

# Dynamics of Machine Fluid Injury on a Bermudagrass Green

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Use of Motorized Equipment is Vital to Turfgrass Management

- Mechanical failure
- Human error





# Mechanical Failure and Human Error The Perfect Storm?

**Phytotoxic to Grass  
Pollution Event**

**Courtesy Joseph Hubbard**

# Objective: Determine the Dynamics of Machine Fluid Injury

Learn More About Injury Behavior  
Find Better Injury Mitigation Tactics

Photo Courtesy Josh Gelman

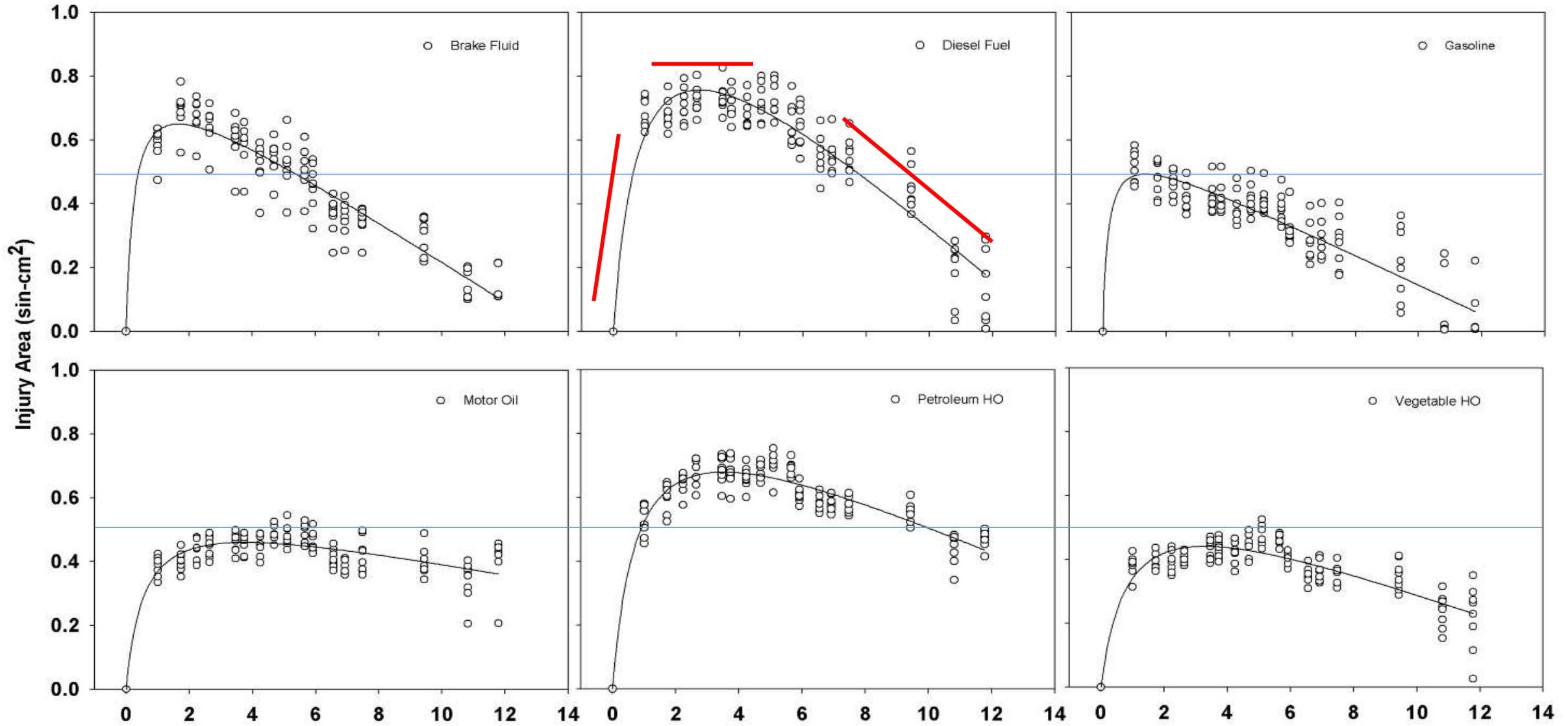
# Dynamics: Injury Behavior with Time

**Injury Area    Loss of Shoot Color    Spatial Distribution**



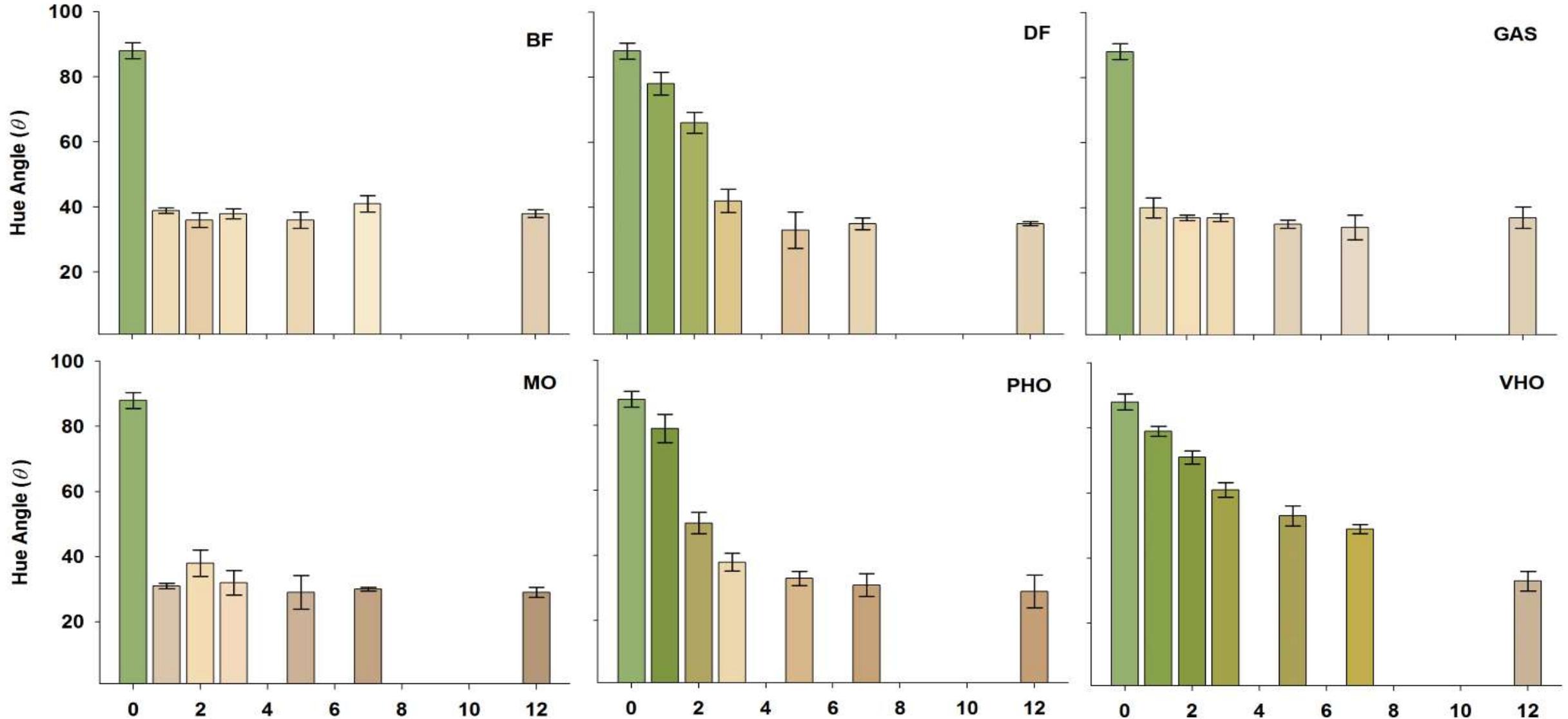
