

How Pest Thermography is a Good Candidate in Choosing a New Income Stream

Bart Bruni
Level II Certified Infrared Thermographer
Bestec Exterminators, Inc.
Hallandale Beach, FL 33009
Ph: 954-458-5357

www.bestechomeinspections.com

Abstract

In our ever-changing economy many companies are looking for new income streams. In this paper we will examine pest thermography as a possible candidate. We will discuss two of the hottest money making pests to date as they relate to IR pest inspections. We will look at what it takes to discover, identify, and report valuable information that will save an end user's property from total destruction. We will also offer suggestions on how to market this service.

Introduction

US pest control services. Industry includes about 12,000 establishments (single-location companies and branches of multi-location companies) with combined annual revenue of about \$9 billion.

Major companies include: Terminix (owned by ServiceMaster) and Orkin (owned by Rollins). Other major players are the pest-control operations of sanitation companies such as Ecolab or Swisher International. The industry is fragmented - the 50 largest firms generate less than 50 percent of industry revenue.

Competitive landscape. Demand is driven by home sales and the occupancy of commercial and industrial properties. The profitability of individual companies depends on providing good service. Large companies benefit from brand recognition and economies of scale in advertising, franchising or back office operations. Small companies can compete successfully because large companies have no advantage in providing good service.

Labor-intensive. Average annual revenue per employee is about \$90,000.

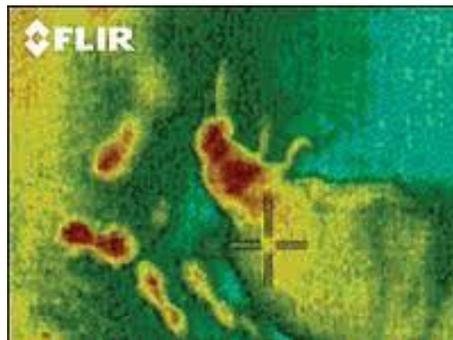
Discussion

The two best pest money makers for thermographers in southern parts of the US are Asian subterranean termites and Africanized honey bees. They threaten two basic things most everyone fears, destruction of home and property or an insect attack that can easily take your life or the life of your loved one. Asian termites and Africanized bees pose that threat in a big way. Infrared, pre and post inspections, has proven to be cost effective, accurate, and valuable in finding nests which are the source of these insect infestations.

We will start with Asian Subterranean Termites. IR Pest Thermography is endorsed by the U.S. Department of Agriculture as the most effective method used in detecting subterranean termites after the traditional inspection has been performed.

Infrared imaging is defined as the study and documentation of thermal patterns across a surface or an object. Infrared cameras detect invisible light spectrum (infrared) ranging from 0.75 to 1000 microns and temperature differences of 0.05 of a degree. When irregular thermal patterns are detected during an infrared scan a deeper investigation into those areas will be necessary. When inspecting for Asian subterranean termites, a cooler than ambient thermal pattern is what to look for, just as you would during a moisture inspection. In the case of a killer bee infestation, obviously, the thermal pattern will be above ambient temperature due to the energy that the bees create in the hive.

A Certified Pest Thermographer can quickly find and identify Asian termite nests and killer bee hives. This a vital part of the hive or nest elimination process. Hit and miss procedures are risky. IR reveals the total size of the nest or hive that needs to be removed or eliminated. This is important due to the fact that both termites and bees are ruled by Queens. The pest control operator working with you will need a quick and stealth kill strategy. If not, the Queen will move and the infestation will follow her, relocate and survive. Post treatment inspections become critical when treating harmful insects such as these.



IR image of termite: queen goinfrared.com

A false sense of security, as it relates to the success of the treatment in the case of these two pests, could lead to huge economic loss, severe injury or loss of life. Most homes or buildings that get eaten down or severely damaged are covered under a termite agreement with a licensed termite company. Yes, it is true the property owner paid for termite service. Why do they fail? The lack of inspection protocol that will produce the discovery of the target pest before sizable damage occurs. Most termite companies rely on chemicals to do the job and have become complacent about post inspections. In fact, “it takes more than chemicals to get Asian termites under control. The companies that take this liability on need IR scans on certain accounts in their customer base before it goes to the authorities and attorneys.”



