

Health Hazards Associated with Wood Dust and Fungi from Mulch Producing Facilities

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Mulch, Fungi and Wood Dust

Peer Reviewed Studies

- While mulch is generally considered “safe”, the context is typically residential application, not piles of mulch covering acres 20 ft. high being churned daily.

Here are but five studies that begin to touch on the potential consequences.

- Fulminant Mulch Pneumonitis: An Emergency Presentation of Chronic Granulomatous Disease
 - Infectious Diseases Society of America
- Fungal spores: hazardous to health
 - US National Libratory of Medicine, NIH
- Adverse Human Health Effects Associated with Molds in the Indoor Environment
 - American College of Occupational and Environmental Medicine
- Pulmonary responses after wood chip mulch exposure.
 - US National Libratory of Medicine, NIH
- Binding of *Aspergillus fumigatus* spores to lung epithelial cells and basement membrane proteins: relevance to the asthmatic lung.
 - I.M. Bromley and K. Donaldson

Fungal Spores: Hazardous to Health

- “Fungi have long been known to affect human well being in various ways, including disease of essential crop plants, decay of stored foods with possible concomitant production of mycotoxins, superficial and systemic infection of human tissues, and disease associated with immune stimulation such as hypersensitivity pneumonitis and toxic pneumonitis. The spores of a large number of important fungi are less than 5 micron aerodynamic diameter, and therefore are able to enter the lungs. They also may contain significant amounts of mycotoxins. Diseases associated with inhalation of fungal spores include toxic pneumonitis, hypersensitivity pneumonitis, tremors, chronic fatigue syndrome, kidney failure, and cancer.”

W.G. Sorenson – US Library of Medicine, NIH

Wood Dust: Hazardous to Health

- “Cancers have been associated with wood dust exposure. The National Institute for Occupational Safety and Health (NIOSH) considers both hardwood and softwood dust to be potentially carcinogenic to humans. The three types of cancers associated with wood dust exposure are nasal and sinus cavity cancer, lung and other cancers, and Hodgkin's disease. The wood and cancer relationship was studied by Milham (1974), who conducted a mortality study involving the AFL-CIO United Brotherhood of Carpenters and Joiners of America. This study supports the hypothesis that wood contains carcinogenic agents. The cancer mortality patterns found were:
 - Excess lung cancer in acoustical tile applicators and insulators.
 - Excess gastrointestinal cancer in pile drivers.
 - Excess leukemia lymphoma group cancers in millwrights, mill workers, and lumber and sawmill workers.
 - Excess lung and stomach cancer in construction workers with the greater excesses found in workers in major urban areas.
- Hodgkin's disease has also been associated with wood dust.”

Wood Dust Exposure Hazards AEX-595.1-2006

Thomas L. Bean, in collaboration with Timothy W. Butcher and Timothy Lawrence
Ohio State University

Wood Dust and Fungi Risk Mitigation

- None
 - Grinding wood and frequent churning of mulch piles ejects dust and spores into the air.
 - Fungal Spores can't be seen with the naked eye [< 5 microns] and are airborne to greater distances than mulch dust. Mulch processing requires the use of water to reduce mulch dust both as an irritant and to mitigate against mulch fire risk.
 - Moisture stimulates the growth of mold.
 - Fungi/fungal spores are dormant when dried.
 - It is inevitable that you will have both, mulch dust AND fungal spores airborne, spread by the prevailing winds.

