

FIGHTING DR. MOON DENIALS

Based on Mold Growth Profiles



Revised 12-23-21



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NAERMC

National Association of Environmentally
Responsible Mold Contractors



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Per EPA

Mold Starts to Grow Fast

- This presentation will show that, as per EPA & FEMA guidance, after a water event mold starts to grow fast... immediately after the water event.
- This may be a different story elsewhere in the country but in hot, humid, moldy (tropical) South Florida, mold grows fast after a water event.

Mold grows fast in — tropical climate — South Florida after a water event.



Fast Mold Growth



Since mold grows fast — heavy mold well before 14 days — simply finding mold may not be used to date the duration of a water event.



Finding mold cannot be used as a basis for coverage denial.



Mold grows fast in — tropical climate — South Florida after a water event, and simply finding mold may not be used as a basis for coverage denial.

SECTION 1

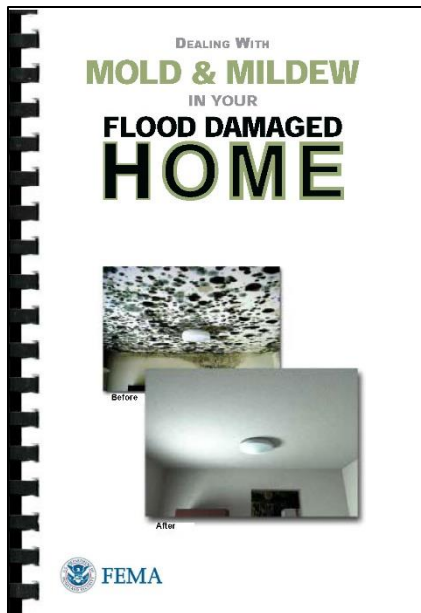
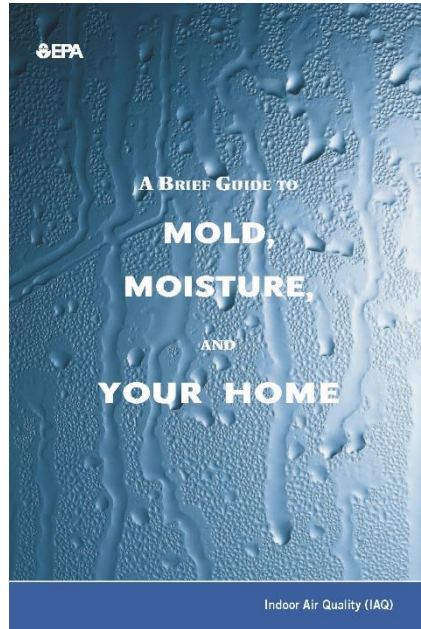
Since mold grows fast — heavy mold well before 14 days — simply finding mold may not be used as a basis for coverage denial.

Mold Starts to Grow in 24–48 Hours. Or does it?

- It is generally accepted [outside of the Insurance Industry] that molds will/can start to grow (germinate) quickly after a water event.
- According to the US EPA: “It is important to dry water-damaged areas and items ***within 24–48 hours to prevent mold growth.***”
- Per **FEMA** mold growths, or colonies, can start to grow on a damp surface ***within 24 to 48 hours after a water exposure.***



Federal Guidance Disregarded



- We review several flawed insurance industry funded studies that have concluded (contrary to EPA & FEMA guidance) mold growth is slow — takes many weeks or months for mold to start to grow, therefore if mold is found deny coverage based on long term, continuous leakage.
- On the contrary, because mold grows fast (always before 14 days) and because mold represents permanent damage that cannot be restored by drying, **finding mold triggers coverage.**

US EPA & FEMA Guidance Disregarded by Insurance Experts

- In Section 1 we look at these insurance industry funded studies to see if there is anything to them at all or they are flawed/ junk science.



Michael Krause, Veritox Inc.

[J Occup Environ Hyg](#) . 2006 Aug;3(8):435-41. doi: 10.1080/15459620600798663.

Controlled study of mold growth and cleaning procedure on treated and untreated wet gypsum wallboard in an indoor environment

Michael Krause ¹, William Geer, Lonie Swenson, Payam Fallah, Coreen Robbins



Widely referenced by Dr. Ralph Moon (leading insurance defense expert) and his followers: The Veritox work concludes: “21 days before mold growth was visible”.



According to the study authors: This work was designed to model a typical moisture intrusion episode involving discovery of mold growth. But does it?

Veritox is a private engineering firm that provides engineering support to Insurance Carriers.

Veritox Experimental Conditions



- Pacific Northwest relative humidity (RH) in the room typically ranged from 45% to 65% RH.
 - Not applicable to tropical S. Florida.
- Water source: Bottled drinking water.
 - Not applicable to an actual water event in a home or office where water starts as clean but runs over dirty floors or carpets; or leaks from kitchen waste line; or drips from a roof leak over dirt in attic; etc.

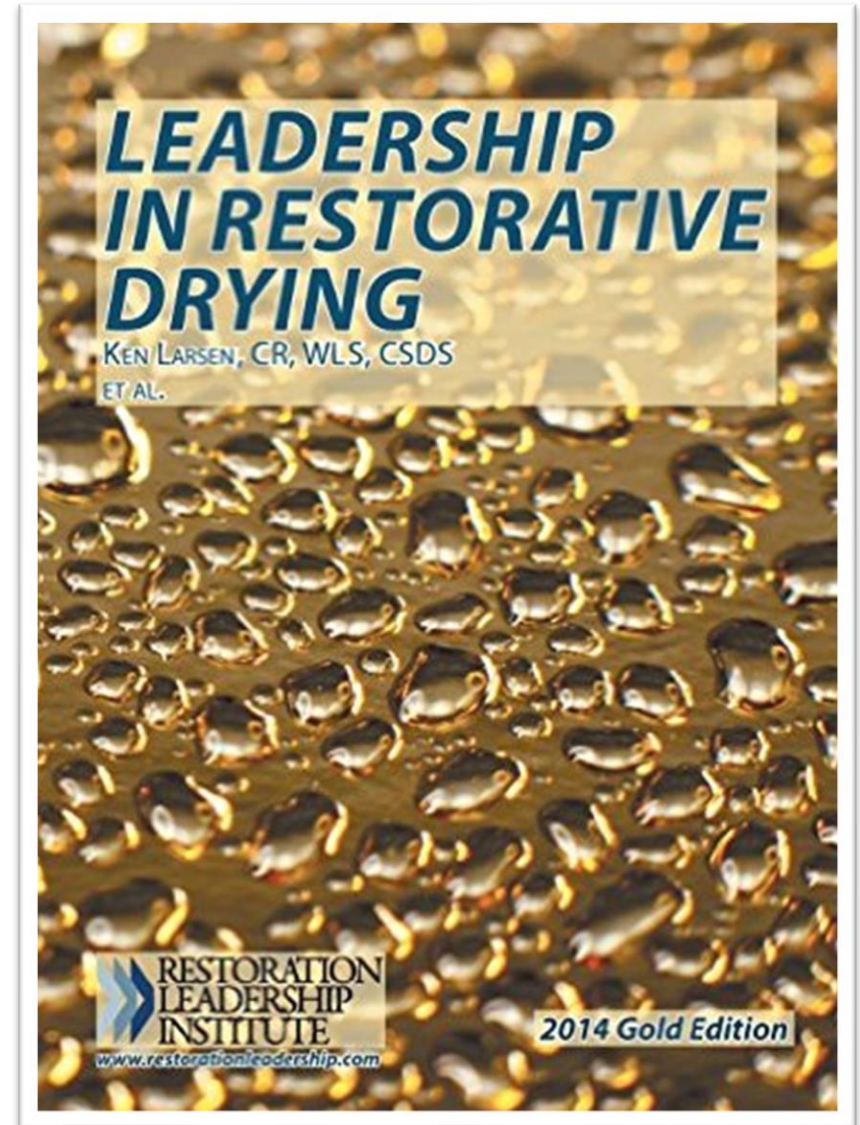
Water Source: Bottled drinking water.



Is bottled water a good choice as a water source to model a water event?



According to Ken Larsen and the Restoration Leadership Institute in his well regarded book *Leadership in Restorative Drying*, 8 hours after a water event, clean water is generally no longer clean. It is microbial contaminated.



Water Source: Bottled drinking water.



Areas under cabinets not clean... always full of dirt and insect remains ... and mold spores.

