



Pollution Prevention For First Responders

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Session Overview

- Cases where Pollution Prevention (P2) might have helped
- Why P2 should be important for responders
- P2 overview and examples
- What you can do
- Resources



What Happened in Henderson in 1988?



Sequence of Events

- Welding torch starts fire
- Fiberglass walls in steel frame building catch fire
- Fire spreads to 55 gallon drums containing ammonium perchlorate next to building
- Fire consumes thousands of 55 gallon drums stacked in storage, explosion results
- Greater secondary explosion of aluminum shipping totes



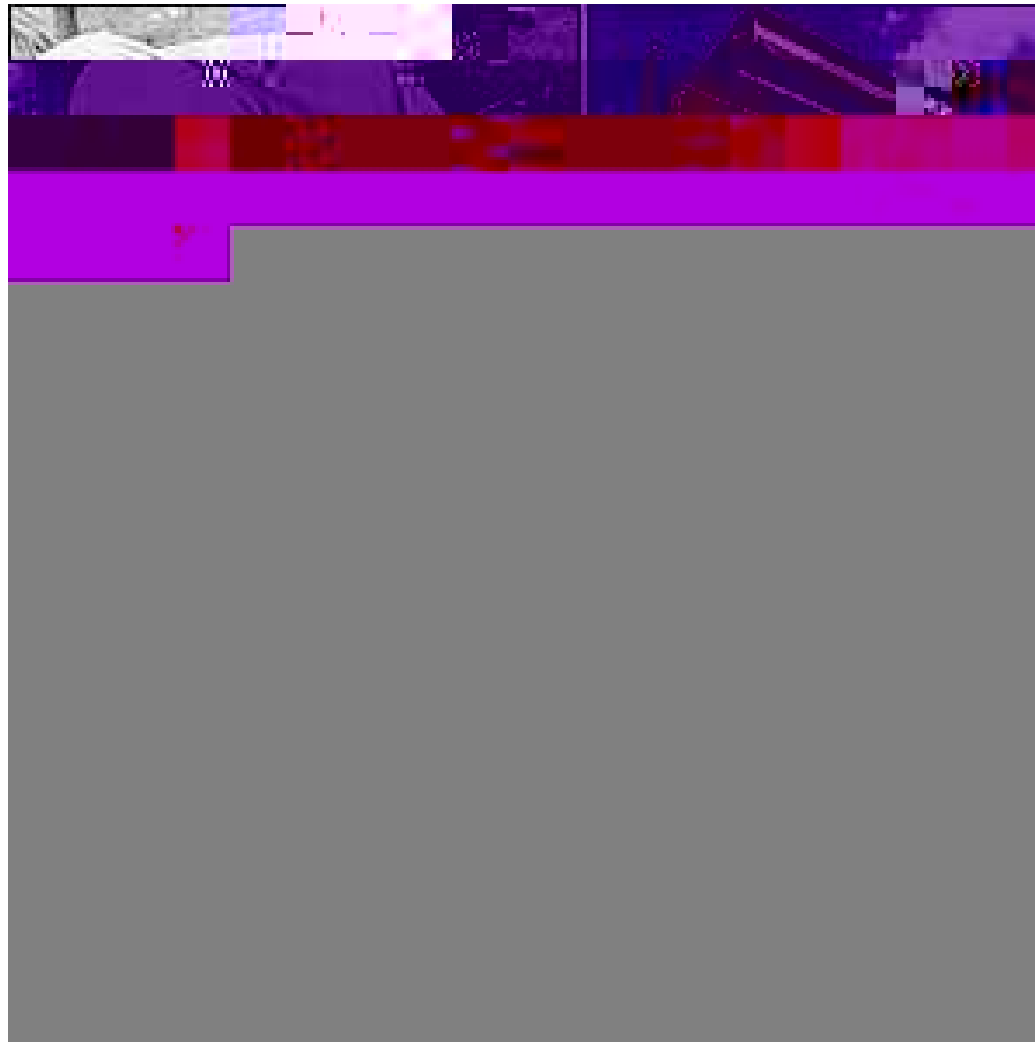


Why was 8.5 million pounds of ammonium perchlorate staged onsite?





What Happened in India in 1984?



What Happened?