Coptotermes formosanus-Shiraki, a.k.a. the Formosan subterranean termite, China

Coptotermes Havillandi./ gestroi a.k.a. West Indies termite / a.k.a Asian termites

The current chomping ground for Asian / Formosan subterranean termite varieties is the Southern tip of the US from Florida, moving to the west, to California and Hawaii. Subterranean termites typically get water from the ground. This variety of subterranean termite will build an above ground nest called a “carton.” What is necessary for this to occur is an above ground moisture source, such as a condensation A/C line in an attic or a wall. One drop from an eye dropper will sustain one million termites for a day. Once another moisture source is established and the carton is built they have no further need to go to the ground for water so they don’t.

Unfortunately, that is where the chemicals that can control or correct the infestation are located. The termites mentioned above are the most destructive termites on the planet. Subterranean termites create more damage per year than fire, tornados and hurricanes combined. Asian termite colonies can contain as many as ten million termites, opposed to the native termites, which contain about one million members. Colonies can consume three to eleven pounds of wood per day. This occurs because this termite, unlike other varieties of subterranean termite, twenty-five percent of the time, will infest from the air



Average size carton nest for south Florida

during swarming season with no contact with the soil, creating new nests from an air invasion and not from the ground, as all other subterranean termite species do. Treatments that are designed to correct Formosan termite infestations are based on soil treatment. Truth be known, 2 out of 10 are aerial infestations.

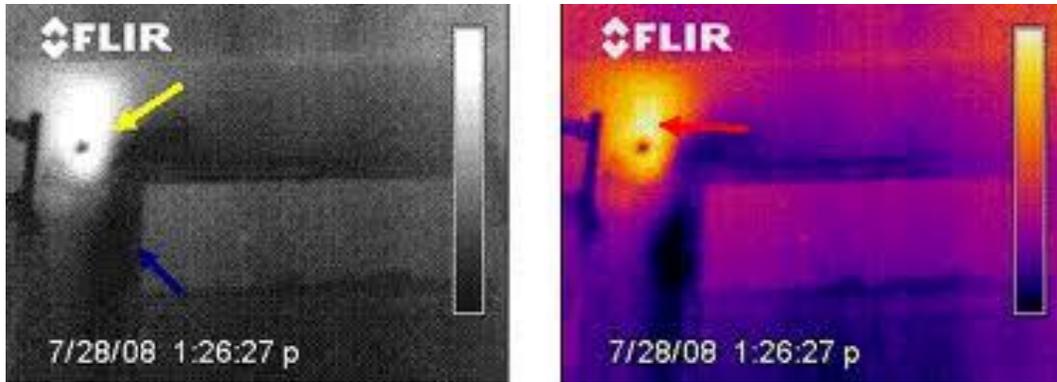
The French Quarter of New Orleans is very familiar with Formosan termites. Many of the locals have dubbed the fight against Formosan termites “The second Battle”, the first battle being against the British, as Andrew Jackson’s troops defended the city back in 1815. In 1998 the US Congress appropriated multi-millions of dollars into a fund dubbed as “Operation Full Stop“. This was an ambitious initiative.

Under the management of the LSU AgCenter, the program employed a 3-prong approach to termite control: monitor, treat, and research. Program staff currently monitor 600 in-ground stations and 100 sticky cards to track termite infestations. The problem was that most of the buildings are wooden and on zero lot lines. Aerial carton nests plagued the standard treatment procedure. The termites found alternative moisture sources above ground and built cartons, in these cases soil treatment was no longer effective. Therefore, cartons were frequently missed during visual inspections, which caused the treatments to repeatedly fail.

The main goal of the pest operator is to find, treat and quantify the kill of all carton nests in a structure. Therefore, the termite industry fell by way of baiting termites, in hopes that eventually the affected termites themselves would transfer some baiting material into the cartons over a long period of time. Time, however, is something you do not have the luxury of when treating these types of termites. The property owner is suffering substantial damage each day the infestation is not corrected. This is where IR pest thermography becomes a valuable asset. Thermography detects subterranean termite carton nests. The distinctive thermal signature that is captured in a Thermogram makes locating these insects accurate and effective. IR provides the end user with the nest location, size, source and exactly where the Queen’s chamber is located. IR also provides a non-destructive means to document the thermal pattern associated with a termite infestation progress over a short period of time. Just six to eight weeks for patterns to be consistent with walls in the same structure, with no live termite infestation present.

This is the cold hard truth, the pest professional that cannot locate the cartons readily, accurately, and document their results, is providing very little to the consumer except a false sense of security.