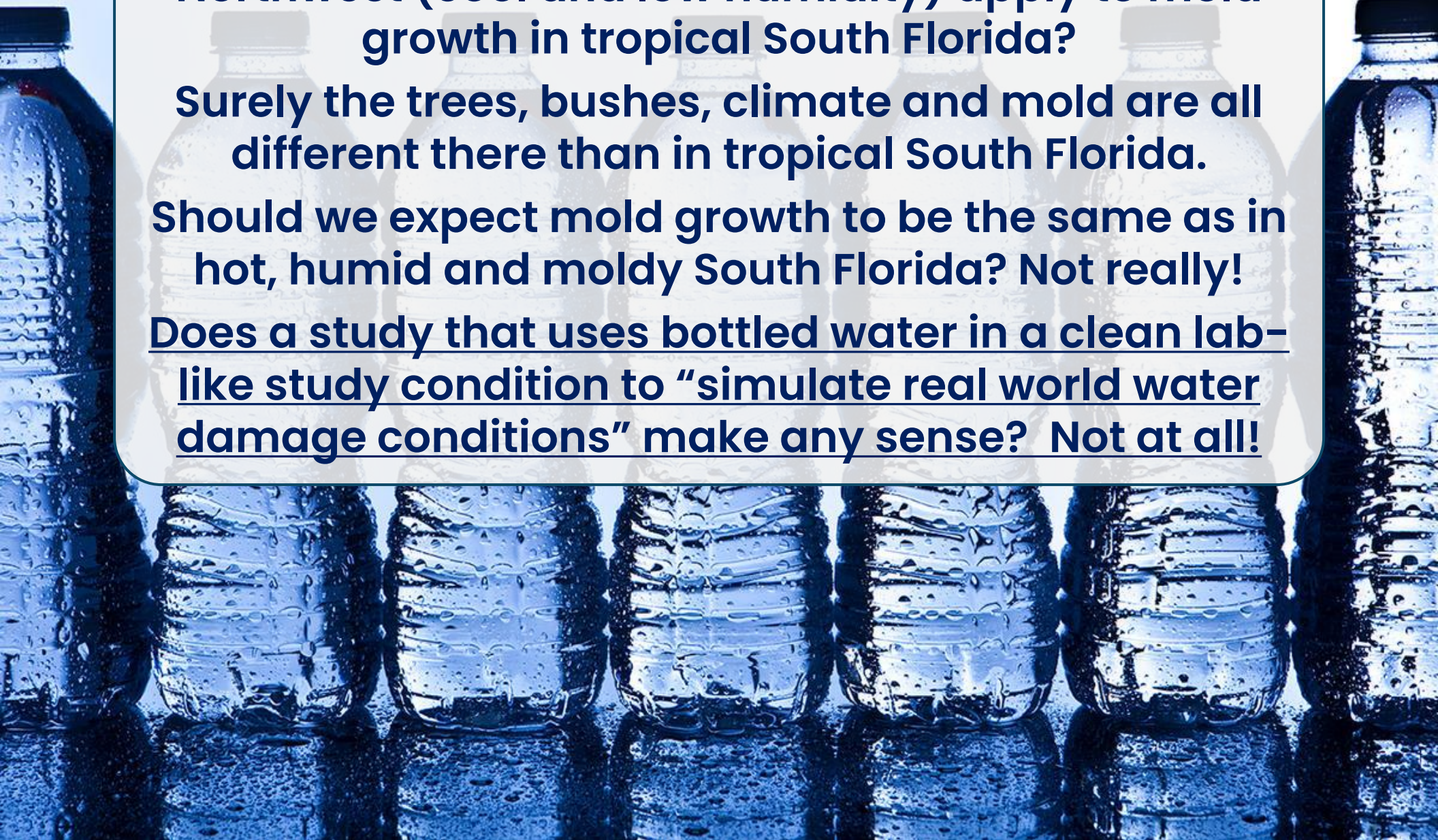
- Clean water comes into contact with mold & bacteria spores from the indoor air and in settled dust to quickly become unclean water supporting subsequent mold and bacterial growth. There's always mold spores in a real world water event!
 - Mold spores from soils outside are tracked in on shoes and by pets.
 - Airborne mold from the outside or from dirty air ducts collects in the settled dust on floors — carpet, tile, & wood.
 - And neither wall cavities nor areas under cabinets are clean.

Does a study on mold growth in the Pacific Northwest (cool and low humidity) apply to mold growth in tropical South Florida?

Surely the trees, bushes, climate and mold are all different there than in tropical South Florida.

Should we expect mold growth to be the same as in hot, humid and moldy South Florida? Not really!

Does a study that uses bottled water in a clean lab-like study condition to “simulate real world water damage conditions” make any sense? Not at all!



Veritox paper is widely used by insurance defense experts to explain that if mold is present, the water event happened more than 14 days earlier, therefore there was a failure to mitigate and the claim should be denied.

But in tropical South Florida under real world conditions, as we will show, the start of visible mold growth on wet drywall is seen by day 6-7 and heavy mold several days later.

Either the Veritox paper is flawed or testing for mold growth in the Pacific NW is not applicable to tropical South Florida ... or both.

Richard Driscoll CLEANFAX Article



CLEANFAX
FOR CLEANING + RESTORATION PROFESSIONALS

RESTORATION

HOW LONG DOES IT TAKE MOLD TO GROW?

Only science and testing can provide the answer.



Dr. Ralph Moon also references ... a Driscoll article published in the non-peer reviewed magazine Cleanfax that states that it takes a “full 18 days until we could see visible mold growth” on drywall.



Experiments were done in Pittsburgh (not tropical South Florida).



Tap water was used to “simulate flood water”.

Driscoll states in his article: "But Krause's test, which is really quite representative of a normal indoor environment, illustrates that it was 21 days before mold growth was visible."

Anyone that says that the Krause's [Veritox] test was quite representative of a normal indoor environment following a water event ... well we have our doubts.

Dr. Michael Berry's Industry Sponsored Study

- Dr. Moon also refers to Dr. Berry's experiments: Performed in a clean lab in Indiana.
- Did not display visible mold until week five (35 days)

**FINAL REPORT OF THE HYDROLAB PROJECT 2001
FLOORING, HUMIDITY, AND MOLD GROWTH**

PREPARED FOR THE CARPET AND RUG INSTITUTE

By

Dr. Michael A. Berry
Principal Investigator

Karin Foarde, Carey Mitchell, Kurt Bolden, Cass Walton, Rachel Adams
Research Team

FEBRUARY 20, 2002

No doubt if you try to grow mold in a clean room — clean experimental chamber with clean water and clean materials you will find little if any mold growth. But in hot, humid, moldy South Florida under real world conditions we see the start of visible mold growth by day 6-7 and heavy mold several days later.

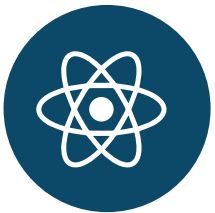
These Works Flawed? Junk Science?



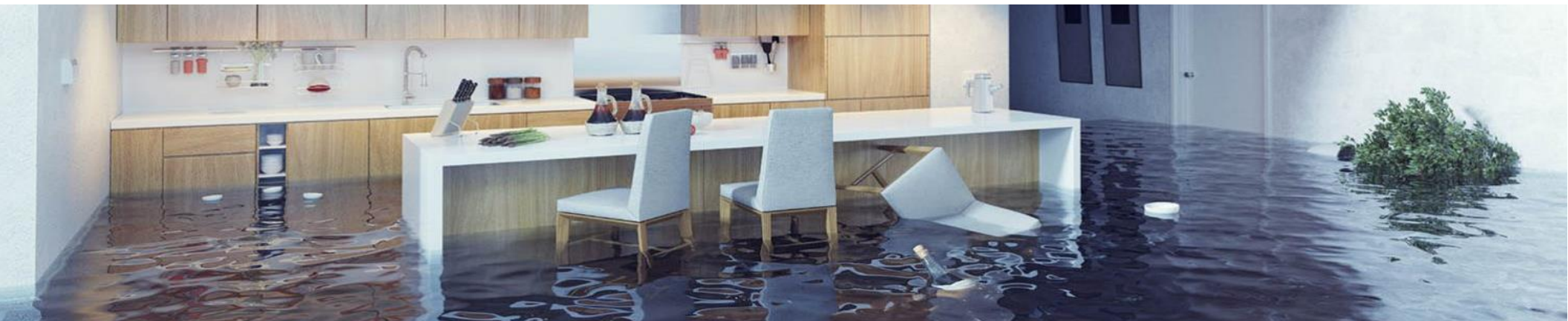
These three (Insurance Industry sponsored) studies conclude that mold is never found before 14 days after a water event.



Are these studies applicable to real world conditions in South Florida (hot, humid, plenty of mold spores necessary for germination always in the air, soils and on floors?)

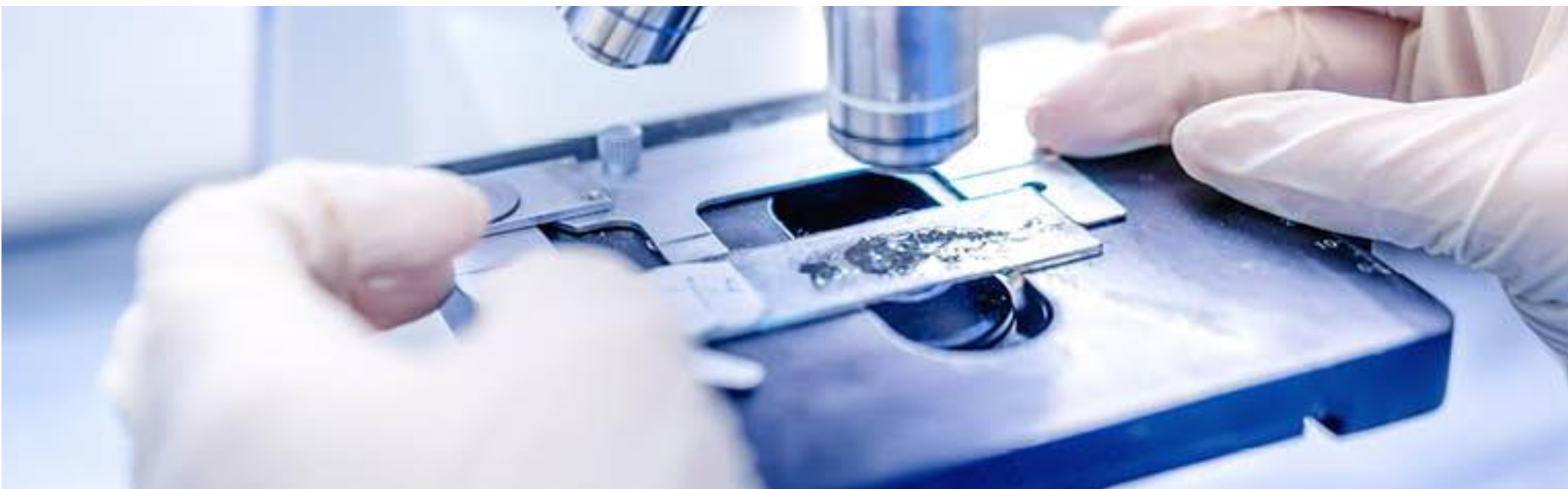


Or are these studies flawed/junk science?



These Works Flawed? Junk Science?