① Runaway reaction





Causes of Disaster

- Water introduced to MIC tank
- Lack of immediate management response
- Te6p and pressure gauges unreliable
- MIC refrigeration unit shut off
- MIC gas scrubber shut off
- MIC flare tower shut off
- Water curtain inadequately designed
- Lack of effective warning systems
- MIC storage tank filled above capacity
- Reserve MIC tank already full



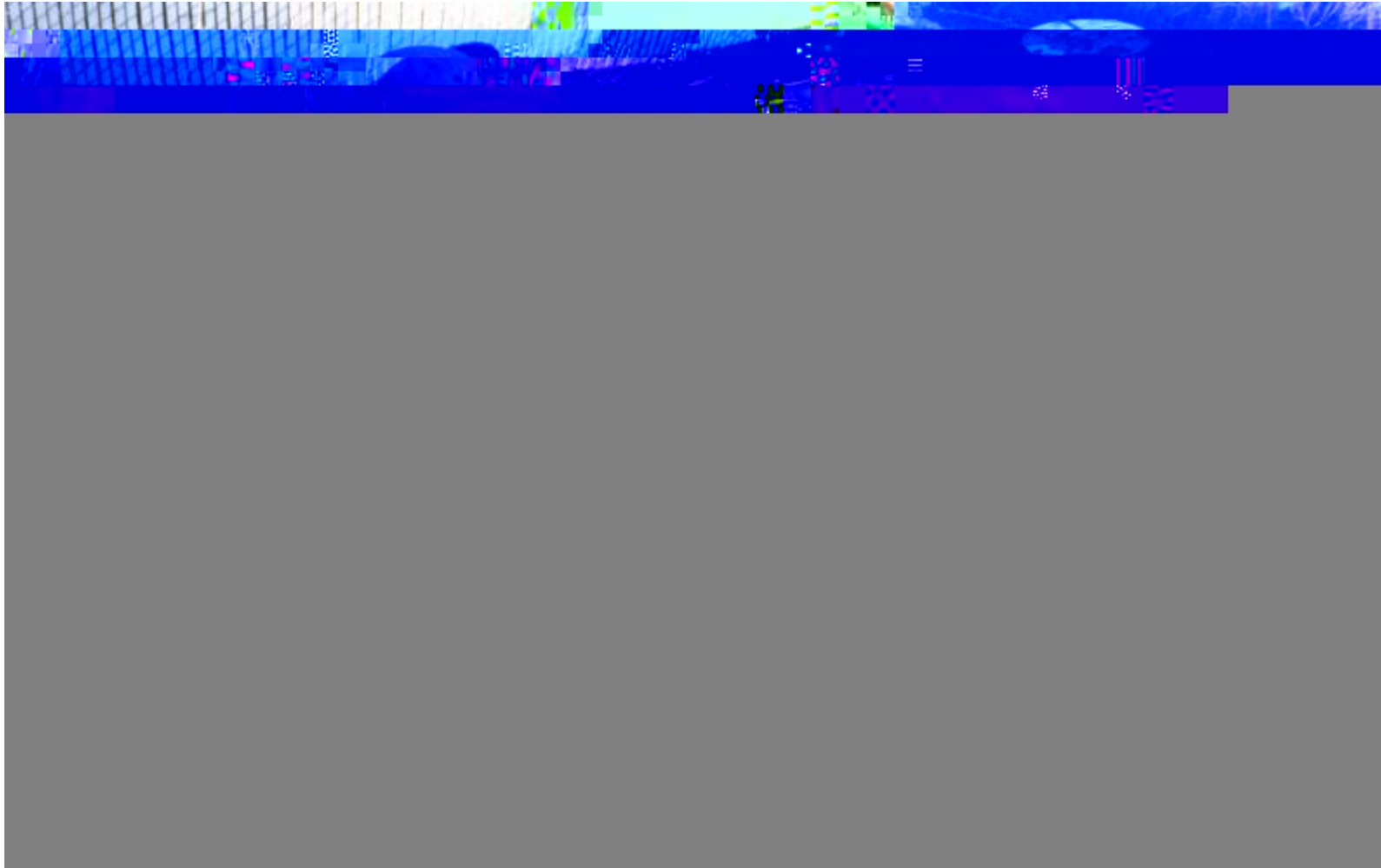
Pollution Prevention View

- 41 Tons of MIC was the cause of the disaster.
- Process integration on the Bhopal facility

