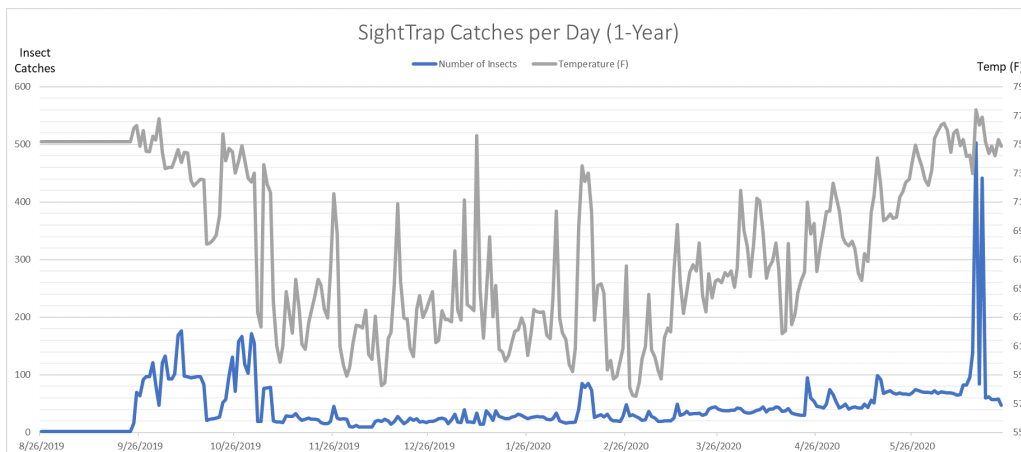
Tom Mueller

A SightTrap Update – What We Have Learned

It has not been the easiest endeavor of creating the [SightTrap](#). Until now, we could only hypothetically speak about the insights and information a device like this will provide allowing us and our customers to make timely decisions on stored product insect infestations in food facilities. In this short article, you will get a small glimpse into what we have learned.

Creating this device has taken time, brainpower, patience, and more time. We spent a significant amount of time conceptualizing what a remote pheromone monitor would look like for the structural pest control industry. After that, we spent a significant amount of time evaluating the right partners to help us create the device. After that, we spent a significant amount of time developing the device to simply bring it to market. Since the launch of the [SightTrap](#), we have worked closely with all parties involved to refine the device and software, [ForesightIPM](#) so it can become an optimal device to equip our partners with information that will free their time to provide a service that is centered around facility inspections and solving solutions rather than simply counting insects in traps to identify the simple and obvious fact that there is a problem. Sanitation managers at a food facility know they have a problem; they can walk around and count the insects in a trap. You are hired to tell them why and help eliminate it. Our customers get that and using the [SightTrap](#) they can start solving the problem efficiently, saving themselves and their customer time, headaches, and more importantly, customer complaints and returns.

With the information the [SightTrap](#) has provided us, I can confidently tell you that when temperatures reported from the SightTrap are above 65 degrees Fahrenheit (18.3C) and the temperature increases 1F from the day before, we see a significant (20+ insects in all SightTraps combine) increase in daily catch 25% of the time. Similarly, when the temperature is above 65F and increases by 1F from the day before, 83% of the time, we catch at least one insect. Our ability to provide information like this to customers will allow them to move toward preventing problems rather than reacting to them. This will allow for better FSMA compliance and help us move toward that ever elusive 0 zero tolerance goal.



Fumigants & Pheromones

Insects Limited, Inc.