- Seems like we (mold remediators and mold assessors) are almost always finding mold growth after water events that are “dried out” by or before day 14 which would contradict the Veritox, Driscoll & Berry claims of slow mold growth.
- Note: None of these so-called studies have been published in peer reviewed scientific journals.
- Note: All of which contradict Federal (EPA/FEMA) guidelines.
- But what about real peer reviewed scientific papers that refute these insurance industry sponsored [fake science] so-called studies.



Careful Peer Reviewed Studies

- Section 3 we will look at careful **peer reviewed studies** that find just the opposite of what Veritox, Driscoll, Berry find:
- Mold growth is fast! Just like the EPA & FEMA says.
- Then later on we present our own studies that also find mold growth is fast. Just as the EPA & FEMA say... contradicting Veritox, Driscoll, Berry claims of slow mold growth.



But next, let's take a look at what Peer-Review means.

SECTION 2

Peer Review Process



Ralph Moon Opines: Stachybotrys Takes 3–4 Months to Grow



- [Dr. Moon] Has conducted an extended length lab study (>200 days) of effect of moisture on wall system construction: confirms a natural succession of species.
- Fungal amplification affected by: water activity, available sugars, enzymatic effect of fungi. Aspergillus grew first, other opportunistic fungal species include: Cladosporium, Chaetomium, Curvularia and Bipolaris. **Opined 3–4 months required for Stachybotrys to grow.**

Rather than relying on work published in scientific journals peer-reviewed by independent, external experts ...

Dr. Moon performs his own (non-published) experiments claiming/ opining that Stachybotrys takes 3–4 months to grow. Therefore, deny claim based on long term leak.

How Do Carrier Forensic Engineering Companies Get People to Accept Their Opinions Based on Their Own Work? They Call Their Work “*Peer Reviewed*”

- When an article (even the worst junk science) is called “*Peer Reviewed*” it is considered blessed / untouchable / not able to be criticized.
- Any time you critique the (what they call “peer reviewed”) article, the defense attorney will ask: Why do you think your non-peer reviewed, unpublished comments can be used to comment on [Moon’s] peer reviewed, published studies?
- So Carrier Forensic Engineering Companies call everything “Peer Reviewed.”



Moon “Studies”. Not Science

- None of the Moon studies or Moon referenced studies were performed more than once.
 - (They did not repeat any of the experiments.)
- Nor was the work ever reproduced by others.
- The work does not in any way meet the requirements by the National Academy of Science in terms of Reproducibility and Replicability.
- (Nor was it peer reviewed by independent, external experts.)
- **Therefore NOT SCIENCE.**

Reproducibility and Replicability in Science

Reproducibility and Replicability in Science

Committee on Reproducibility and Replicability in Science

Board on Behavioral, Cognitive, and Sensory Sciences
Committee on National Statistics
Division of Behavioral and Social Sciences and Education

Nuclear and Radiation Studies Board
Division on Earth and Life Studies

Board on Mathematical Sciences and Analytics
Committee on Applied and Theoretical Statistics
Division on Engineering and Physical Sciences

Board on Research Data and Information
Committee on Science, Engineering, Medicine, and Public Policy
Policy and Global Affairs

A Consensus Study Report of
The National Academies of
SCIENCES • ENGINEERING • MEDICINE

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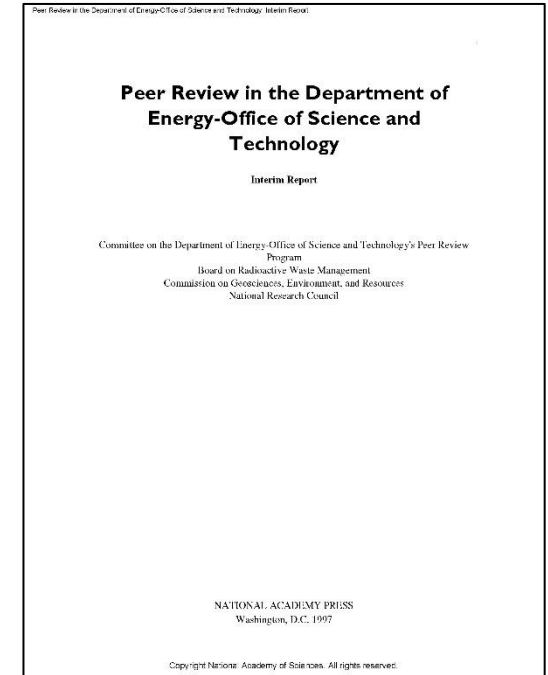
https://www.ncbi.nlm.nih.gov/books/NBK547537/pdf/Bookshelf_NBK547537.pdf

Peer Review According to the Department of Energy Office of Science and Technology (OST)

USE OF THE TERM "PEER REVIEW"

One such problem has been the OST's [Office of Science and Technology] use of the term "peer review" to refer to technical reviews conducted by EM technical staff or other reviewers not independent of the project under review. Such use of the term "peer review" has caused confusion and misunderstanding within both OST and external review groups (e.g., NRC, GAO), which have continued to criticize OST for a lack of a credible peer review program.

To avoid misunderstanding, OST should restrict the term "peer review" to only those technical reviews conducted by independent, external experts.

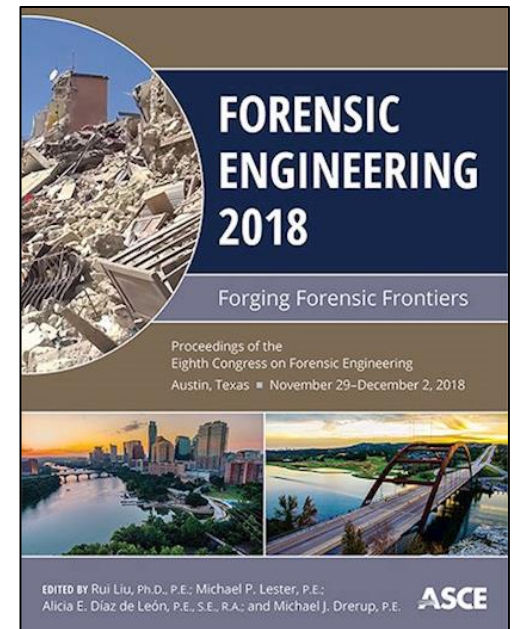


<https://www.nap.edu/download/5939#>

The term "peer review" is restricted to only those technical reviews conducted by independent, external experts.

Nothing Presented by Moon Is Peer Reviewed by Independent, External Experts

- Carrier defense expert studies are presented orally at Forensic Engineering Symposiums to give them the stamp of respectability.
- And then published on-line in *Forensic Engineering* proceedings again to give them the stamp of respectability.
- Then called “peer reviewed” although by any accepted definition of peer review (outside of the insurance industry) these are not in any way shape or form ... peer reviewed.
- The work always includes many charts and figures in order to appear to be scientific looking. But charts and graphs do not = peer reviewed.



None of Moon work or work referenced by Moon is published in Peer Reviewed scientific journals. None reviewed by Independent, External Experts. All work paid for by Insurance Carriers.

None meet the accepted criteria for Peer Review. Not science.

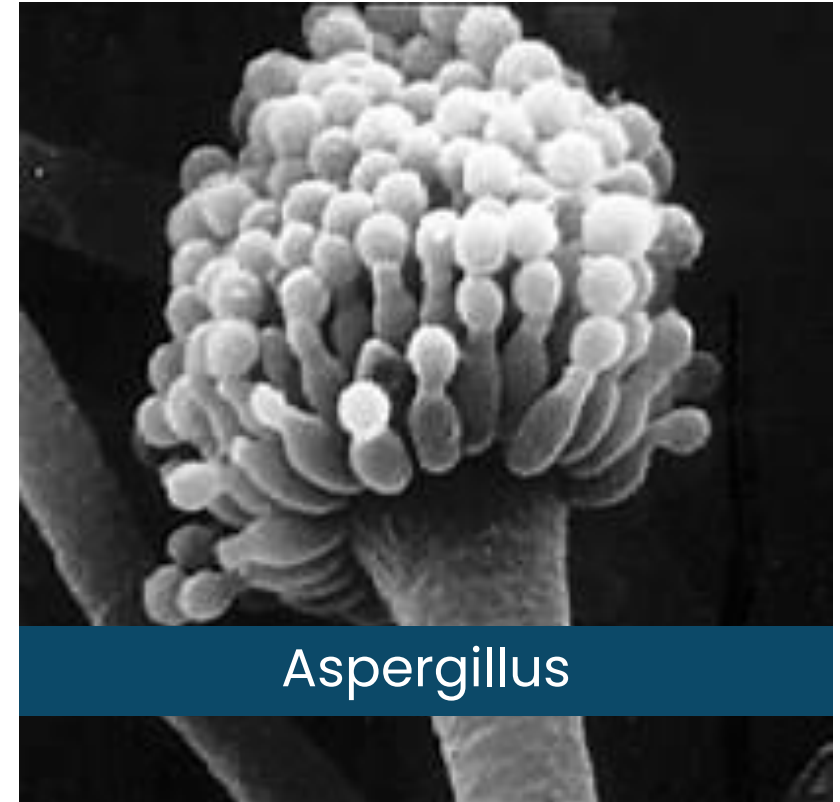
A person with long brown hair, wearing a dark grey hoodie and blue nitrile gloves, is cleaning a wall. They are using a yellow sponge in their right hand and a spray bottle of green liquid in their left hand. The wall is white and has large, dark brown mold patches. The scene is dimly lit, with the person's face partially visible in profile.

SECTION 3

**Published research that finds just the
opposite of what Veritox, Driscoll, Berry
find — Mold Growth is
*Fast***

Primary Colonizers

- **Primary Colonizers** are the first molds to grow after a water event as moisture starts to accumulate.
- They can start to appear in days.
- The primary colonizers are capable of growing (germinating) at water activities below 0.85. (Not very wet.)
 - This group include most species of *Aspergillus* and *Penicillium*.



Primary Colonizer is a term related to the first molds to appear as moisture starts to accumulate.

Secondary Colonizers



Cladosporium

- **Secondary Colonizers** are often the second group of molds to grow as things get wetter.
- Secondary colonizers germinate best at water activities of 0.85 to 0.90. (Wet.)
 - Secondary colonizers include most common species of Cladosporium and Aspergillus flavus.

