

An Other Defoliator: Douglas-fir Tussock Moth




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The Douglas-fir Tussock Moth (*Orgyia pseudotsugata*)

- The DFTM is native to western North America;
- Every nine yrs. populations explode somewhere within their host range;
- One might even say, "...outbreaks are beneficial to the ecosystem as tree mortality and insect frass contribute to soil fertility and vigor to the new stages of succession." Interesting idea of Mattson and Addy 1975!

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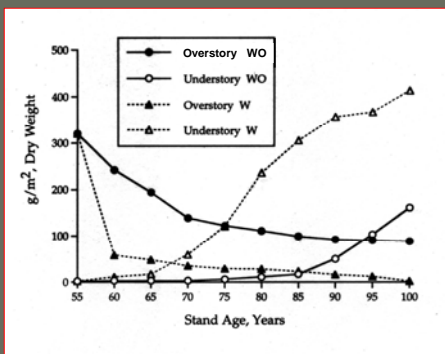
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Effects of defoliation vs. no-defoliation on forest biomass




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- Principal host species of the DFTM are Douglas-fir & firs.
- DFTM belongs to another notorious family of defoliators: the Lymantriidae.
- Notorious lymantriids include the gypsy moth and the nun moth.
- Lymantriids are known as the “hairy moths” because they are cloaked in a thick mat of hair.




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Chileans are super concerned that the nun moth might come into the country

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Just imagine what would happen to these beautiful hardwood forests of Chile if those bad lymantriids were to take possession.



“Adios bosques queridos”

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Larvae of lymantriids are also hairy:



Plain-old hairy lymantriid

A tussock moth



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Remember the WSBW? What do WSBW larvae feed on?

New growth!



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The Douglas-fir tussock moth, *Orgyia pseudotsugata*

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There are three major points to know about the DFTM:



1. Larvae feed on both young and old foliage
2. Outbreaks occur every 9yrs (somewhere in the West)
3. Outbreaks last about 4yrs

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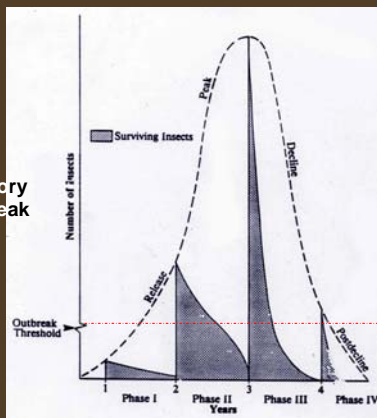
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Outbreak trajectory of a DFTM outbreak



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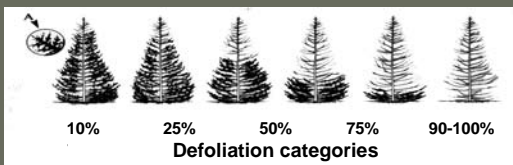
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During the second yr of an outbreak you get this kind of defoliation, i.e. barely to ~100%



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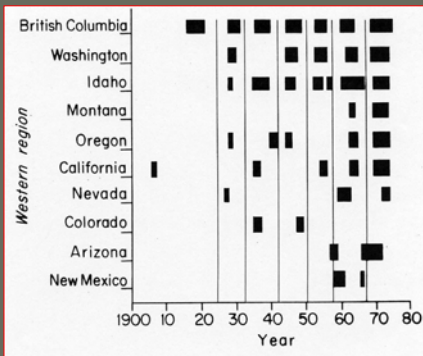
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Outbreaks occur every 9yrs. somewhere in the West



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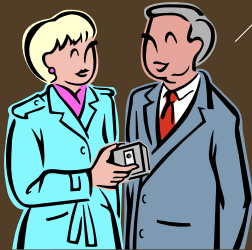
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Let me briefly review the DFTM life cycle for you.



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Pupa



Late summer adults emerge from pupae.

Male



Female



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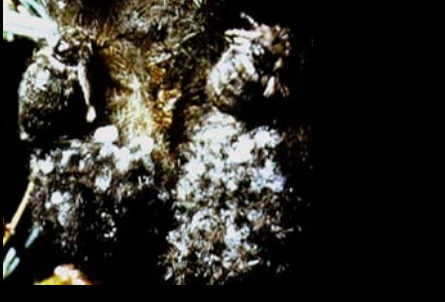
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After calling in males with a sex pheromone, each gravid female lays about 300 eggs within a hairy egg mass (eggs covered with hairs from their bodies).