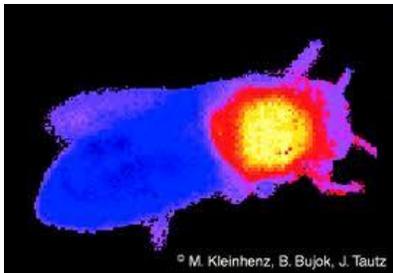
Pre-treatment inspection and post inspection of carton extermination, in my opinion, is imperative. Under these conditions, at least four IR pest inspections per year is the minimum, and every month being the maximum. For the **inspection service companies** the renewable income aspect of IR pest inspections four times per year, year after year, should be impressive and welcome revenue.



IR images of active carton nest

Carton nests vary in size and moisture requirements, however, the signature of an active Formosan termite carton hidden behind plaster or drywall is unique. This is how the thermogram above would read; a cool signature would appear around the carton. Beyond that cool area would be a hot signature, which is the carton. This is where termites are moving around in the millions generating heat. The next area is a warm signature, which is the Queen's chamber (as seen in IR image above).

Killer Bees? Yes, they are real. Also known as "Africanized honeybees" (AHB) or "Africanized bees", they are a result of pure African bees breeding habits. African Queen Bees were released accidentally in San Paulo, Brazil. They appeared in South America in 1956 and bred with the local honey bee of Brazil. Since then they have multiplied vigorously, extending their range throughout South, Central, and North America.



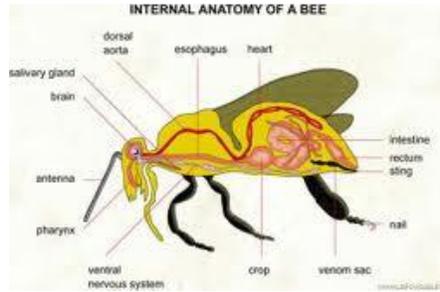
Africanized Bees dispersed throughout central and south Florida, and the southern parts of the US from 1990 to 2009. The State of Florida has hundreds of bait traps to start the process of genetic testing. This test

may lead to better control. Bees swarm either to enlarge the size of the colonies or to find a new location, in both case the bee swarmers are not aggressive. The passive swarm is due to the fact that while on the move, there are no young to protect or honey to defend.

The African bee's aggressive behavior is a defensive response. You can expect three to four times more bees to come to the defense of a colony. Ten times more stings. The greatest risk group is small children, elderly handicapped, pets and livestock. Other groups include outdoor workers, military personnel, sports enthusiasts, rescue personnel - just about anybody in their path. I am equipped with an EpiPen at all times when dealing with killer bees.



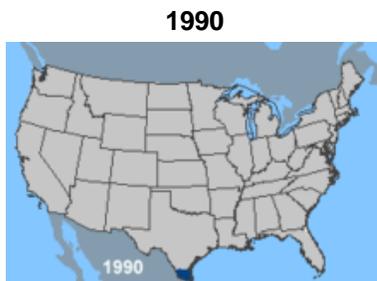
EpiPen used to treat life-threatening allergic reactions caused by insect bites



Facts on Bees

Honey bees are cold blooded, they have a body temperature close to ambient, and they don't hibernate in the winter. Bee hives maintain close to the same average temperature in both cold and hot climates, both summer and winter.

They generate heat by clustering together, thus emitting lots of energy. They use air currents they create within the hive to maintain a uniform temperature in the hive and hive temperature can be as high as +122° F. Bee hives are a easy target for IR to find, however, the temperature in hives varies with size and population.



www.wikipedia.org



<http://www.beebehavior.com>



The Africanized bees have spread from Southern Texas from 1990 to 2011, East and Central Texas, Arizona, New Mexico, Florida , Louisiana, Arkansas, New Orleans, Georgia, and Southern Utah and are continuing to spread.

The first death by Africanized bees was in 2002 in Okeechobee County, Florida and many more have been reported since. In metropolitan areas such as Miami Dade, Palm Beach, Brevard and Lee Counties, these bees have been an even greater problem. Unfortunately there will be many reports of this nature in the future. We have no wide scale control method at this time other than inspections to locate and eliminate hives in municipalities, homes and businesses.

Killer bees have killed animals and humans, but their venom is no more deadly than the native honeybee. The difference is that Africanized honeybees are more aggressive. Researchers have been working on insulating the “mean gene” to possibly reduce the spread of the Africanized traits.