Howard County Test Case

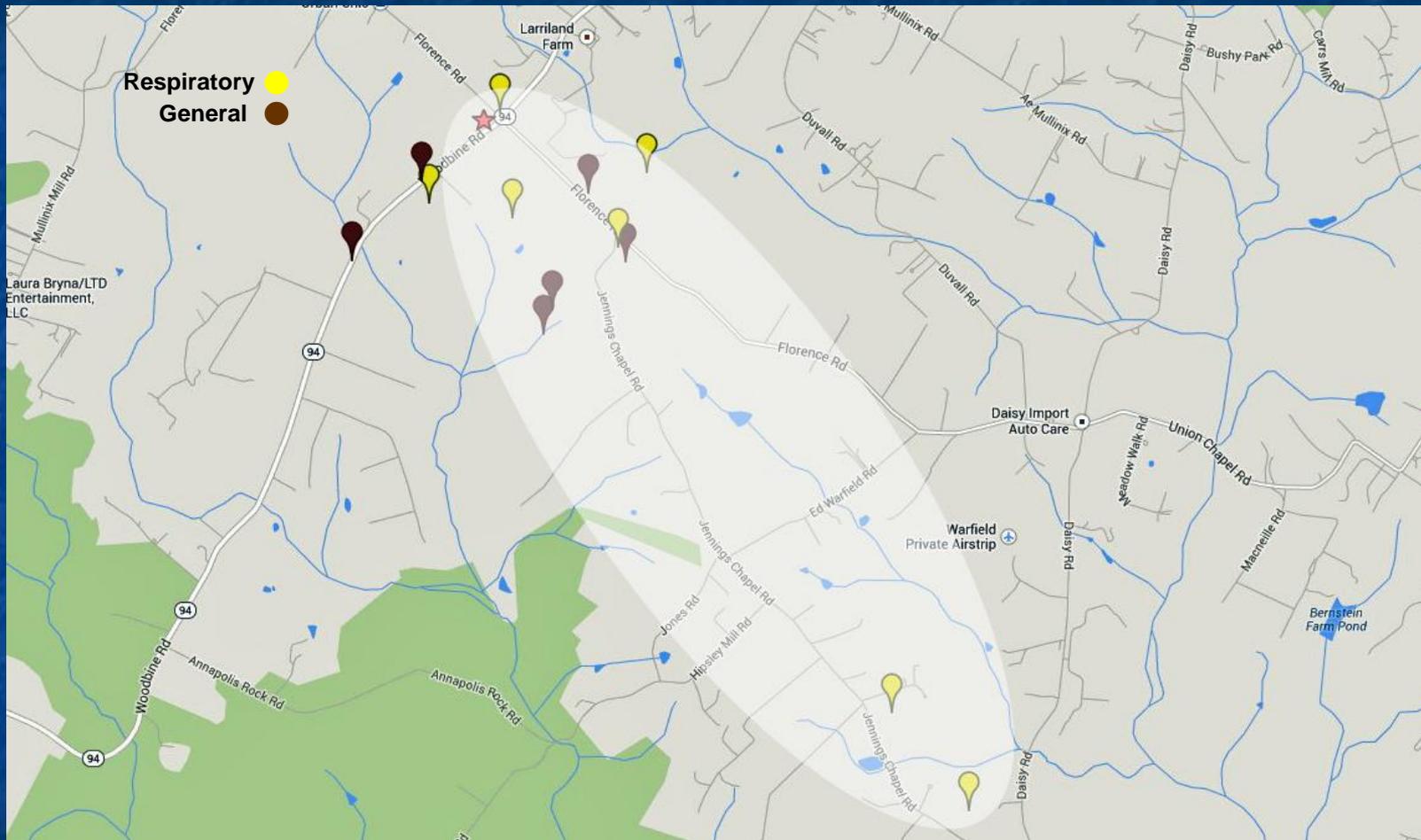
Sponsored by Oak Ridge Farms, LLC

- Oak Ridge Farms, LLC has inadvertently provided Howard County with a test case of the possible consequences of mulching and composting facility on Agricultural Preservation Properties.
- The residents of Woodbine, including farmers and livestock, have been the unwitting subjects in this test case.
- We can learn a lesson from this experiment on Woodbine Residents.
- Observation, sample collection and analysis of the Woodbine experience is necessary.

Requests to DPZ for Zoning Inspections Oak Ridge Farms

- Residents of Woodbine made 17 requests to DPZ [Nov-Dec 2013]
- 9 Requests explicitly stated respiratory related issues
 - All with health issues were age 51 and older
 - 2 residents under care at Johns Hopkins were tested and found to have wood particulate matter in their respiratory system
 - Distance between the Oak Ridge facility and most distant health issue was 3.1 miles [airborne fungi spores can travel longer distances than wood dust]
- 8 Requests were of a general nature
 - Traffic
 - Pollution & contaminants
 - Decline in air quality
 - Odor
 - Noise, e.g., “louder than a combine”
 - Residents can feel the vibrations of the grinding equipment
 - Occurring 6 or 7 days a week

Inspection Requests - Clustering



Prevailing North West Winds Affecting Residents to 3.1 Miles
Florence and Jennings Chapel Roads may provide “corridors” for wind

Summary – Health Hazards

- Fungal Spores and wood dust from mulch are known health risks to humans.
- Hazards of mycotoxins and mycotoxigenic fungi are well documented in peer reviewed studies within the US and Internationally.
- Wood dust has been long established as a carcinogen.
- There are no mitigation strategies.

Summary - Woodbine Test

- Woodbine Residents have been unwitting participants in a “test” resulting from operations by Oak Ridge Farms, LLC.
- In a relatively short period of time, residents and livestock are showing symptoms commonly associated with fungal spore contamination and wood dust inhalation.
- The clustering of those affected is consistent with prevailing winds.
- The affected persons in Woodbine are more than 3 miles away from the Oak Ridge Farms, LLC facility.
- Horses and livestock are showing respiratory distress.