**Brake Fluid  
Diesel Fuel  
Gasoline  
Motor Oil  
Petroleum Hydraulic Oil  
Vegetable Hydraulic Oil**

# Injury Area (cm<sup>2</sup>)



**Injury from Higher Viscosity Fluids Began Healing Later and Took Longer to Heal**

# Visual Green Color Loss (hue angle °)



Induce VGCL in Shoots Probably by Dissolving Cell Membranes

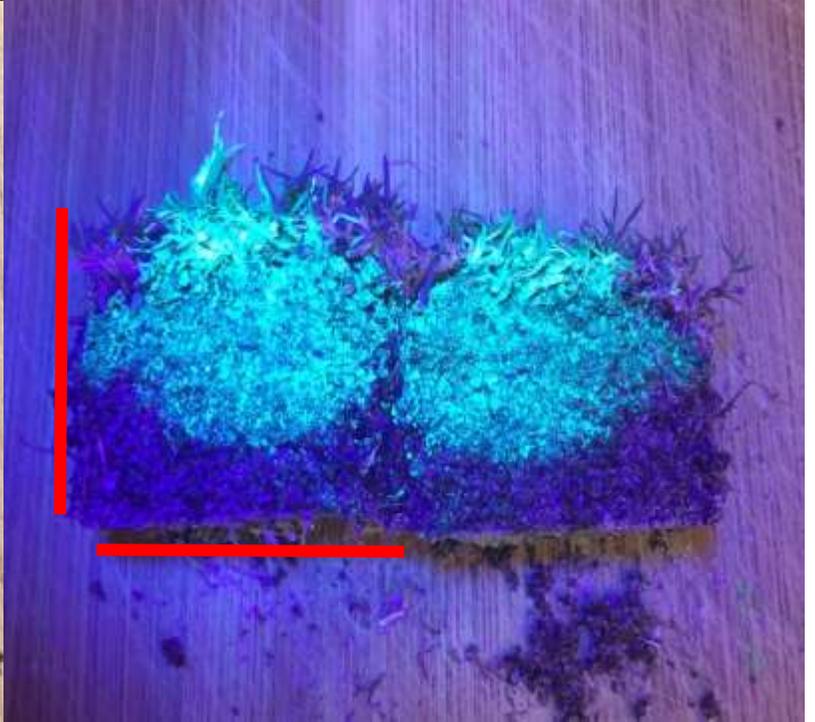
# Spatial Distributon

UV Fluorescence at  
362 nm

1.5 in diameter



# Fluid Effects on Both Roots and Shoots





**Washed**

**8 DAT**



**Unwashed**



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