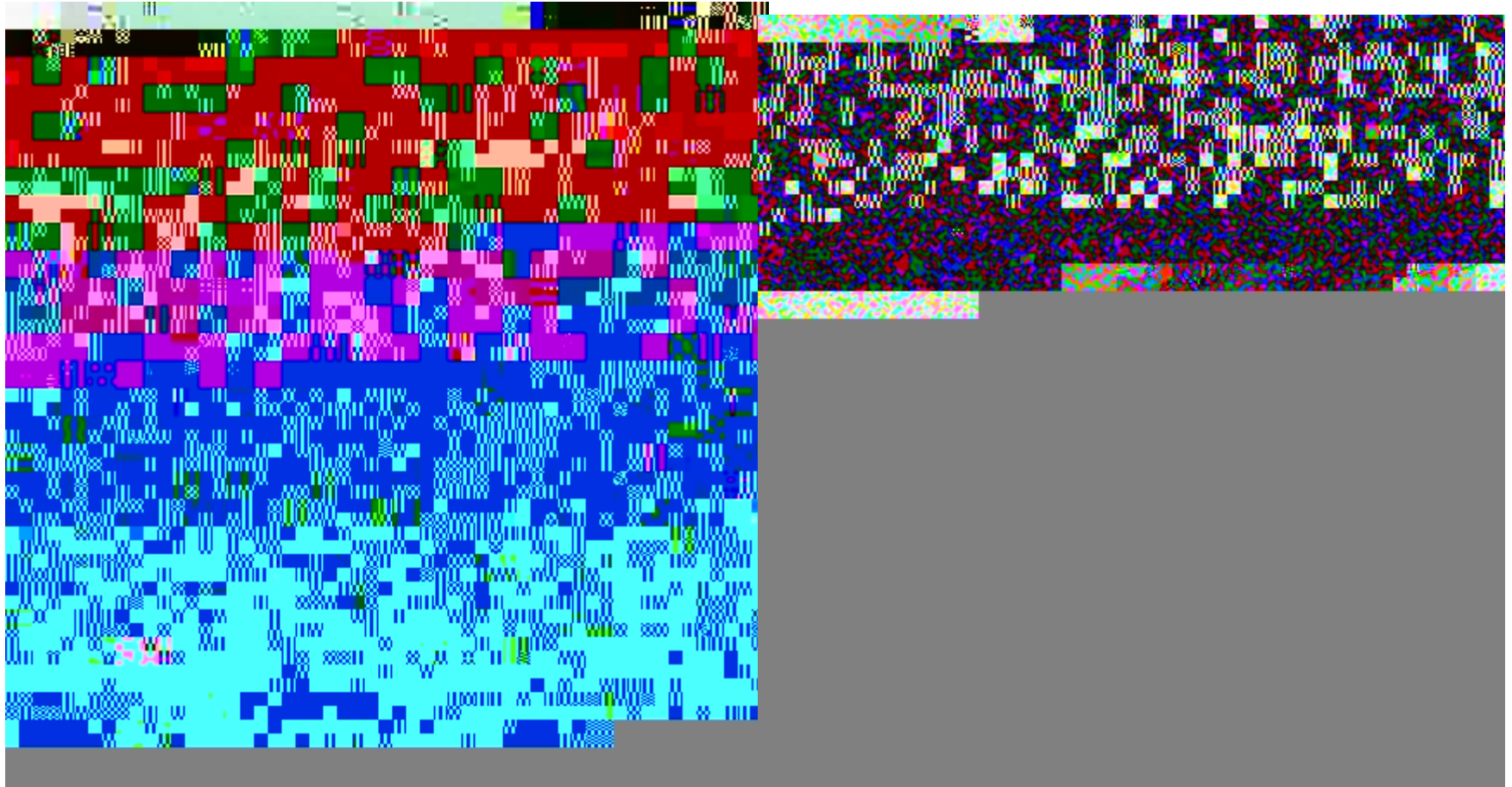


Sparks, NV 1997

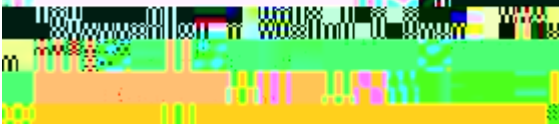
1997 Flood



1997 Flood



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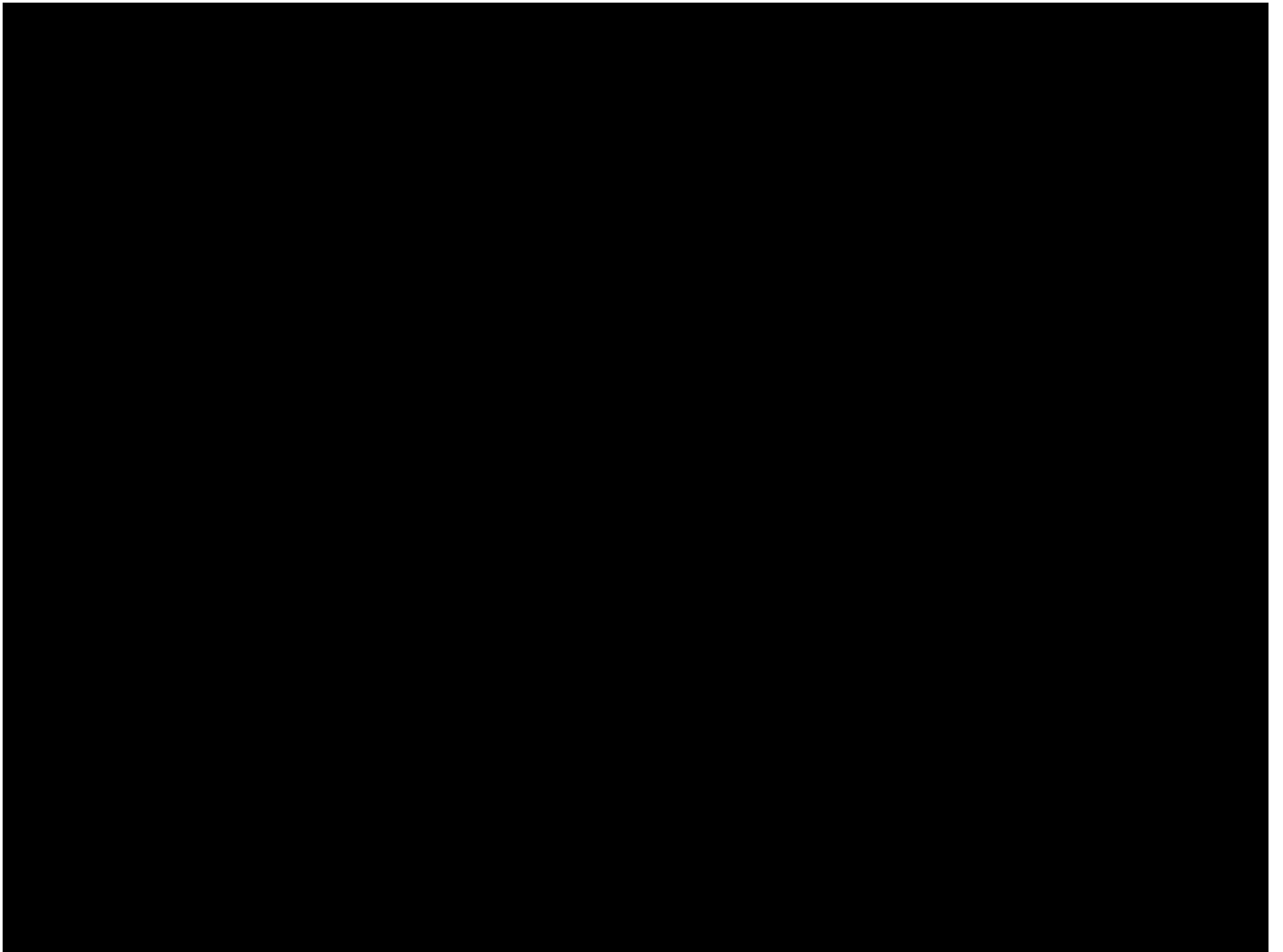
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Benefits to Responders

- Fewer hazardous materials at facilities
- Lower quantities of hazardous materials
- Better information on hazardous material inventories
- Less hazardous materials in transport
- Reduced risk of release
- Smaller releases







Inventory Control

- Just in Time (JIT)
- First In, First out (FIFO)





First In First Out

- Materials management
- Reduces spoilage





Pharmacy Operations of Hazardous Materials



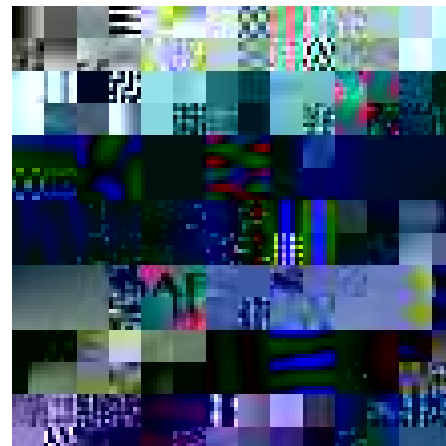
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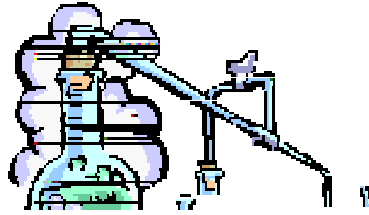
Pharmacy Theory

