

# **Dynamics of Machine Fluid Injury on a Bermudagrass Green**

**William L. Berndt, Ph.D.**

**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

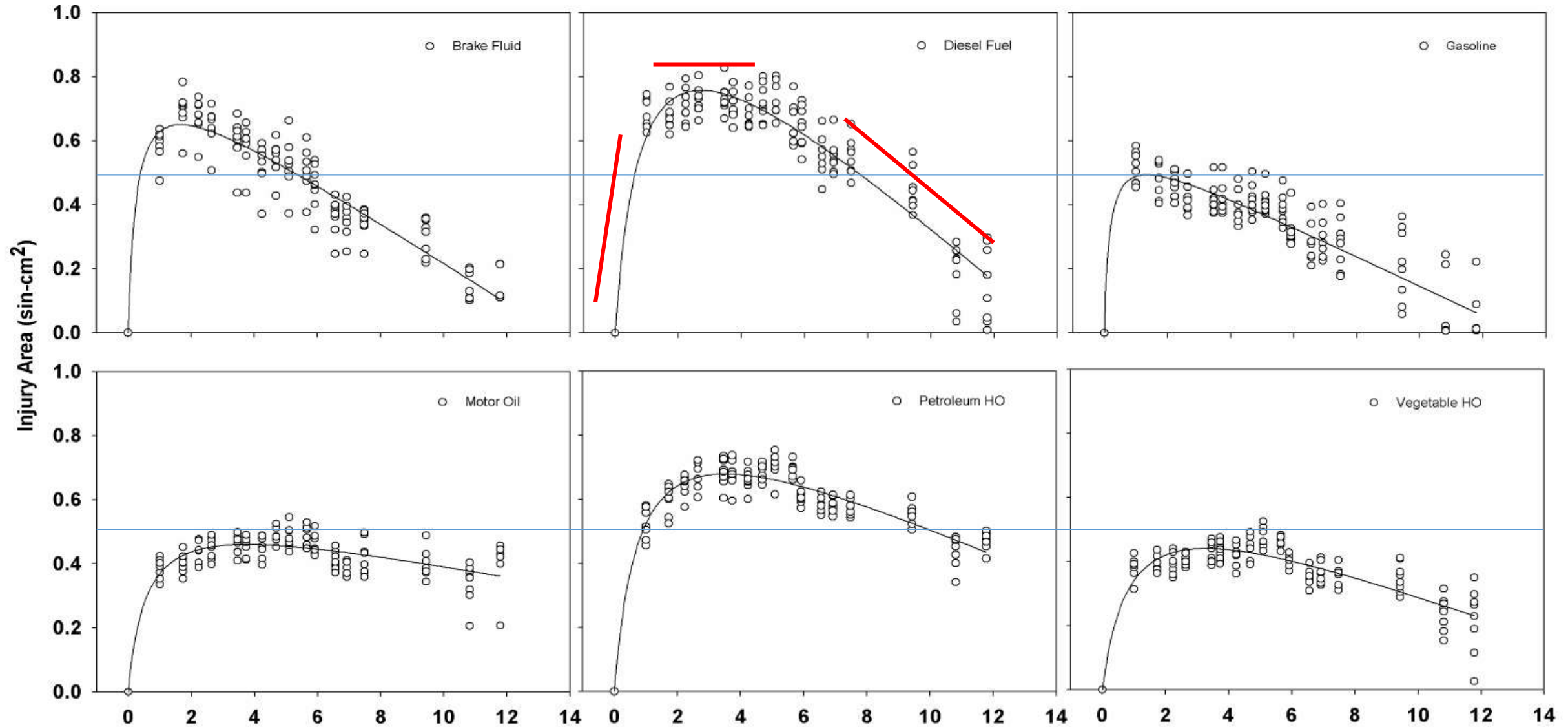
**Injury Area      Loss of Shoot Color      Spatial Distribution**