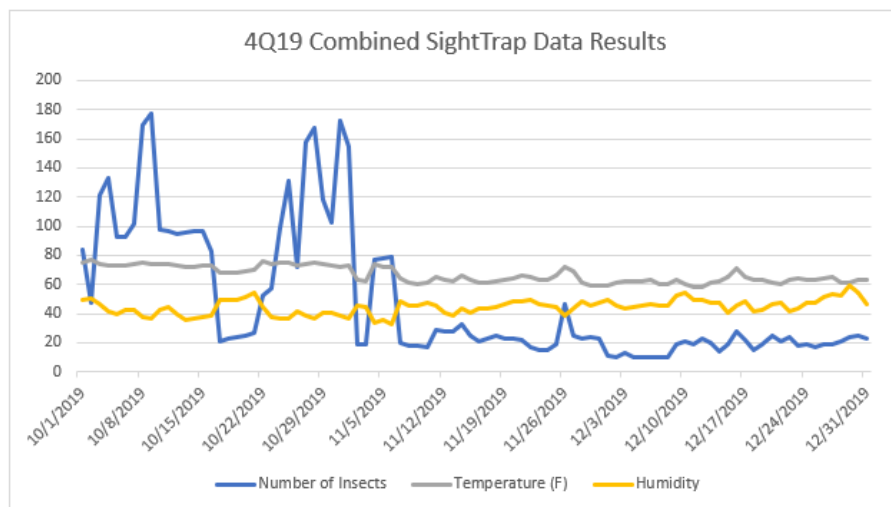


Tom Mueller

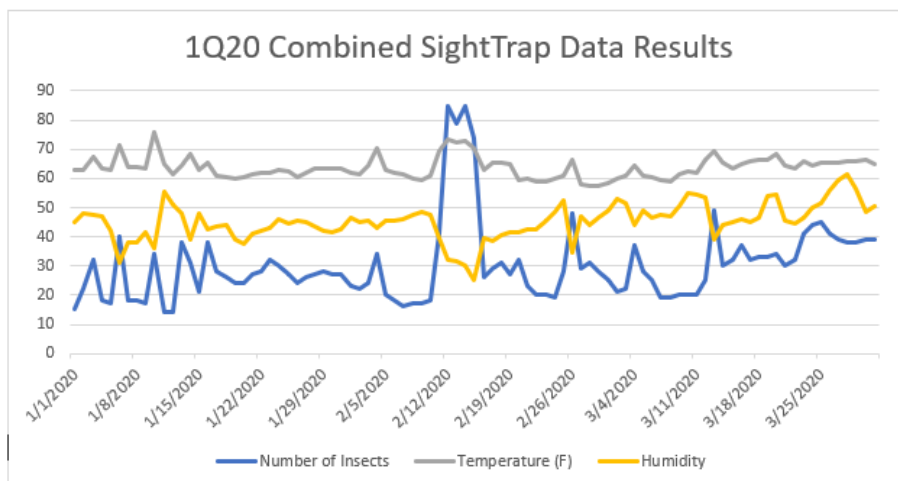
A SightTrap Update – What We Have Learned

The above chart reflects the total number of catches in all available SightTraps compared to the average temperature reported by the SightTraps. We see that once temperatures within the facilities reach higher than 76F, the activity increases dramatically.

Note: The above chart does not include July which was a month we saw a great increase in both temperature and the number of insects caught.



Above is a zoomed in reflection of the final months of 2019. Notice the small spikes in temperature and catches as we moved into the cooler months.



Fumigants & Pheromones

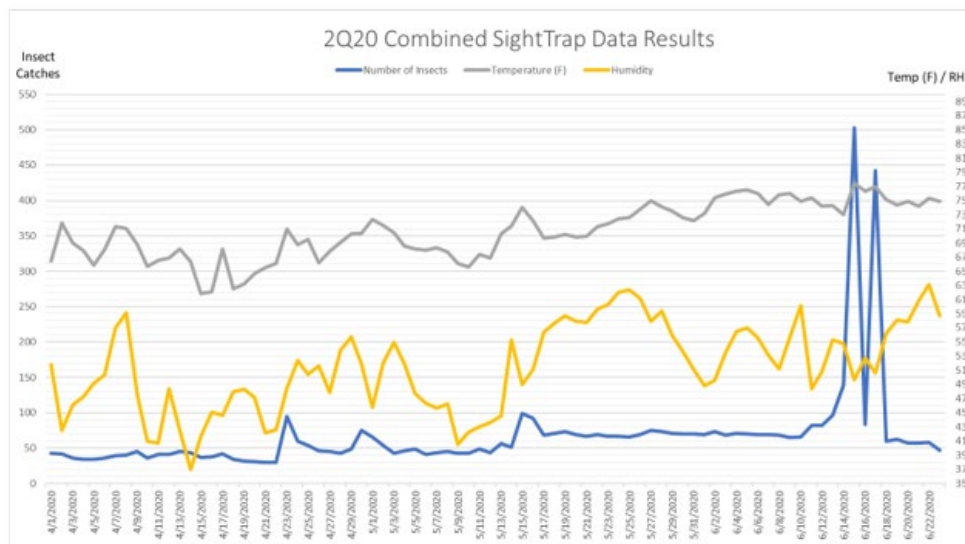
Insects Limited, Inc.



