



DON'T JUMP

Considerations in regard to rooftop gardens and the structural pest manager.



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Disclaimer

In this presentation, I am not incorporating the positives that Greenroofs may offer, nor the educational opportunities they may afford for observation and appreciation of insects, but am focusing exclusively in relation to the challenges they may pose in terms of pest management primarily in New York.

In that regard, Greenroofs and the potentially more problematic small to commercial size roof top gardens are changing both our macro and micro urban landscape. Through their creation of bio diverse ecosystems, it is inevitable that pest related issues will emerge.

Why should we be concerned?

- ✓ **INSECTS**
 - ✓ FIND A WAY
- ✓ **HUMANS**
 - ✓ MISCALCULATE
 - ✓ HAVE TUNNEL VISION
 - ✓ HAVE BUDGETS - CAN BE DRIVEN BY TAX
 - ✓ ABATEMENTS & ECONOMIC INCENTIVES TO MAKE ILL CONCEIVED DECISIONS
 - ✓ GENERALLY UNDERESTIMATE INSECTS
- ✓ **EVENTS**
 - ✓ HAPPEN

What triggers an inspection?

- Complaints
- Scope of service...maybe

What the inspection may find

- Moisture related arthropods due to roof moisture issues
- American roaches emerging from rooftop sewer vent pipes
- Wasp nests sometimes around roof top water tanks
- Beetles and mites as a result of accumulated organic debris or bird nesting
- Water accumulation which allows for mosquito populations
- Wildlife such as rats, bats, squirrels, raccoons and birds.
- And of course the odd cases some with great stories

With an increase in "Greenroofs," the very conditions which were previously considered problematic will now become the norm along with **the calculated introduction of the food, water and shelter which insects require to thrive**. Not to mention the deliberate and accidental mechanical introduction of both friend and foe alike.



In their own words:

"Insects, spiders and other arthropods on green roofs are not uncommon. Actually, long term studies show that **arthropod colonization on green roofs, whether one-story tall or 20-stories tall, mimics ground level colonization, sometimes with even greater diversity**. Arthropods are a vital component for any healthy ecosystem and their diversity in an ecosystem keeps pesky and damaging arthropods in check."

But what happens when things go awry?

- Do termites not eat through many types of barriers from cable insulation, pool liners and PVC, not to mention wood?
- Do ants not forage considerable distances?
- Do flies, beetles and bugs not fly?
- Do mites not find their way through the smallest of gaps?

Statements like the previous slide, as anyone with a knowledge of insects and their abilities knows, overflows with hubris.

We know hubris has a way of attracting pests.

Challenges to Pest Management Professionals

COMMUNICATION

Does the location have or is contemplating a Greenroof?

Sometimes the first we know of a Greenroofs' existence is when weird bugs start showing up in upper floor environments or UV lights.

It is important for pest professionals to be a part of this endeavor early on.

Be viewed as part of the solution (a concerned resource), not as an enemy.

Challenges to Pest Management Professionals

EDUCATION

PMPs have long been required to be jacks of all trades and master of one.

It seems that for some, this may need to be one more field we will need to gain a basic understanding of as these *once* residential or commercial buildings become multi-use structures.

Challenges to Pest Management Professionals

IDENTIFICATION

With the installation of these new artificial environments, we may need to upgrade our identification skills to include a host of new arthropods.


You might consider getting better acquainted with your friendly local cooperative extension agent or similar person!

It's a what?!


Along with challenges caused by an influx of "Ag" insects into our urban environment, there will be a need for client education as to what some of these new-found "creepy crawly" critters are.

Establishment of realistic action thresholds, especially for such odd and **dangerous** creatures like this Black swallowtail caterpillar, not to mention assorted hornworms.

In some instances you may need to remind them diplomatically using science as to why there may be an increase in insect activity and that it may be related to their Greenroof decision.



Enhanced environment for previously associated pests



Roofs have historically posed pest opportunities such as the case with migrating American roaches finding roof top shelter and moisture. Now for these roaches, along with other species such as wood roaches which may be introduced in soil or wood chips, they will be able to enjoy a veritable penthouse address with plenty of food and harborage and a possibly pesticide free zone. Where will the populations expand to or migrate to if or when climactic conditions change.

Mosquitoes may also find an abundance of breeding and safe resting spots, especially for some of the newer possible vectors like the Asian Tiger mosquito *Aedes albopictus* who have reduced water requirements.

Insects in Green Roof Close Cumbria School


The above headline refers to a school in Cumbria which is located in North West England which had to be closed when over twenty students were bitten by harvest mites (chiggers) which relocated through air ducts from the green roof above into classrooms.

Among the most serious issues we may have to deal with is the potential of negatively impacting arthropods finding their way into the occupied spaces we are responsible for. These will include nuisance pests but may also include those which may bite or sting.

An apilary may be fine for the roof top garden but mechanical IPM measures may need to be taken to prevent them from entering the work environment just a few feet below.

Assorted biting and stinging arthropods which may be associated with Greenroof projects

- Mites
- Thrips
- Ants
- Wasps & Bees
- Spiders
- Flies
- Mosquitoes
- Assorted predators, bugs, etc.
- Not to mention the vertebrates




Gaining Perspective: Ecology Magazine, Ecological Society of America Sept 2013

- Green roofs aren't just isolated islands of nature—they're also steppingstones for flying insects such as bees, scientists have found.
- While it's clear that green roofs can boost biodiversity in cities, scientists didn't know whether these patches could act as connected habitat.
 - 40 green roofs in Zurich, Switzerland, with plants ranging from succulents to meadow species.
 - From May to September 2010, the researchers caught 48,084 ground beetles, spiders, weevils, and bees from nearly 500 species on the green roofs and at corresponding green spaces on the ground.
- The team then looked for links between the arthropod communities and factors such as the size of the roof, the amount of flowers, and distance to the nearest green roof or other habitat.
 - For ground beetles and spiders, the local environment had a big influence on the species present.
 - For flying bugs such as bees and weevils, "connectivity was by far the most important variable."

As anyone familiar with pest management knows, no pest issue would be complete without the potential for regulatory interaction. This is not to say that there are no areas of concern and that informed oversight is not needed, but the operative terms are informed and educated oversight based on an understanding of these new multi use structures and not the same old approach based on antiquated linear interpretations by attorneys who deal in etymology as opposed to entomology.

One example: To treat for a pest issue on the roof which is the cause of an interior effecting issue, which category is required?



1A	AGRICULTURAL PLANT
3A	ORNAMENTALS, SHADE TREES & TURF
3B	TURF
3C	INTERIOR PLANT MAINTENANCE
7A	STRUCTURAL & RODENT CONTROL
7G	COOLING TOWERS, PULP & PAPER PROCESS
8	PUBLIC HEALTH PEST CONTROL

Protection of Apiaries and Foraging Bees

Any pesticide use must address and include an added awareness in regard to bees and new label verbiage since a number of gardens may include hives in a new proximity matrix to possible structure infesting pests.



Conclusion & Observations

- It is essential to develop a basic understanding of the dynamics involved with Greenroofs among pest management professionals who may encounter them.
- An avenue of communication between the PMP, property or facility management and Greenroof personnel should be developed as early as possible.
- The implementation of IPM principles by all parties is essential to reduce unwanted pest issues.



Thank You, Gil Bloom
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