Secondary Colonizers is a term related to the second set of molds to appear as things get wetter and wetter. But if there is a flood and everything gets soaked, they will start to appear immediately.

Tertiary Colonizers

- **Tertiary colonizers** generally appear last as these need very wet conditions and more time to germinate.
- More time does not necessarily mean weeks or months as we will see.
- At water activities greater than 0.90 (Very wet), tertiary colonizers appear.
- These include *Stachybotrys* and *Aspergillus fumigatus*.



Stachybotrys

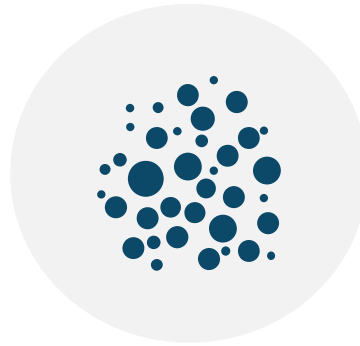
As with Secondary Colonizers if there is a flood and everything gets soaked, Tertiary Colonizers will start to appear immediately.

Independent Studies Prove Fast Mold Growth

Independent Studies Prove Fast Mold Growth and not only for Primary Colonizers.



First we present a peer reviewed, Korean Government funded study showing fast mold growth on wall paper including **rapid growth of Stachybotrys mold.**



Next a study by EMLabs where a full spectrum of mold was growing from an outside air spore sample after only 7 days.



Next is a peer reviewed European study of **rapid growth of Stachybotrys mold on drywall.**

Korean Government Study: Mold Growth Visible in 3-4 Days

Mould germination and the growth rate on wallpapers with different physical properties and the surface structures

Seung Ho Ryu, Hyeun Jun Moon

First Published March 21, 2014 | Research Article



<https://doi.org/10.1177/1420326X14524808>

- In a relatively recent peer reviewed published study funded by the Korean Government:
 - Aspergillus mold was observed growing on wall paper after only 3 days of incubation.
 - **Stachybotrys was observed growing on wallpaper after only 5 days of incubation.**



Eurofins (EmLab) Data

- *Aspergillus*, *Cladosporium*, *Penicillium* from mold spores collected from the outside air within 7 days. See table next page ...
- Fast mold growth consistent with germination (starting to grow) within 24-48 hours.



Eurofins (EMLab) 7 Day Test Results



- Full range of mold growth after 7 days (Aspergillus, Cladosporium, Penicillium) from mold spores sampled from the outside air.
- As is commonly found, there is little to no Stachybotrys in the outside air. No spores to germinate, means that Stachy will often be slow to appear. Does not mean that it is slow growth.
- Stachy is common in indoor dusts.
- Flood waters pick up Stachy from indoor settled dusts and can start to grow immediately.

CULTURABLE AIR FUNGI REPORT			
Location	I: Outside Reference		
Comments (see below)	None		
Lab ID- Version	4591077-1		
Medium	MEA		
	Raw ct	%	cfu/m3
Acrmonium blochii			
Alternaria alternata	1	3	12
Aspergillus niger	2	6	24
Aspergillus sydowii	2	6	24
Aspergillus ustus			
Aspergillus versicolor	1	3	12
Aureobasidium pullulans	12	33	140
Cladosporium cladosporioides	2	6	24
Cladosporium sphaerospermum	1	3	12
Epicoccum nigrum	2	6	24
Non-sporulating fungi			
Paecilomyces lilacinus	8	22	94
Penicillium aurantiogriseum	2	6	24
Penicillium brevicompactum			
Penicillium decumbens			
Penicillium purpurogenum			
Penicillium variable	12	7	7
Rhizopus stolonifera	24	7	12
Stachybotrys chartarum			

But What About on Drywall?



The Reeslev (European) study focuses on growth of *Stachybotrys* mold on culture media and on drywall.



The tertiary mold *Stachybotrys* starts to grow quickly after incubation both on culture media & drywall.

Reeslev Study

APPLIED AND ENVIRONMENTAL MICROBIOLOGY, July 2003, p. 3996–3998
0099-2240/03/\$08.00 + 0 DOI: 10.1128/AEM.69.7.3996–3998.2003
Copyright © 2003, American Society for Microbiology. All Rights Reserved.

Vol. 69, No. 7

Quantifying Mold Biomass on Gypsum Board: Comparison of Ergosterol and Beta-*N*-Acetylhexosaminidase as Mold Biomass Parameters

M. Reeslev,^{1*} M. Miller,¹ and K. F. Nielsen²

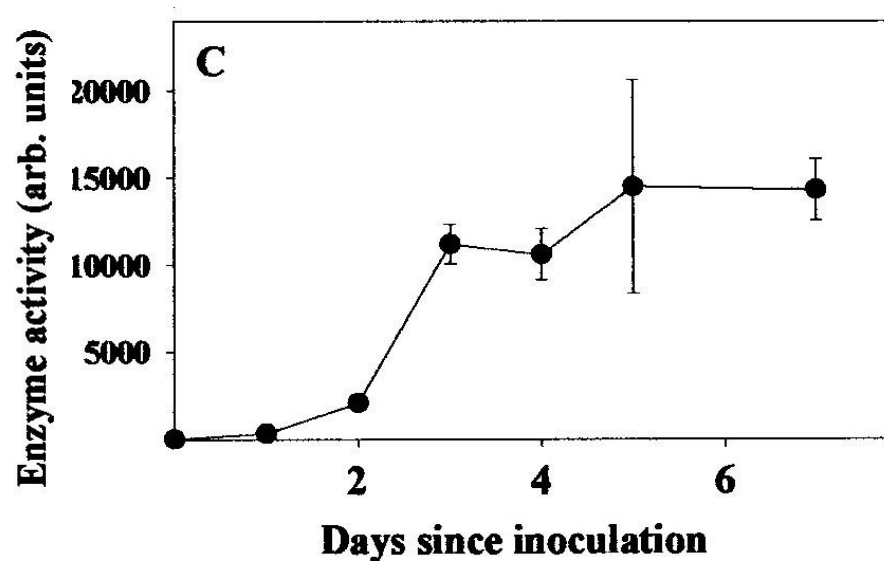
Department of General Microbiology, University of Copenhagen, Copenhagen,¹ and Biocentrum, Technical University of Denmark, Lyngby,² Denmark

Received 4 October 2002/Accepted 17 April 2003

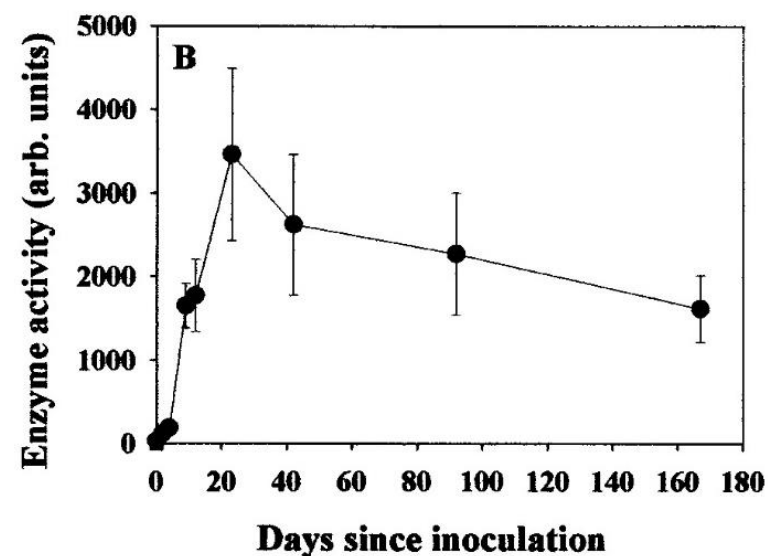
- In the Reeslev study researchers found *Stachybotrys* mold growth on culture media 2–3 days after inoculation and it was detectable on drywall 7 days after inoculation.



Stachy Growth on Culture Media & Drywall



Growth on Culture



Growth on Drywall



What Can We Conclude from Sections 1 & 2



What can we conclude about the insurance industry sponsored studies in Section 1 that find mold takes at least 2–3 weeks to grow?



And what can we conclude about the studies in Section 2 that find the opposite ... that mold, even *Stachybotrys* tertiary mold starts growing fast after a water event?