- Minimize hazardous materials (and cost)
- Reduce HW Disposal cost
- Provide customer easy access to supplies, materials, & MSDSs
- Better control over materials used in work processes





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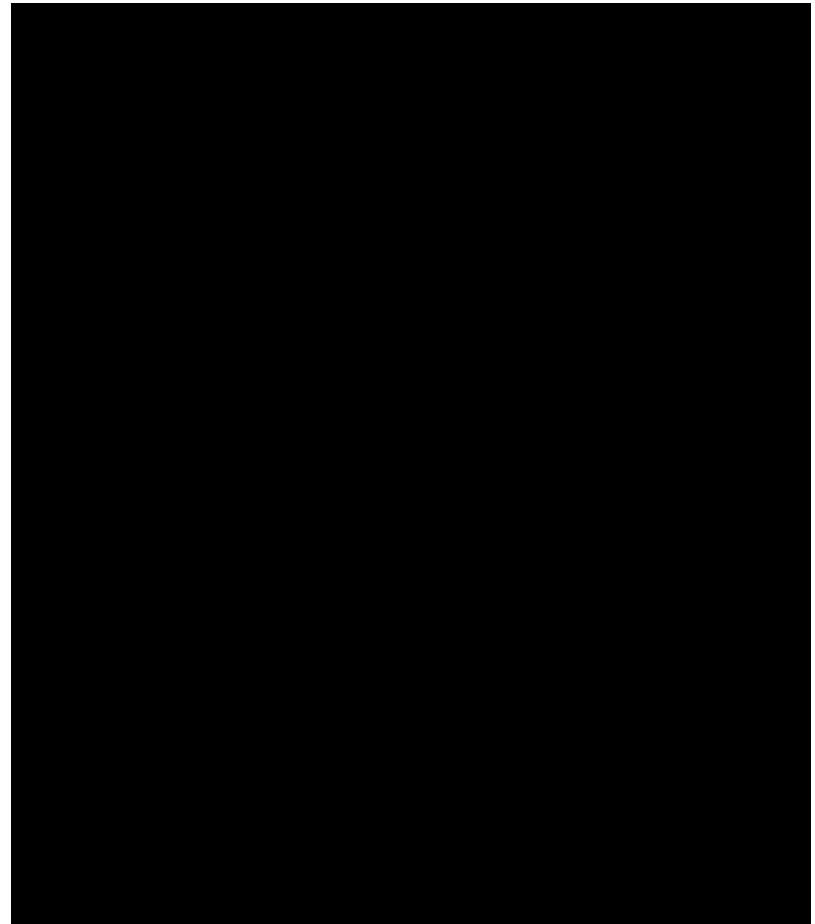


Solvents Types

- Chlorinated Solvents
- Petroleum hydrocarbon based
 - Low flash (<140°F)
 - High flash (>140°F)
- Terpene (plant derived)
- Aqueous
 - Non-microbial
 - Microbial



Aqueous Cleaners





Solvents

- The key questions that need to be asked?
 - Can I reduce the amount of solvent I use?