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The egg masses over winter



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Next spring the larvae emerge and climb to a high point where they balloon.



Just do it!



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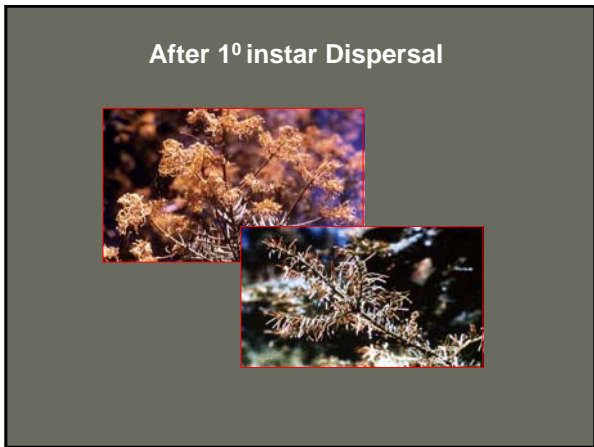
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If it's the 3<sup>rd</sup> yr. of an outbreak the defoliation is quite severe



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There's a Forest Service entomologist, named Boyd Wickman (Ret.), who always said, "don't spray the DFTM, the defoliation is not that bad."



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The forests recover



Yr-3



Yr-4

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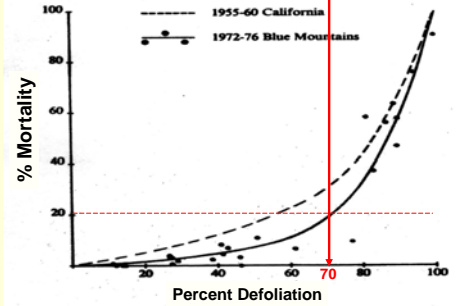
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Sure, there is mortality  
but only in the highest  
defoliation classes.




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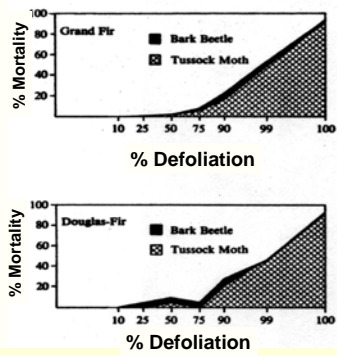
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You can prevent DFTM outbreaks by:

- Thinning out the late successional species  
Prescribed burns
- Favor ponderosa pine where possible
- Maintain stand vigor across the landscape.
- You can also do nothing.

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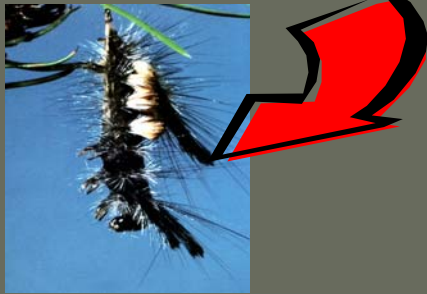
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Doing nothing works because at or about the 4<sup>th</sup> Yr there is a virus epizootic ! Wipe-out time!




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Nuclear polyhedrosis virus:

Proteinaceous coat forms the polyhedron

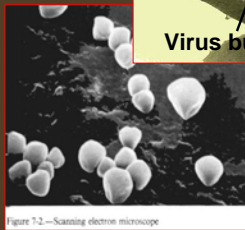


Figure 7.2 - Scanning electron microscope

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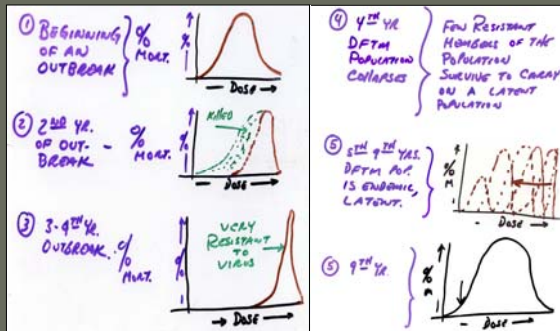
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Possible scenario of the 9<sup>th</sup> yr phenomenon




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Applied control

The DFTM nuclear polyhedrosis virus is available for direct treatment of heavy defoliation where mortality of Douglas-fir and true firs are threatened -- a heavy-use campground area.



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Defoliators to be continued



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