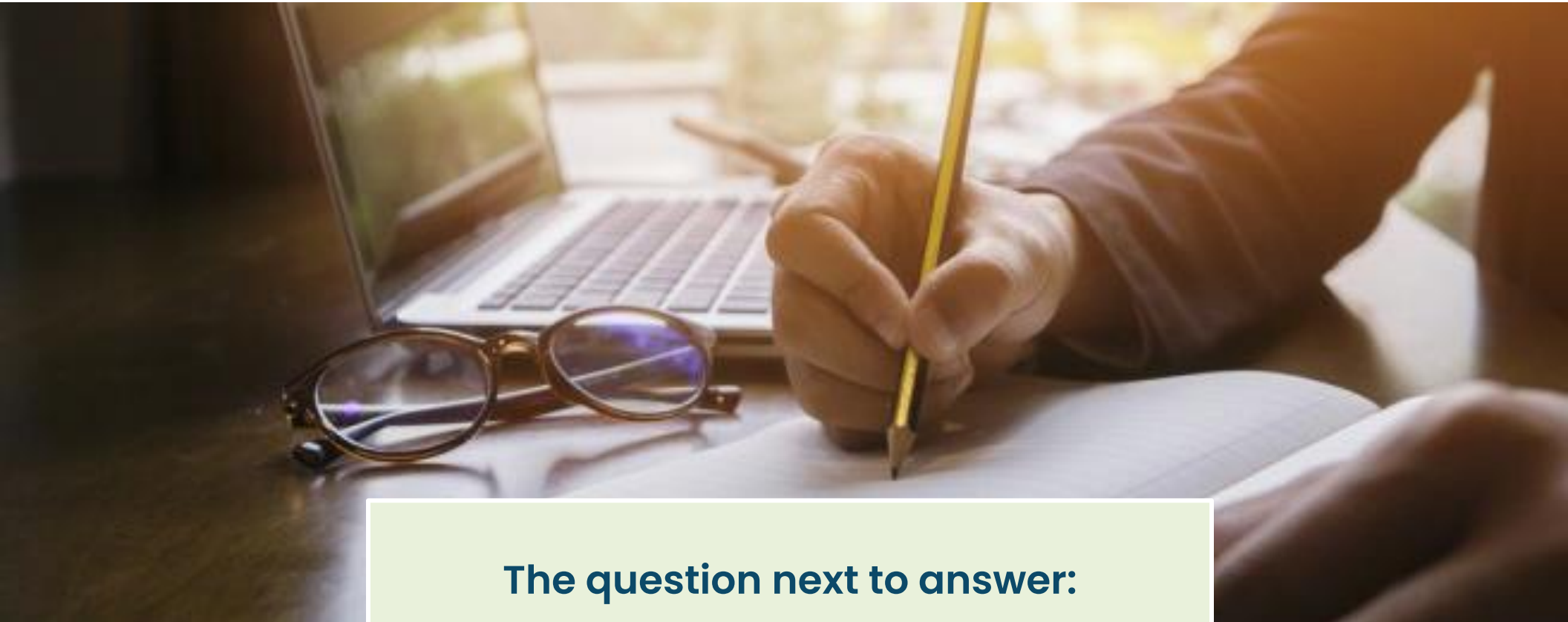
Keep in mind, (under typical South Florida water damage conditions) **in our own studies (Section 4) we also observe mold growth on drywall at 7–8 days** (including Primary, Secondary and Tertiary colonizers.)

No doubt that *Stachy* grows slower than faster growing molds but *Stachybotrys* can start to grow as early as 5–7 days when *Stachy* spores are present.

Conclusions From Section 1 & 2

- Conclusions are that we can toss the Veritox, Driscoll and Berry studies as not applicable to our tropical South Florida environment and/or are flawed junk science.
 - Fast growing species of *Aspergillus* and *Penicillium* can and do start to grow as early as 24-48 hours.
 - *Stachybotrys* can start to grow as early as 5-7 days.
- As per EPA/FEMA: Mold grows fast. Mold does not grow slowly as claimed by insurance industry financed studies.
 - Molds even tertiary molds such as *Stachybotrys* can be found before day 14.

What Are the Conditions for Fast Mold Growth?



The question next to answer:

What are the necessary conditions for mold to grow at these fast rates?

That's the topic of the next section.

The background of the slide is a photograph showing mold growth on various surfaces. On the left, there are vertical wooden studs. In the center and right, there are sections of drywall or plaster that are heavily covered with dark, fuzzy mold. Some areas show pinkish or reddish mold growth, particularly on the left side. The overall scene is one of significant mold infestation in a building's interior.

SECTION 3

**What conditions are needed
for fast mold growth?**

What Are the Conditions for Fast Mold Growth?



Under what conditions can molds grow at these fast rates?
The answer: Under South Florida conditions ... pretty much all year round!

Mold Needs FOUR Things to Start to Grow



Water/ Moisture to start germination



Warm or hot temperature for fast growth



Food source — Starch such as the cellulose on the paper face of drywall or the glue that attaches the drywall paper to the gypsum core.



Mold Spores



Conditions Ideal in S. Florida

- Conditions in South Florida are ideal for mold growth all year round.
 - We do have water and/or water damage all year round.
 - Temperature pretty much always warm or hot with very few exceptions.
 - And of course, there is always plenty of food in water damaged homes (drywall, cabinets, wood baseboards etc).

- But what about mold spores? Those are certainly needed for germination. Are they always around?
- Yes, there are.

Mold Spores ALWAYS in our S. Florida Outdoor Air



No doubt in the northern U.S. during a snow storm there are few to perhaps no mold spores in the air, but in South Florida mold is found in the air and in house dust all year round.

Fungi Identified	Outdoor data			Typical Outdoor Data by Date Month: February (n=1980)			
	Cfu/m3	Very low	Low	Med	High	Very high	Freq %
Acrmonium		7	8	12	18	25	2
Alternaria	12	7	7	12	24	35	14
Aspergillus (total)	47	7	7	14	35	60	30
Aspergillus niger	24	5	7	12	24	35	13
Aspergillus sydowii	24	6	7	12	32	51	2
Aspergillus ustus							<1
Aspergillus versicolor		7	7	12	25	58	8
Aureobasidium	12	7	7	12	24	35	14
Basidiomycetes		8	14	59	160	370	8
Chaetomium		7	7	12	20	35	2
Cladosporium	160	12	24	120	440	860	80
Curvularia						-	<1
Epicoccum	12	7	7	13	28	48	12
Fungi w/o identifying traits (total)**	24	7	12	21	47	71	62
Arthrospores-former		12	20	52	130	250	4
Non-sporulating fungi	24	7	12	21	36	67	60
Nigrospora						-	<1
Paecilomyces		4	7	12	22	35	5
Penicillium	120	10	12	35	100	180	67
Rhizopus		5	7	11	12	18	3
Strachybotrys chartarum						-	<1
Torula						-	<1
Ulocladium	12	7	7	12	18	24	3
Yeasts	24	7	12	23	47	79	38
TOTAL CFU/m3	420						

Mold Spores ALWAYS in the Air



We find Aspergillus, Penicillium and Cladosporium in the outside air 365 days a year in South Florida except during very heavy rains.

Mold spores are always present both inside and outside homes.

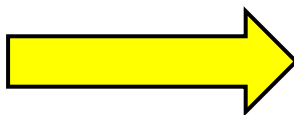
There is almost always mold spores spewing out of AC ducting which unless the home is brand new, will always have some amount of mold growth inside.



Mold Spores in the Air But No Stachybotrys

- We note that there is almost no Stachy found in the outdoor air.
- But Stachy growth on drywall are extremely common.
- Seems to make no sense.

(Stachy is pronounced Stacky)



Fungi Identified	Outdoor data			Typical Outdoor Data by Date Month: February (n=1980)			
	Cfu/m3	Very low	Low	Med	High	Very high	Freq %
Acrmonium		7	8	12	18	25	2
Alternaria	12	7	7	12	24	35	14
Aspergillus (total)	47	7	7	14	35	60	30
Aspergillus niger	24	5	7	12	24	35	13
Aspergillus sydowii	24	6	7	12	32	51	2
Aspergillus ustus							<1
Aspergillus versicolor		7	7	12	25	58	8
Aureobasidium	12	7	7	12	24	35	14
Basidiomycetes		8	14	59	160	370	8
Chaetomium		7	7	12	20	35	2
Cladosporium	160	12	24	120	440	860	80
Curvularia						-	<1
Epicoccum	12	7	7	13	28	48	12
Fungi w/o identifying traits (total)	24	7	12	21	47	71	62
Arthrospores		12	20	52	130	250	4
Non-sporulating fungi	24	7	12	21	36	67	60
Nigrospora						-	<1
Paecilomyces		4	7	12	22	35	5
Penicillium	120	10	12	35	100	180	67
Rhizopus		5	7	11	12	18	3
Stachybotrys chartarum						-	<1
Torula						-	<1
Ulocladium	12	7	7	12	18	24	3
Yeasts	24	7	12	23	47	79	38
TOTAL CFU/m3	420						

Stachybotrys Ubiquitous in S FLA

Stachybotrys is ubiquitous in Florida (and most parts of the country) but not in the air. It is found on:



Soil &
decaying plant
substrates



Decomposing
cellulose



Leaf litter and



Seeds

Stachybotrys Ubiquitous in S FLA Soils

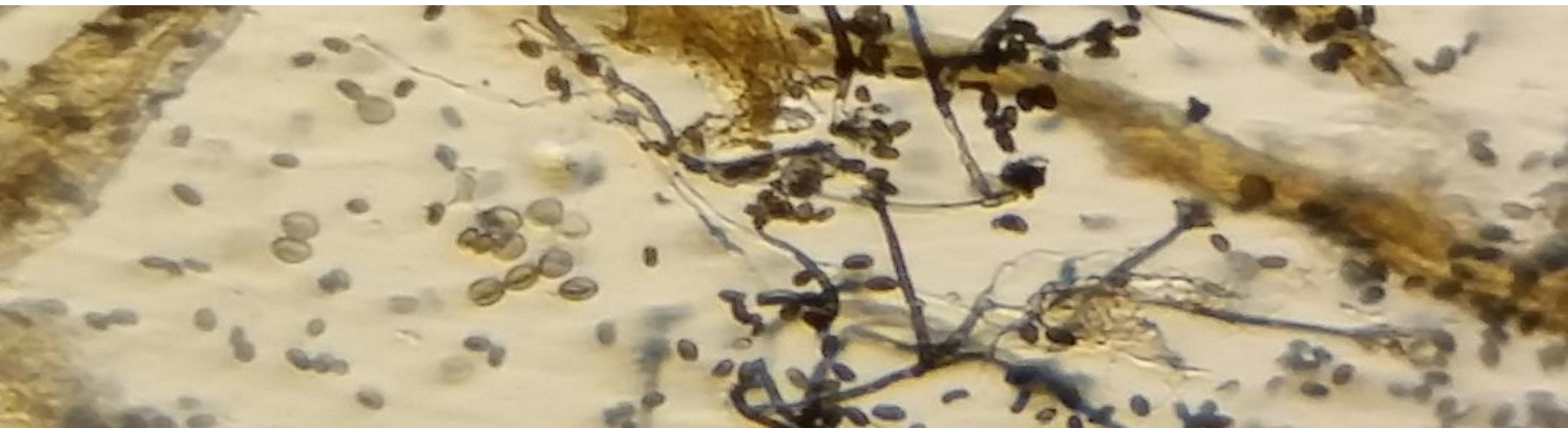
Stachybotrys is ubiquitous in South FLA soils. It is tracked in by people, pets and by insects living in walls.