Solvent Distillation

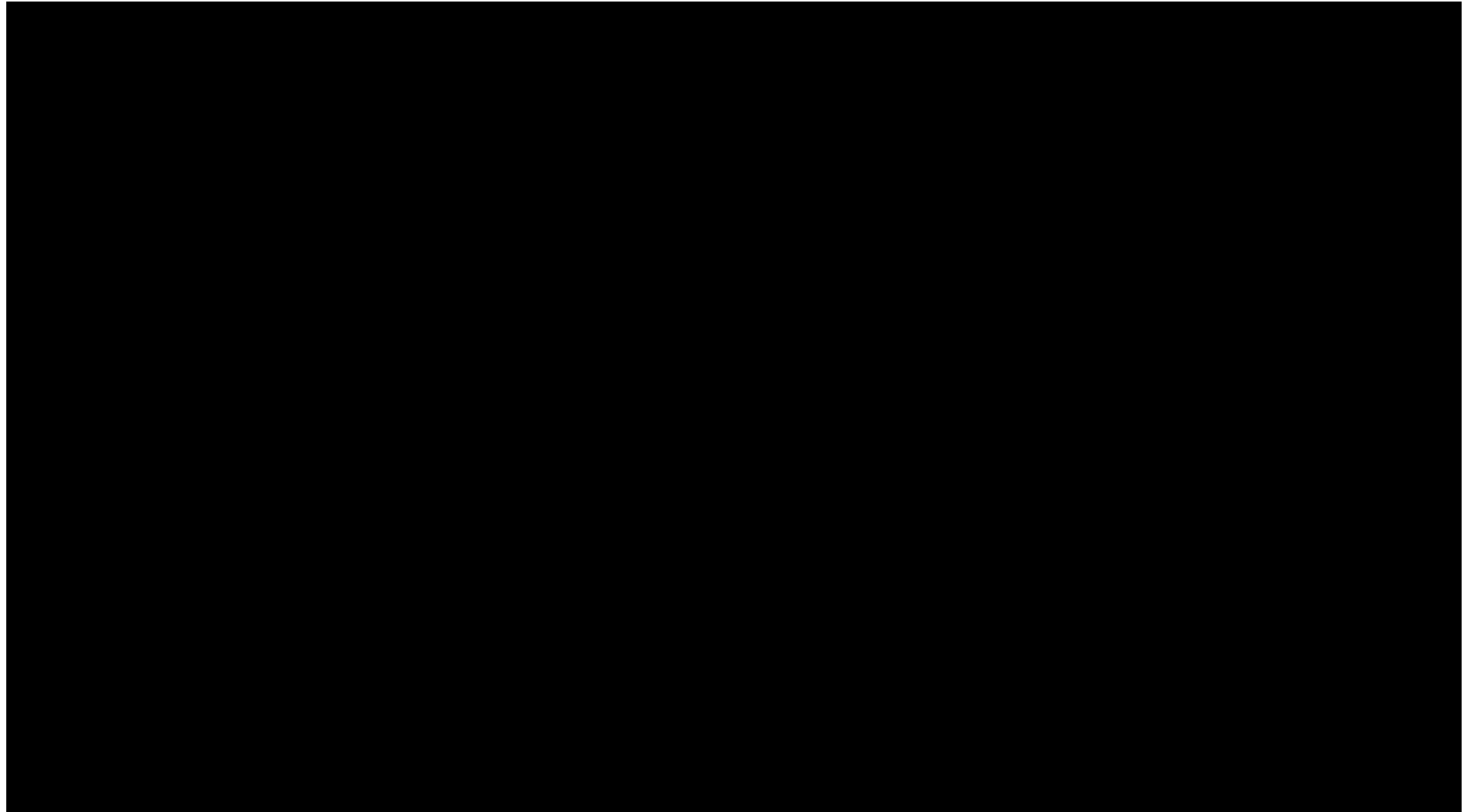
- Autobody shops
- Cabinet shops
- Industrial Solvents





Paints

- Automotive Clear Coats – up to 7lbs/gal VOCs
- High Solids Paints -2-3lbs/gal. VOCs
- Industrial Polyurethanes – 3-4 lbs/gal. VOCs
- Waterborne – less than 1lb/gal VOCs
- Powdercoat - Zero

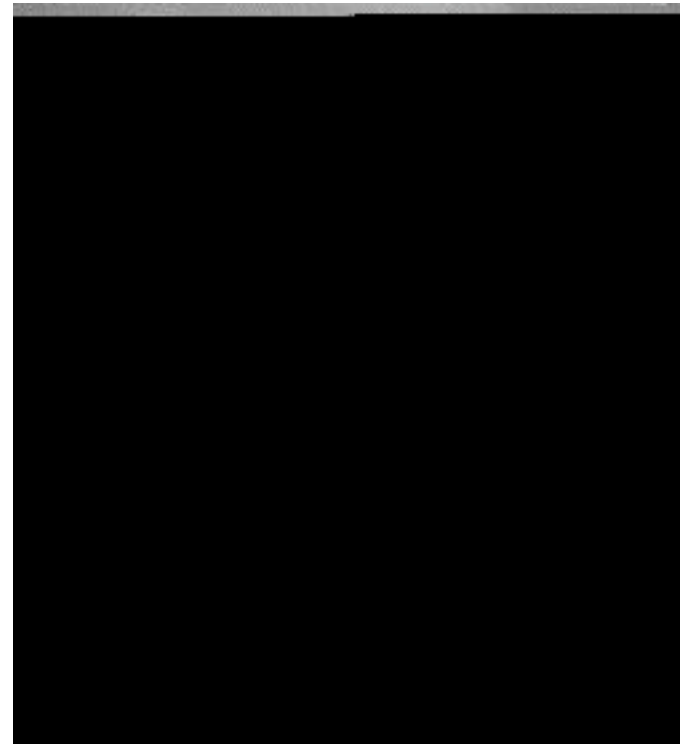






Janitorial Dangers

- Six out of every hundred professional janitors are injured by the chemicals that they use each year.
 - Burns to the eyes and skin
 - Breathing toxic vapors.