Therefore, the need to locate bee hives in homes and buildings in an urban environment leads to IR pest thermography. There is no better way to locate and assess bee hives and the collateral damage that occurs from the infestation in structures. Townships, cities, states, federal government agencies and commercial property owners are liable for harm caused by this insect occurring on or resulting from their property or facility. Programs are being considered as to how best to respond to these types of attacks; however, to react to Africanized bee attacks is not enough. The inspecting, monitoring and documenting bee activity in public or common areas that are likely to harbor hives makes good sense. If you think about an IR program for Africanized bees, it can be easily marketed to commercial, residential, or industrial property owners.

Exterior inspections for bees are best performed at night. When inspecting for killer bee hives keep in mind that not all honey bee hives have been Africanized. When properly suited up I often use myself as bait by getting close to the hive to assess their behavior. Africanized bees will quickly organize and attack.



Please don't try this at home

Proper equipment should be considered to protect yourself from being stung.

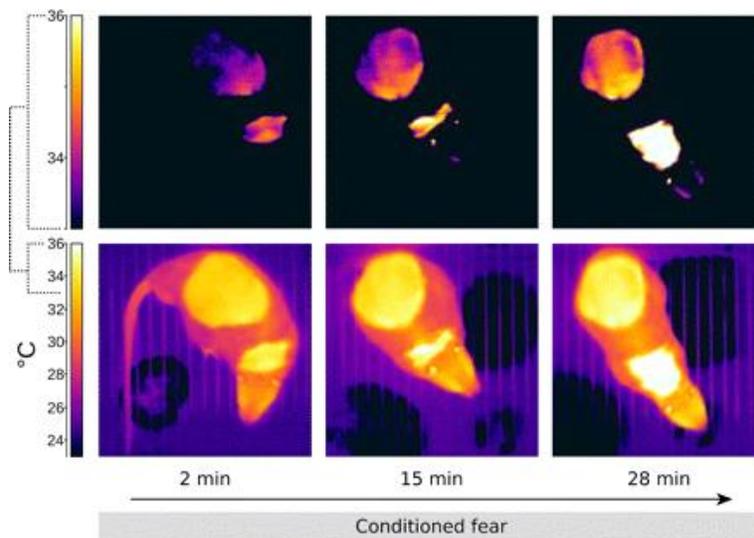
If not and you are attacked:

- Don't swat bees
- Run don't - stay still
- Cover your nose and mouth
- Dive in water (if possible)
- If stung, scrape off the stinger with your fingernail or credit card
- Seek medical attention
- Call a pest company to remove the hive
- Being aware of your surroundings and taking simple precautions is the best defense against Africanized honey bees. They will only attack if they feel threatened they will defend the hive. Loud noises, pets such as dogs, or poking around bushes is not advisable.



Norway Rat (*rattus norvegicus*)

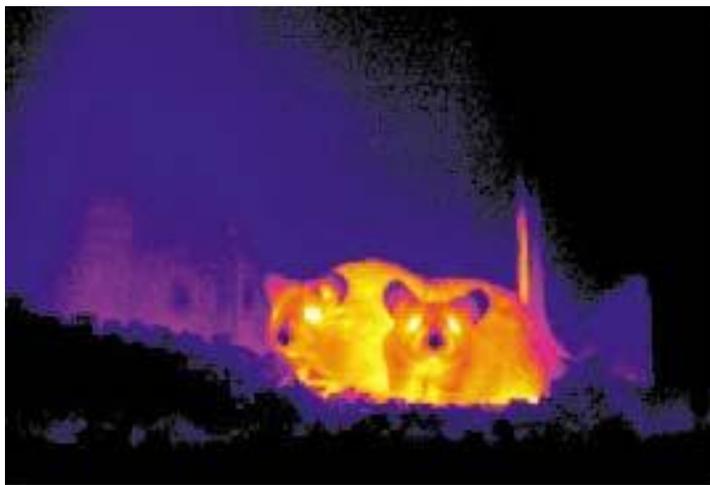
There are other pests that have a thermal trail for the IR pest thermographer to discover and track such as rodents. Rats control their body temperature through their tails by dilating or constricting their tail blood vessels. A cross section of the base of a rat's tail at two different body temperatures (37° and 40°C or 98.6° and 104°F) is shown below. The Norway rat or laboratory rat *rattus norvegicus* has a typical body surface area of 10.5 and a body temperature of 38° - 39°C or 100.4° - 102.2°F. An important fact to remember about conducting thermal rat inspections is that they can change their body temperature based on stress or fear.