Stachybotrys spores are always around just not commonly found in the air because they are very heavy and settle out quickly when airborne.



What Conditions Support Fast Stachy Growth?

- Under what conditions does Stachybotrys quickly grow?
- Under typical South Florida conditions ... where there's lots of wet food (drywall, cabinets etc) and warm or hot weather pretty much all year round.
- **Mold spores must be present for mold to start to grow but they may come from either the air; and/or dusty floors; and/or flood water.**



Stachy Mold Spores Always Present

In homes (unlike in laboratory conditions) Stachy spores are always found:



Entering from the outside through a door or window and accumulating in house dust.



On floors dragged in on shoes and pet paws.



On clothes that were worn outside.



In wall cavities because walls cavities are connected to vented attics (never sealed air tight).



In the dirt under cabinets and on carpet and pad.

There is Always Stachy

- There are always Stachy spores inside of homes (to a lesser degree in the air but on floors, in wall cavities, under cabinets).
- When there is a water event (clean or not) there will be Stachybotrys spores present in the flood water that will find their way to the bottom of:
 - Wet drywall ... and then start to germinate.
 - Wet cabinet bottoms ... and then start to germinate.



Our Own Super Clean Control Experiment

- Clean (tap) water with (No Stachy spores in the water. No molds spores at all.)
- Clean piece of new 24x24 USG brand drywall from Home Depot.
- Clean painter's tray.
- Very clean home (in terms of mold spores).



- Merv 11 air filters with AC FAN=ON. Air being filtered 24x7.
- Wood floors steam mopped once a week.
- No carpets downstairs.
- Air conditioned home with temperature at about 73 degrees.

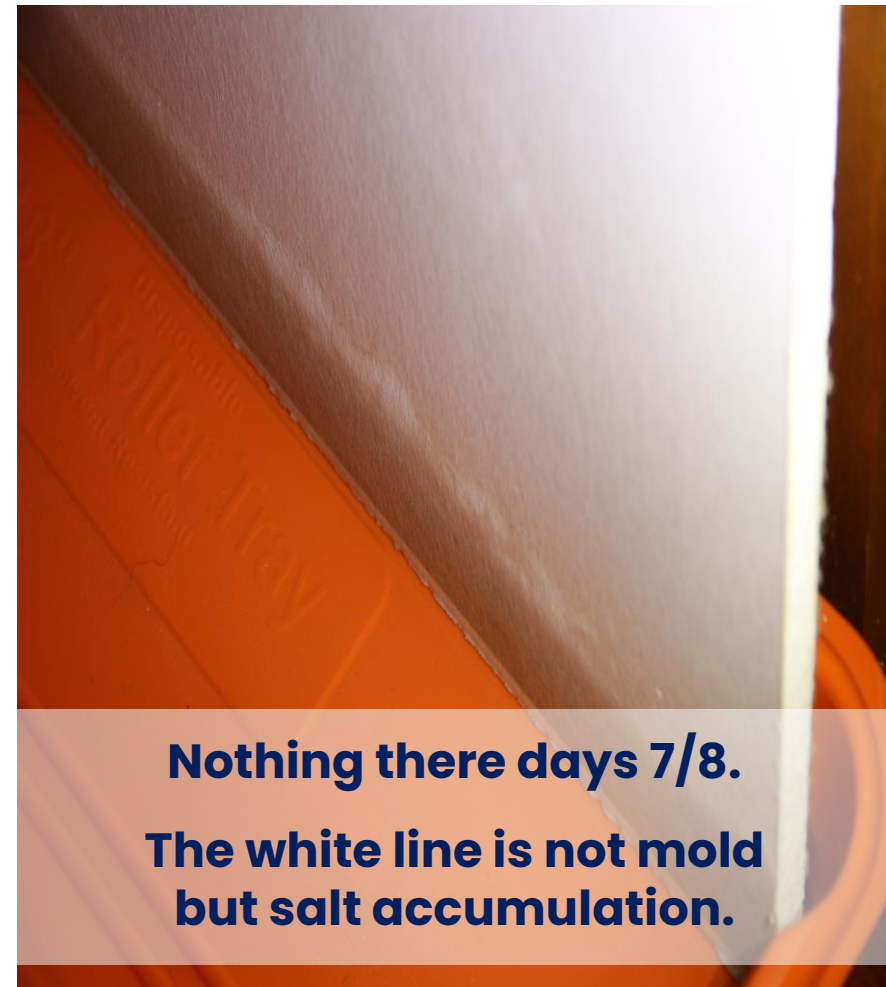
Our Own Super Clean Control Experiment



Plenty of water; food source available (wet drywall); temperature acceptable for mold growth – but if there are no mold spores in the air or in flood water, mold will not start to grow.

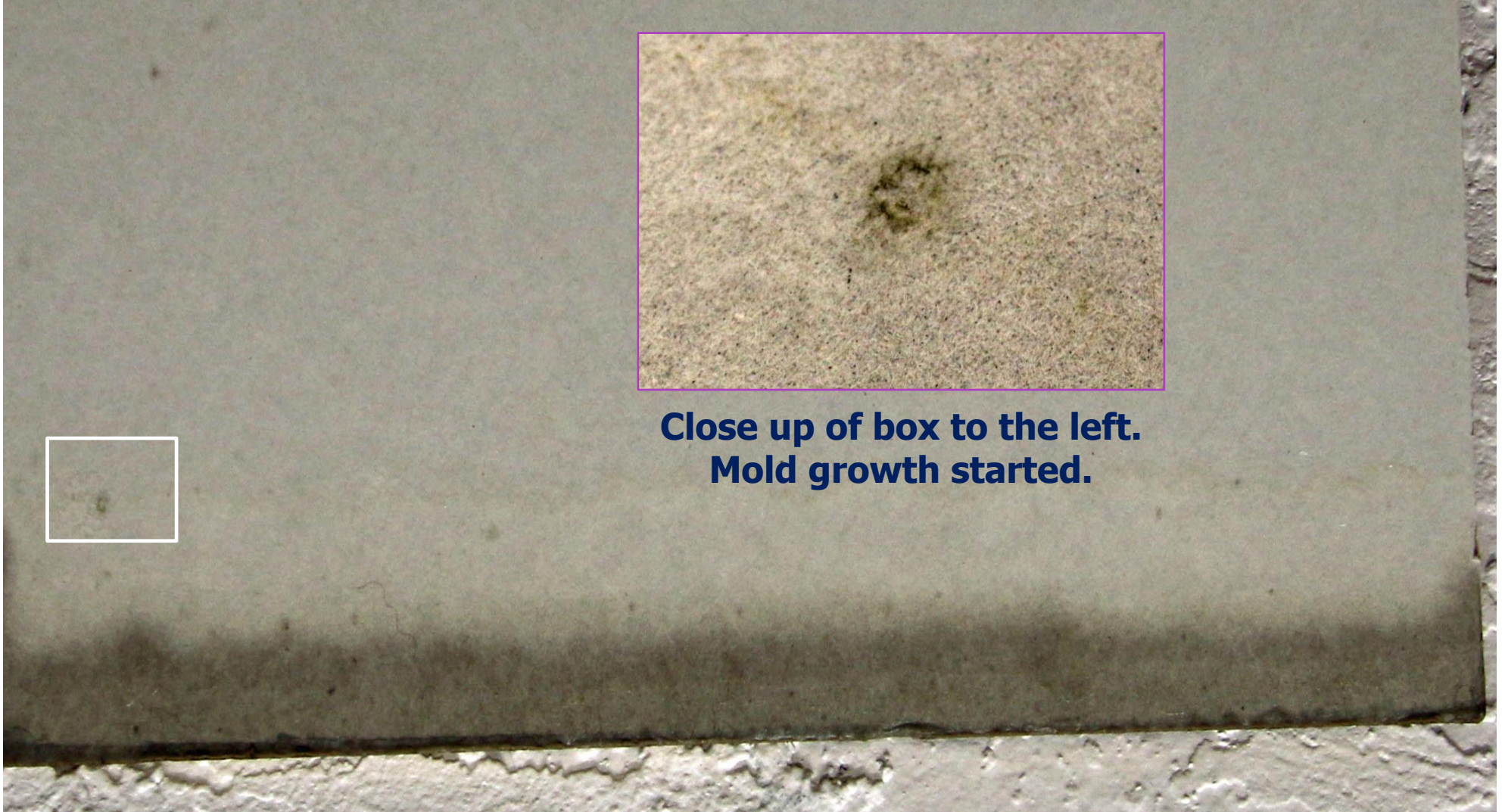


But no homes even super clean homes have no mold spores in the air. They come in when you walk thru the front door.



**Nothing there days 7/8.
The white line is not mold
but salt accumulation.**

Day 14 Mold Growth Starts to Become Detectable



Super Clean Control Experiment



- Day 14 Mold Growth Detectable
- Super clean air-filtered air does not mean no mold at 14 days.
- It only means there are less mold spores and mold growth will be less heavy. But there will be mold growth by day 14 because there is always some mold in the air no matter how clean the home.
- And ... mold germinates quickly on wet drywall.

Our Own Super Clean Control Experiment



In this experiment there is No Stachy growth since there is no flood/ ground water, and mold germination is only from mold spores floating in the air landing on wet drywall.



Recall that we typically have almost no Stachybotrys spores in the air in S Florida.



The large heavy Stachy spores settle out of the air rapidly compared to the much lighter and more aerodynamic spores such as Aspergillus and Penicillium that can stay airborne for days or weeks.

Notes

- Stachybotrys does not grow on plaster walls. Its food of choice is cellulose such as the paper face of drywall.
- Stachybotrys spores are wicked up from flood waters and growth starts at the bottom of walls (unlike airborne mold spores that colonize uniformly across the entire surface of wet drywall paper).
- If drywall is hung with a gap at the floor, Stachy growth will be reduced or eliminated.