Tom Mueller

A SightTrap Update – What We Have Learned

This chart takes us through the winter months. We see a real inverse correlation between humidity and the increased number in insects caught. As the humidity dropped the insects seemed to become more active.



We were able to see the results of a cool spring with relatively low daily catches. It was not until temperatures reached 75°F before the SightTraps started having a great increase in catches.



The SightTrap story.

Pheromone monitoring just got easier with SightTrap, which puts cameras in your traps and gives you access to essential information and data on your computer and smart phone. Get accurate counts and see trends develop without inspections ... which means better results and happier customers in less time and with fewer steps.



Get in Touch

Fumigants & Pheromones

Insects Limited, Inc.



Pat Kelley, BCE

Insects as Vectors of Disease



In this time of the pandemic, there is much concern about our environment and how it affects our health. The truth of the matter is that although insects do not transmit COVID-19, they always have played a major role as vectors of disease in humans by carrying and transmitting viruses, parasites, and bacteria. Mosquitos, flies, fleas, bugs, and ticks can carry and transmit diseases that can cripple, paralyze, cause chronic pain, and kill people. Globally, mosquitos carry a multitude of diseases such as Dengue fever, Yellow fever, Malaria, Zika, Encephalitis, West Nile fever, and more. Flies can deliver Onchocerciasis (River blindness), African trypanosomiasis (Sleeping sickness), Leishmaniasis (Ulcerous skin sores, difficulty breathing) and fever.

Tickborne diseases alone in the USA cause much pain and suffering from such diseases as Lyme disease, Babesiosis, Rocky Mountain spotted fever, and more. The National Institute of Health stated in 2018 that tickborne infections in the United States have gone up significantly in the past 10 years. If untreated over long periods, the symptoms can get much worse and will lead to serious health problems. Identification and prevention is essential in tickborne diseases. The CDC has put together a valuable Identification sheet that can be found in this link:

<https://www.cdc.gov/ticks/tickbornediseases/TickborneDiseases-P.pdf>

Prevention in the form of avoiding areas where ticks are found and wearing protective clothing and tick repellents if you do have to go into those areas can reduce ticks from coming in contact with you and biting you. If someone finds a tick on themselves, they should take the time to make an identification and see which, if any diseases that species of tick are capable of transmitting. Carefully pull the tick from your skin using a fine-tipped tweezers with steady, even pressure. Clean up the area of the bite with rubbing alcohol or soap and water. Place the tick in a sealed plastic bag and freeze it until it dies to keep it as a reference if needed. See a doctor immediately if you have any concerns or if you start to experience any symptoms (Rash, muscle pain, fever, joint swelling, fatigue) within 30 days of the tick bite.

Vector Borne Diseases

<u>Vector</u>	<u>Disease caused</u>	<u>Type of pathogen</u>
Mosquito <i>Aedes</i>	Chikungunya	Virus
	Dengue	Virus
	Lymphatic filariasis	Parasite
	Rift Valley fever	Virus
	Yellow Fever	Virus
	Zika	Virus
<i>Anopheles</i>	Lymphatic filariasis	Parasite
	Malaria	Parasite
<i>Culex</i>	Japanese encephalitis	Virus
	Lymphatic filariasis	Parasite

Fumigants & Pheromones

Insects Limited, Inc.



Pat Kelley, BCE

Insects as Vectors of Disease

	West Nile fever	Virus
Aquatic snails	Schistosomiasis (bilharziasis)	Parasite
Blackflies	Onchocerciasis (river blindness)	Parasite
Fleas	Plague (transmitted from rats to humans) Tungiasis	Bacteria Ecto parasite
Lice	Typhus Louse-borne relapsing fever	Bacteria Bacteria
Sandflies	Leishmaniasis Sandfly fever (phlebotomus fever)	Bacteria Virus
Ticks	Crimean-Congo haemorrhagic fever Lyme disease Relapsing fever (borreliosis) Rickettsial diseases (eg: spotted fever and Q fever) Tick-borne encephalitis Tularaemia	Virus Bacteria Bacteria Bacteria Virus Bacteria
Triatome bugs	Chagas disease (American trypanosomiasis)	Parasite