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

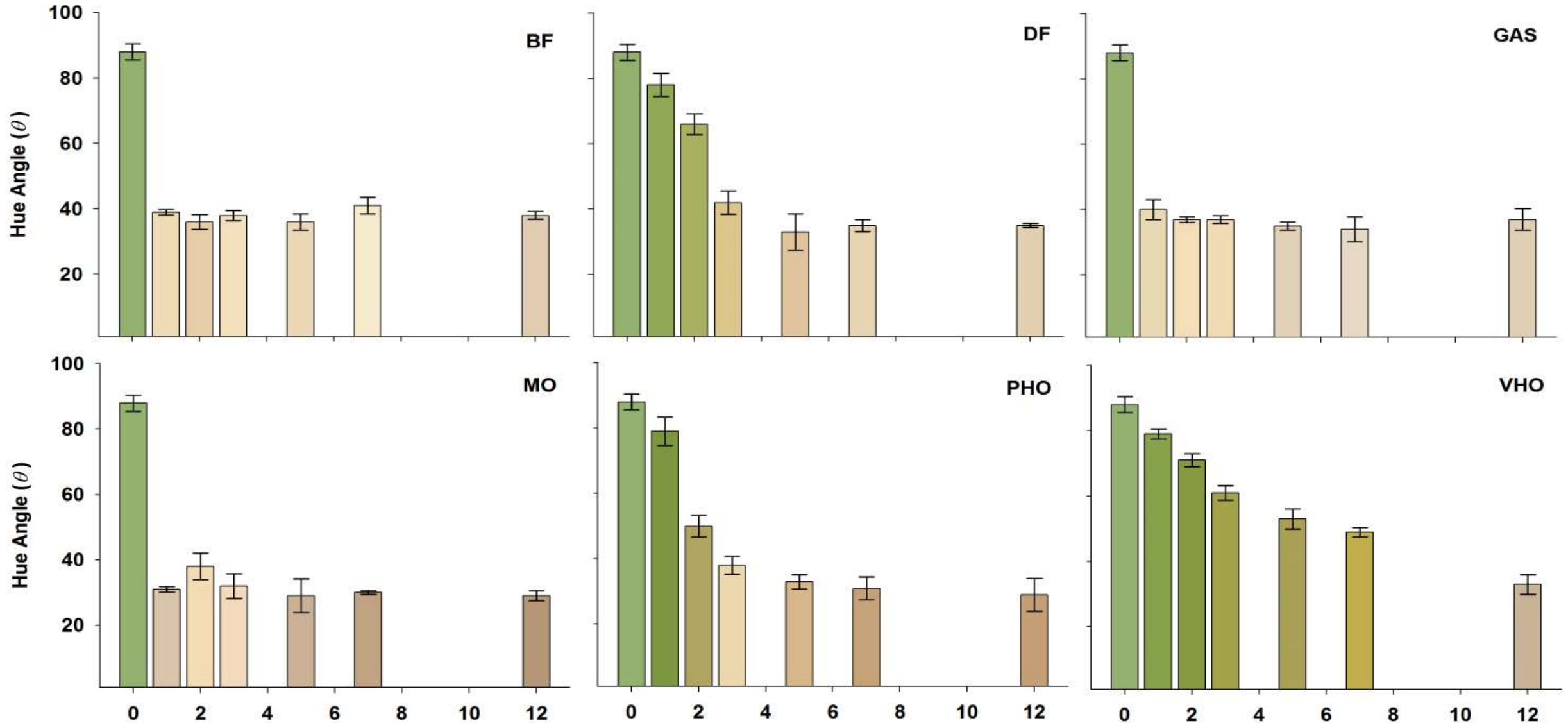


# Injury Area (cm<sup>2</sup>)



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

# Visual Green Color Loss (hue angle °)

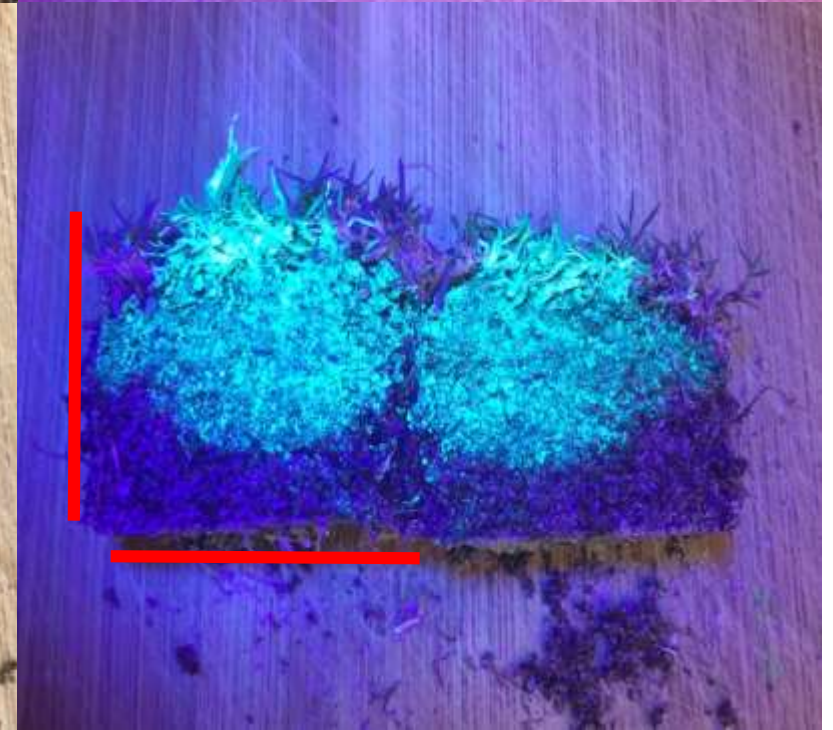


Induce VGCL in Shoots Probably by Dissolving Cell Membranes

# Spatial Distributon

UV Fluorescence at  
362 nm

Fluid Effects on Both Roots  
and Shoots









**Washed**

**8 DAT**



**Unwashed**





**Dr. Lee Berndt 239-246-0396**  
**Leeberndt@aol.com @Dr\_Lee\_Berndt**