Section Summary

Stachy Growth

- For Stachy to grow, the spores do not generally come from the air because these spores are big and heavy and settle out of the air rather quickly.
- Stachy comes from (what started as clean) flood water that has been contaminated with ubiquitous Stachy spores in the settled dust of homes (floors, wall cavities, under cabinets etc.)
- If you study mold growth with clean water and clean surfaces you will not find Stachy.
- The experiments set up by Insurance “experts” use clean water and are performed in clean lab environment so they only find mold growth that is from airborne mold spores and not dirty water/floors.



Section Summary

Stachy Growth

- And the Carrier funded so-called Forensic engineers call these Carrier funded experiments “representative of typical indoor environment after a water event.”
- I wouldn't even call their experiments Junk Science.
- More like Fake Science yielding Fake Conclusions.



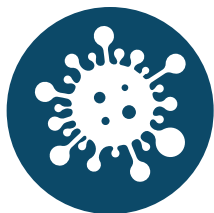
SECTION 4

**Our South Florida studies
show heavy mold by
Day 14.**

Our Experiments

- Besides the earlier discussed experiment in a super clean home with clean water and clean surfaces, we performed a few experiments in typical home environments.
- Anyone can easily reproduce these simple experiments and will get similar results.
- We bought a piece of 24x24 inch USG brand drywall from Home Depot.
- We dusted the bottom of the drywall with some existing mold.
- For water source we used canal water (not clean bottled or tap water) to simulate typical dirty (nutrient and mold spore rich) flood water.

Mold Inoculation



The bottom edge of the drywall was seeded with mold spores from some moldy drywall.



Inoculated mold included spores from Chaetomium along with Pen/Asp and Stachybotrys.

ANALYSIS METHOD	Spore trap analysis		
LOCATION	INSIDE BAG		
COC/LINE #	918016-1		
SAMPLE TYPE & VOLUME	AIR-O-CELL 100-75L		
SERIAL NUMBER	22310267		
COLLECTION DATE	Jab 21, 2016		
ANALYSIS DATE	Jan 25, 2016		
CONCLUSION	ELEVATED		
IDENTIFICATION	Raw Count	Spores per m3	Percent of Total
Chaetomium	8	110	2
Penicillium/ Aspergillus	173	2,300	39
Stachybotrys	261	3,500	59
Total SPORES	442	5,910	100
MINIMUM DETECTION LIMIT	1	13	
BACK GROUND DEBRIS	Light		
Cellulose Fiber	1	13	
Insect Fragments	1	13	
Plant Fragments	4	53	
OBSERVATIONS & COMMENTS			

Experiment Set Up Cont'



- The study was performed in our air conditioned garage work room the last week of January 2017 – the first week of February.
- Mild weather conditions similar to but perhaps a bit cooler than an air conditioned home.
- After a few days the drywall was wet about 10 inches high.
- This was confirmed by both a moisture meter as well as by FLIR infrared imaging.

After 7 Days



After 7 days mold spots were forming.



These formed all over the wet area from the bottom of the drywall to about 9-10 inches high.



At this point the mold was embedded in the drywall paper and did not come off with lift tape.



After 8 days mold was clearly visible on the drywall surface.



By 14 days there was very heavy mold.

At 14 Days Heavy Mold. Cool Temperature.

Plenty of mold growth at day 14.



DNA Testing at 8 Days

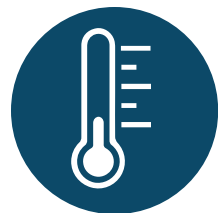
- Found heavy *Aspergillus sydowii*; *Aspergillus ustus*; *Aspergillus versicolor*; *Cladosporium cladosporioides*; *Penicillium chrysogenum* at the top & middle of the wet area (about 8-10 inches.) At **8 days**.
- And heavy *Stachybotrys* and some *Aspergillus* at the bottom of the drywall. At **8 days**.



Repeated Study With No Seeding



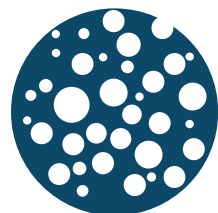
We repeated the study but this time with no seeding (no mold inoculation at the bottom of the drywall.)



Temperature was cool. Low 70's during the day and 60's at night.



Again we used canal water as the water source (not clean bottled water).



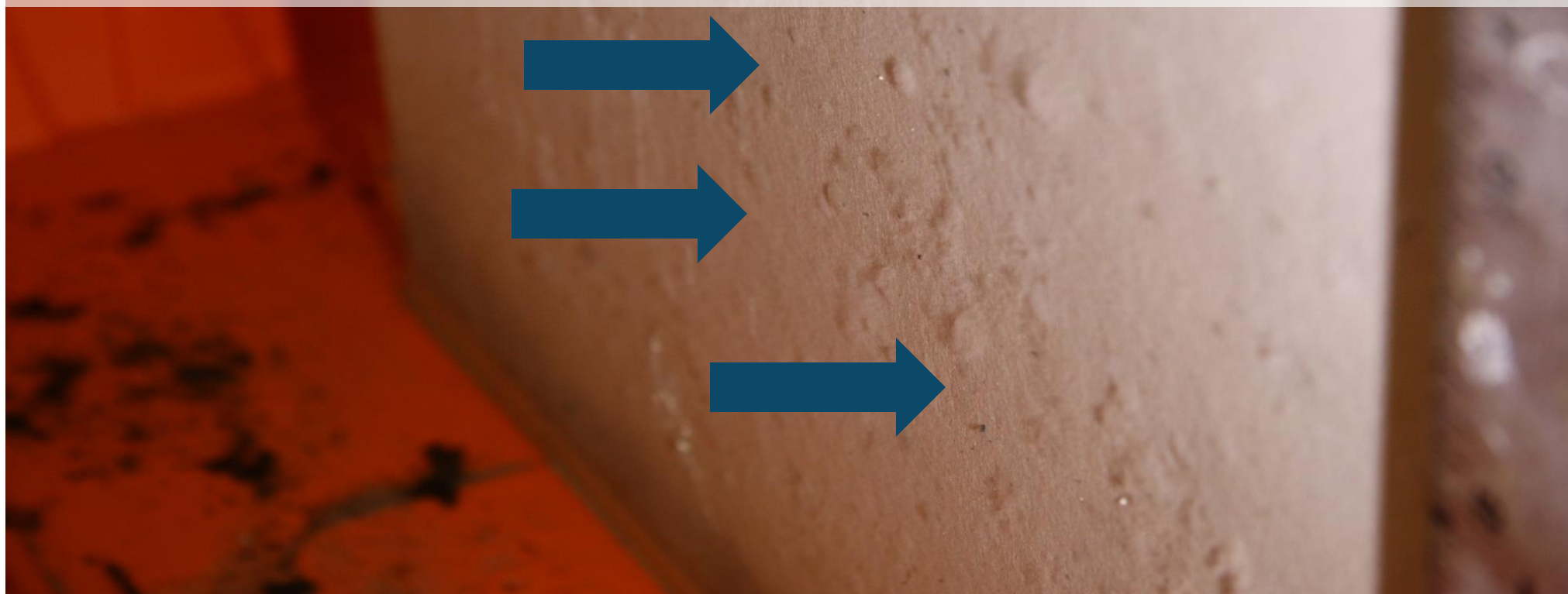
Drywall was wet to about 9-10 inches high after a few days.



Results were ...

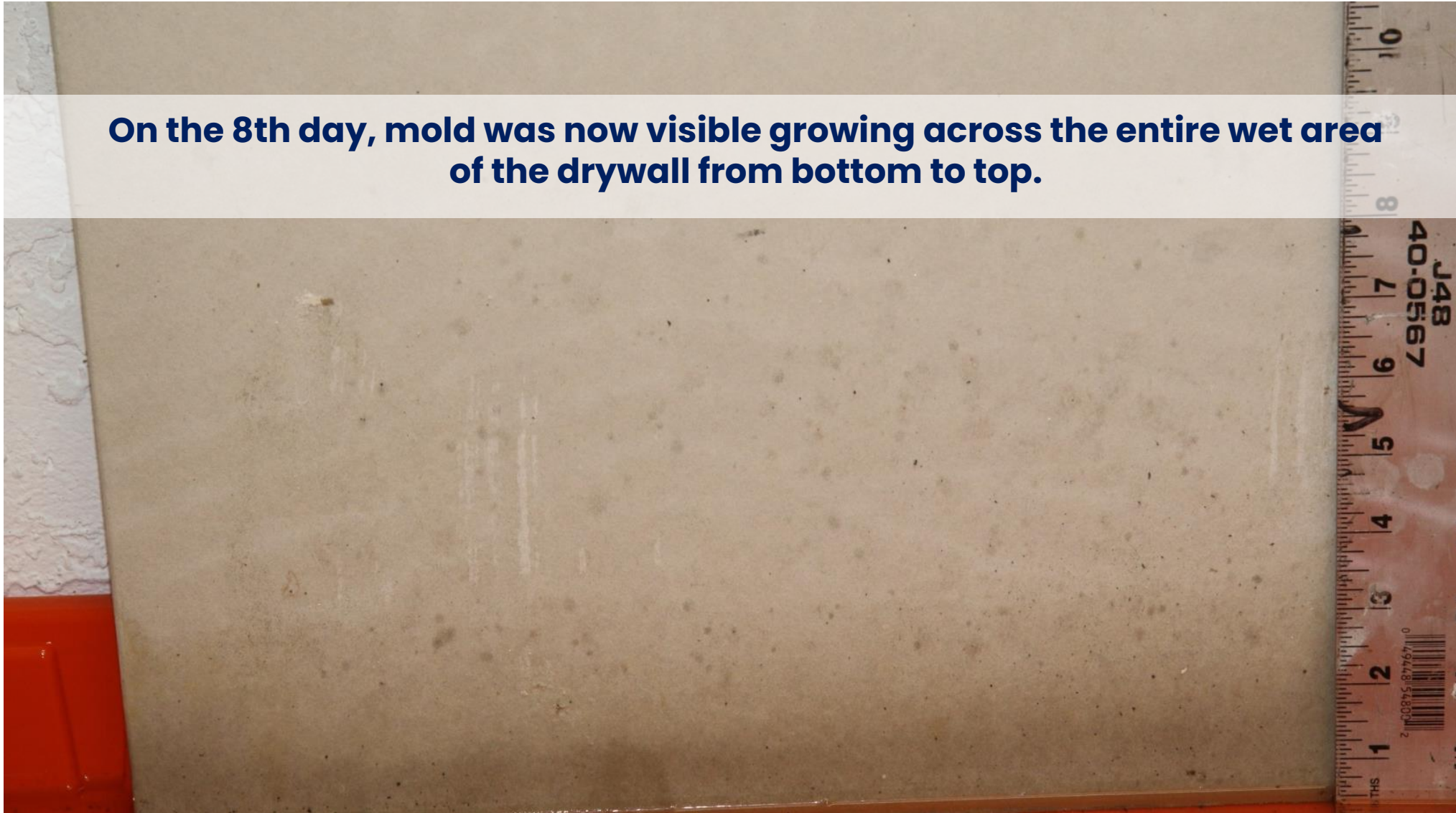
No Seeding. 7th Day

On the 7th day, mold growing from under the drywall paper over the entire wet area was clearly visible if you look at the drywall at an angle with a flashlight. Nothing visible if you view straight on.