Time lapse infrared images showing changes in surface temperature during a 30-min test of conditioned fear in the same rat. The top panel shows the same series of images as the bottom panel but with a magnified temperature scale. Note the gradual warming of the interscapular area, which is greater and starts earlier than that of the lumbar back (*top*), as the fear response progresses. The cooling of the tail is also visible (*bottom*).

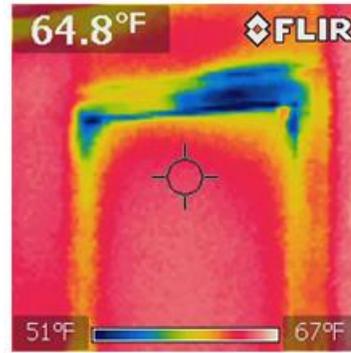
“Active Thermography (AT) is defined as applying a stimulus to a target to cause the target to heat or cool in such a way as to allow characteristics of the target to be observed when viewed by thermal imagery“. In the case of the IR Rat inspection if AT is used you will need fear to excite your target for the best results. Fear can be established by knocking on the walls or ceilings or by inducing diluted liquid ammonia in small doses to unclosed spaces where you found or suspect rat activity. The scent of ammonia triggers a fear response in the rodent. It will relate that scent as it being the urine of a large predator. As rodents become fearful they will want to flee, so have a capture plan and exercise caution when exposing them or removing them from enclosed spaces.

Pest thermography as a new revenue stream for an existing company or to jump into the pest industry full time - in either case you will find work quickly if you use creative marketing. Earlier in this paper we talked about inspecting exotic termites four times per year and how IR bee inspection contracts are becoming more popular with local and federal government agencies and in the private sector. What has worked for me is creating bundles or packages for these IR applications and take your service to the marketplace.



IR image by William Decker, CMI

The pest industry is a great market particularly with the pests we have been discussing. All three are hardly affected by a slow economy. Most people will find the funds to correct an Asian termite infestation or they risk the very real fact that they are going to soon lose their home or when aggressive Africanized bees swarm a home terrorizing and harming humans, pets, and livestock or when rodents have taken over your living space and the pest company you hired has failed get rid of them.



Typical IR signature of a carpenter ant nest over a doorway

An other lucrative pest is the carpenter ant. There are several varieties but what is good for pest thermographers is in most of North America. Carpenter ant colonies in wall voids are also readily found as seen above. The cold thermal pattern is the nest. You can expect thousands of ants being accommodated by a typical nest. Keep in mind that carpenter ants are nocturnal feeders. A carpenter ant thermogram looks similar to a leak. A sure way to identify that what you are seeing in your viewer is in fact a nest is to tap on the areas of the wall where you suspect the nest to be. This causes vibrations that will alert several ant soldiers and they will come out to investigate even in the day time. Thus, the pest operator you are working with can positively ID the bugs, now that are exposed.

Conclusion

Pest thermography can be a good candidate to many of you that read this paper, for those who want to move forward here are some tips:

Sign up for a pest thermography course. I recommend the course offered by Infrasppection Institute - I know for a fact that the information you receive will be valuable and helpful when performing IR pest inspections, as well as keeping you within the industry standard. Always conduct IR pest inspections with a licensed pest and termite operator or an agent thereof in the state that the inspection is being conducted.

Choosing a new revenue stream is a not easy. Good research will prove to be a good place to start. In any case, you will find work quickly if you use creative marketing techniques. If you remember, earlier we talked about inspecting exotic termites four times per year and how IR bee inspection contracts are becoming more popular with local and federal government agencies as well as the private sector. An example of what has worked for me is creating bundles of IR pest applications and selling them under a renewable annual customer agreement. I combine IR termite and IR bee hive quarterly inspections proposed as an annual service agreement to government agencies, payable quarterly. This will produce cash flow, reoccurring annual income, and adds to the net worth of your company. I hope this paper has opened the door for you to consider IR pest thermography as a part of your future.

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ishomeinspections.com

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Dept of Agriculture and Consumer Services (DACS)

UNEP/FAO/Global IPM Facility Expert Group on Termite Biology and Management