Tsetse flies	Sleeping sickness (African trypanosomiasis)	Parasite
--------------	---	----------

Taken from World Health Organization website:
<https://www.who.int/news-room/fact-sheets/detail/vector-borne-diseases>

Tickborne Disease in the United States



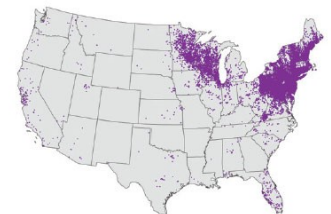
ANAPLASMOSIS



BABESIOSIS



EHRlichiosis



LYME DISEASE



SPOTTED FEVER RICKETTSIOSIS (INCLUDING ROCKY MOUNTAIN SPOTTED FEVER)



TULAREMIA

Fumigants & Pheromones

Insects Limited, Inc.



Pat Kelley, BCE

Insects as Vectors of Disease

Map of Tickborne diseases reported in the United States in 2016 the United States in 2016

<https://www.cdc.gov/ticks/tickbornediseases/overview.html>



A Blacklegged (Deer) Tick female bites a human host

What about the question of whether or not [Stored Product Insects](#) as vectors of disease? The good news is that insects that typically feed on our dried food supplies of grains, nuts, cereals, pastas, or woolens and natural fibers are not majors vectors of disease, but the hairs and body indentations on some of them can pick up and carry pathogens and thus the insects are mechanical vectors of these pathogens. Hairy fungus beetles can carry the bacteria in *Salmonella enterica* and can also feed on aflatoxin with no negative effects. Fungal toxins have been found on lesser mealworms and confused flour beetles.

Insects in general represent a great benefit to mankind through aesthetic beauty, pollination of our plants and crops, products that we use, and food that we eat such as beeswax and honey. It is important to note though that we must be mindful of some of the physical harm that

they can also cause and protect ourselves in situations where we place ourselves in danger.

Learn more about Stored Product Insects



Pat Kelley, BCE

Look a Little Bit Closer



Insects Limited entomologist Ethan Estabrook examines small insects on a sticky monitor.

The use of sticky blunder traps to monitor for pests has become an integral part of an IPM program. Early detection of destructive insect pests is one of the best ways to prevent damage to those things that we want to protect. Many pest management specialists who regularly check traps are usually quite good at identifying common stored product insect pests. What is often overlooked though, is the small, dark speckled stuff around the edge of the sticky traps. Often mistaken for dust and debris, this peppery-looking material is often very small insects that can provide valuable information for pest management.

Here are some of the common culprits that often are too small (~1 mm) to identify with the naked eye;



1. **Psocids, common name – booklice: Size 1 to 5 mm.** Some Psocids can have wings and others will not. In large numbers, they can do damage to books, papers, and even furs. Their soft bodies need lots of moisture. Drawing down the humidity in the storage area only by a few percentiles can often eliminate this pest



2. **Rove Beetles Family Staphylinidae: Size: <1 mm to 35 mm.** Although there are over 45,000 species of rove beetles, even the smallest species are attracted to light and will feed on detritus.



Pat Kelley, BCE

Look a Little Bit Closer

Look at your outdoor lighting and entry points into the building as well as an increase in sanitation to eliminate these pests.

host. Colonies contain hundreds to a few thousand ants.

In the below [video](#), tiny ants called "Thief Ants" crawl onto an insect monitoring glue board and feed on a wolf spider caught in the trap.



Ant products distributed by
Insects Limited

3. **Thief Ants, *Solenopsis molesta*: Size: 1.5 – 2.2 mm.** These ants are so small, they live undetected within the colonies of other ants, killing and eating the immature forms of the





Pat Kelley, BCE

Look a Little Bit Closer

Next time that you check your traps bring along a hand lens or get access to a microscope to identify what is in your trap. These little guys may be your biggest pest!



4. **Springtails order Collembola: Size: 0.4 – 10 mm.** These small insects feed on microscopic molds and are thus associated with damp environments. Look for water leaks and increase ventilation or decrease RH in problem areas.



5. **Actual Dust & Debris:** (Sometimes dirt is dirt!)