No Seeding. 8th Day.

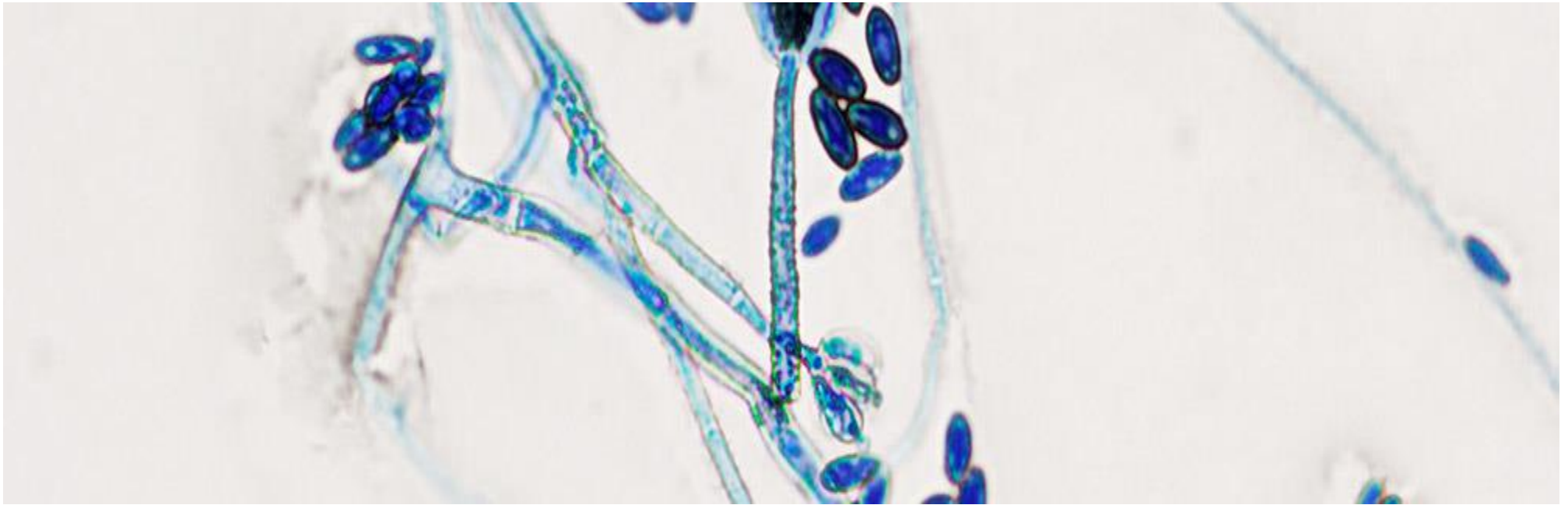
On the 8th day, mold was now visible growing across the entire wet area of the drywall from bottom to top.



Study Growth at Day 8

- Results for the study with no seeding were similar to the first study where we seeded the bottom of the drywall with mold spores including *Stachybotrys*.
- Major mold growth observed at day 8.





No Seeding. Growth at Day 8



In terms of the rate of mold growth, results for the study with no seeding were similar to the study where we seeded the bottom of the drywall with mold spores including *Stachybotrys*.



However seeding the bottom of the drywall with *Stachy* resulted in much heavier *Stachybotrys* growth.

Conclusions Section 4

Stachy Grows from the Bottom



We can see that Stachy grows from the bottom up because Stachy spores are found in flood waters and not the indoor air.



Other molds are seeded from the indoor air and grow to some degree uniformly across the moistened drywall (typically about 10 inches high in these studies).



Both grow fast. With substantial colonization well before 14 days.

A photograph of a wall and window frame heavily infested with mold. The mold appears as dark, fuzzy patches on the light-colored wall and along the edges of the window frame. A semi-transparent blue horizontal band is overlaid across the middle of the image, containing the text 'Wrap Up' in white.

Wrap Up

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Expert Testimony Title VII

Title VII

EVIDENCE

Chapter 90

EVIDENCE CODE

[View Entire Chapter](#)

90.702 Testimony by experts.—If scientific, technical, or other specialized knowledge will assist the trier of fact in understanding the evidence or in determining a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify about it in the form of an opinion or otherwise, if:



The testimony is based upon sufficient facts or data;



The testimony is the product of reliable principles and methods; and



The witness has applied the principles and methods reliably to the facts of the case

History.— s. 1, ch. 76-237; s. 1, ch. 77-77; s. 22, ch. 78-361; s. 1, ch. 78-379; s. 1, ch. 2013-107.

Challenge The So-Called Experts

- Most of the so-called Experts that the insurance carriers bring out to deny claims have very little technical knowledge of the subject matter... even if they have resumes 3 feet long!
- Their expertise is in denying claims by confusing readers of their reports with bogus references; including charts that look good but have no meaning; etc.
- They never rely on studies published in scientific journals that are peer-reviewed by independent, external experts.
- They rely only on “studies” performed by Insurance Defense Experts and then published online in non Peer-Reviewed industry journals.



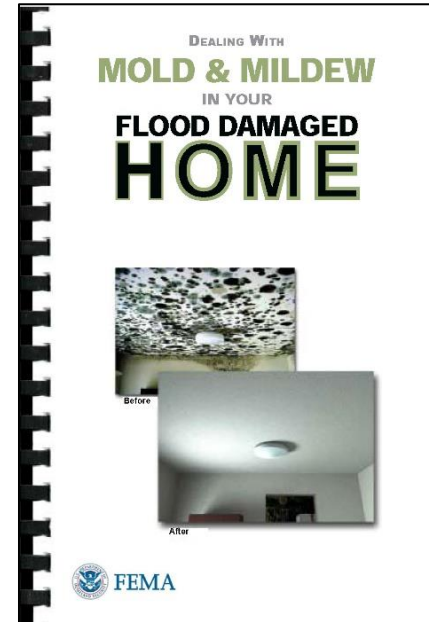
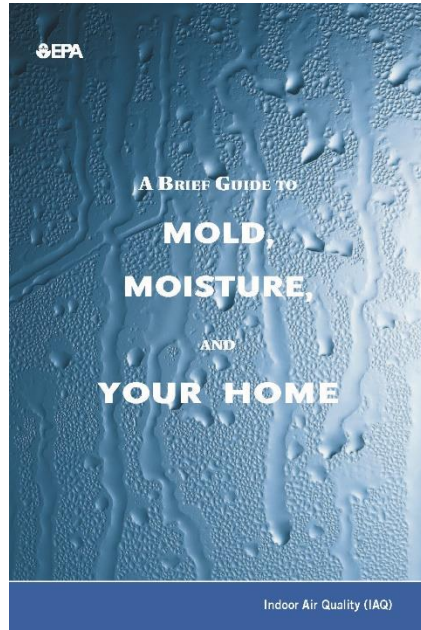


Challenge The So-Called Experts

Challenge them on the details per FLA Expert Law:

- They need to prove that their methods are reliable and generally accepted.
- If they are referring to their own (Carrier paid for) studies, has anyone repeated them? Are they published? Peer Reviewed?
- Are the referenced studies under the same conditions? Temperature, humidity, wall cavity?
- Drill down and have them explain fine points in their reports. Reports are often written by someone in the Expert's employ and the Expert cannot explain.

Federal Guidance Disregarded



- Carrier's so-called Forensic Experts claim that mold growth is slow.
 - Therefore, mold growth indicates long term continuous damage and failure to mitigate. Deny claim.
- Carrier's so-called Forensic Experts contradict EPA & FEMA guidance that says mold starts to grow in only a few days.
- Absurd Carrier expert claims should be challenged.
- **Because mold grows fast, once there is any mold growth there is permanent damage that triggers coverage.**



About Us

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About Us

- We are State Licensed Mold & Building Contractors with a focus on Mold Remediation and Rebuilds ... having performed over 2000 mold remediation jobs in the past 14 years.
- We have received Angie's List Super Service Awards for the past five years for excellent quality and highly cost-effective work in the tri-county area.
- Dr. Rosen, Certified Mold Free Corp President has been approved by the Florida Mold Services Division to provide mold and water damage training (both CE and Initial licensing) as well as provide the State licensing examination for Mold Assessors and Mold Remediators (the only Florida remediation firm to do so.)

Angie's list

Florida Department of
Business &
Professional
Regulation

Approved
Examination

We Provide Free Training

- Through our wholly owned affiliate National Association of Environmentally Responsible Mold Contractors (NAERMC) we provide as a public service — absolutely free of charge & State of Florida approved — both mold and water damage training on our web site:



www.Free-Mold-Training.org



NAERMC

National Association of Environmentally
Responsible Mold Contractors