Facts

- Harmful Chemicals
- Physical Incompatibilities
- Some Chemistry Increase BOD
- Some Chemistry is Toxic to Aquatic life



Janitorial Dangers

- One third of the cleaning chemicals used today have ingredients that can harm you.
 - **Butoxyethanol** -Window Cleaners
 - **Hydrochloric/ Phosphoric Acid**- Toilet Cleaners
 - **Sodium Hydroxide** Degreasers

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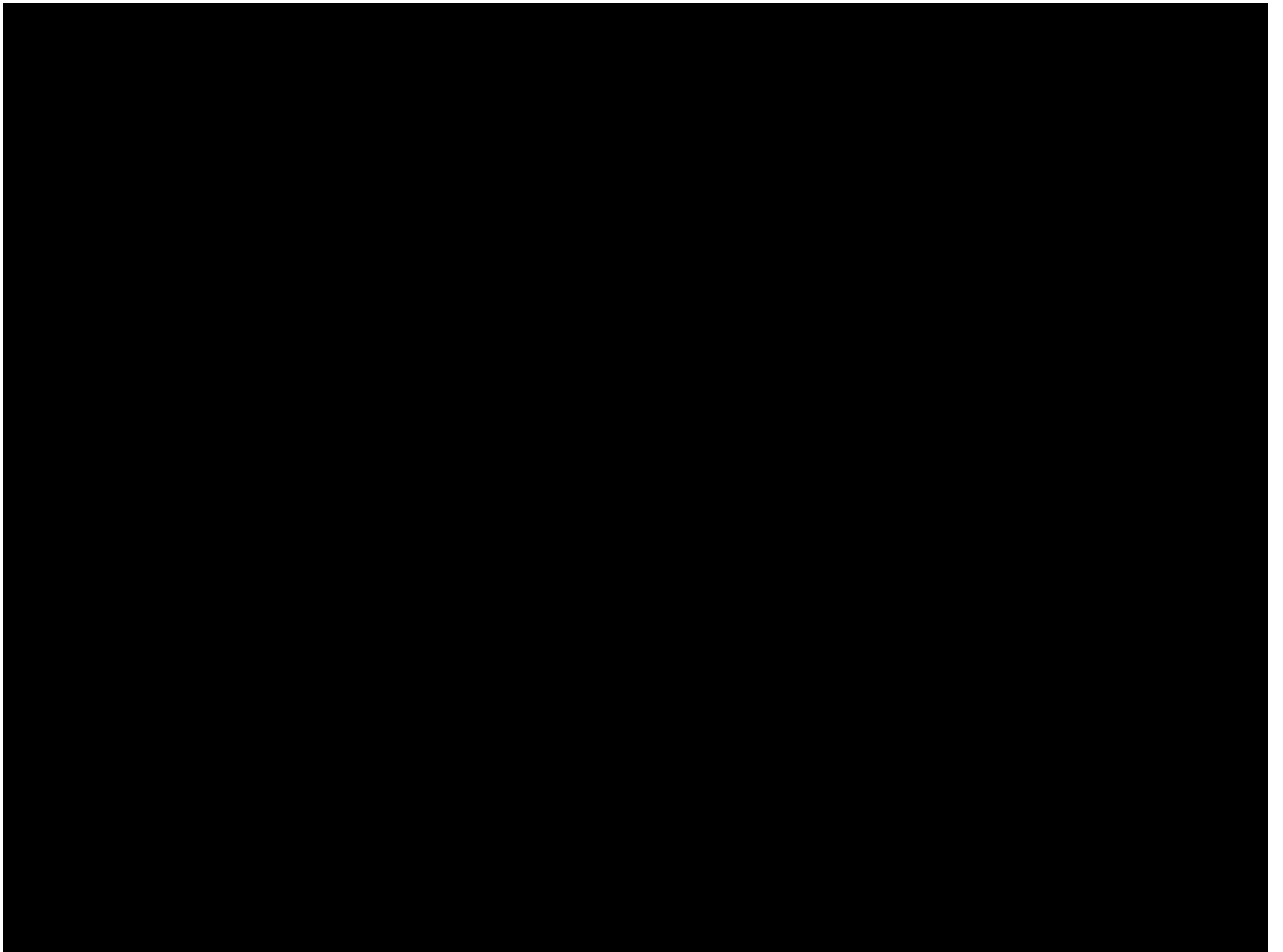




Did it Succeed?



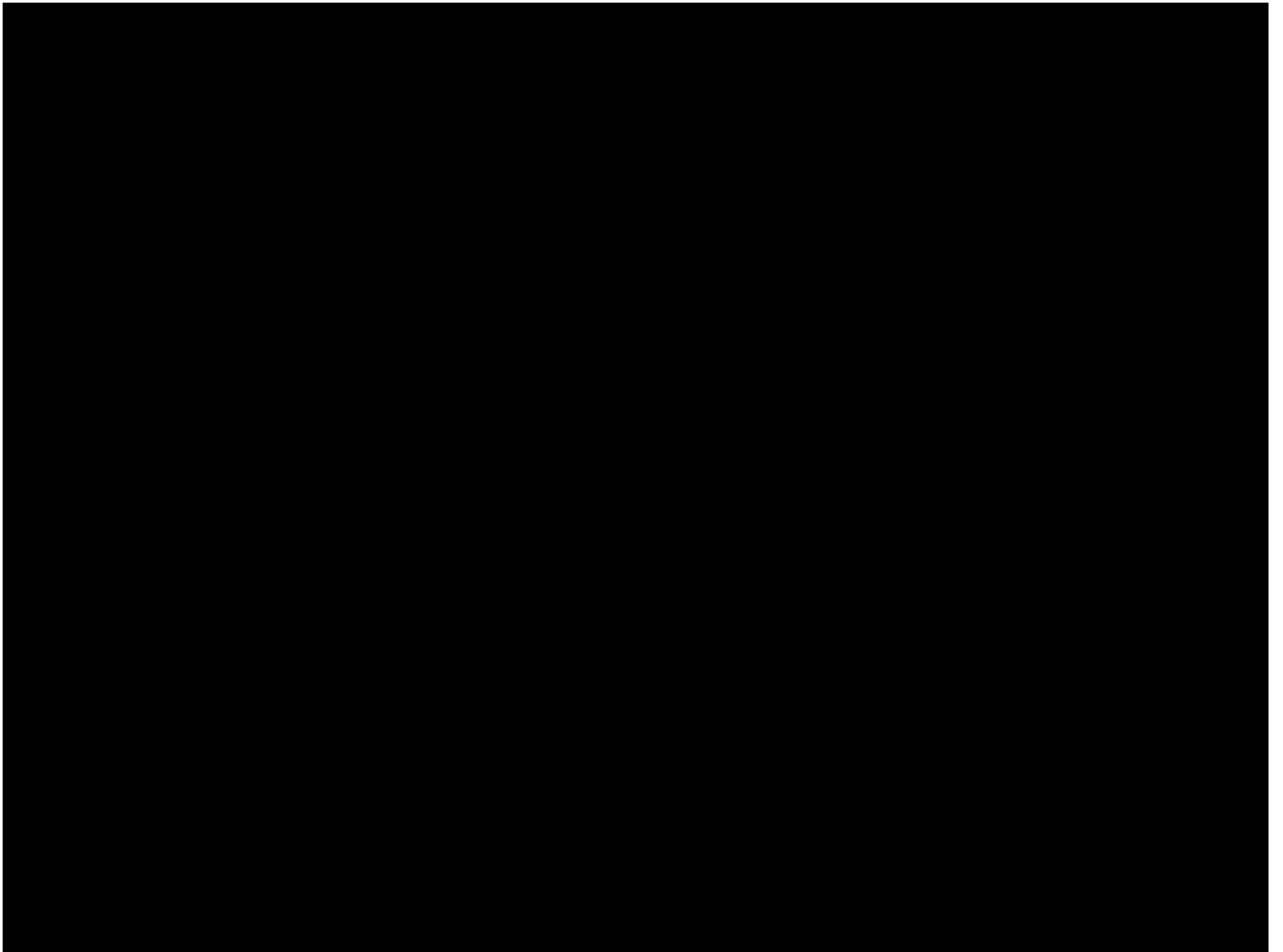
- You Bet!
- Reduction of products used by 80%
- 130 Different Products to 15 Products that are Environmentally Preferable





Sacramento River Spill

- Southern Pacific Railroad train derailed on Cantara Loop bridge
- Tanker carrying metam sodium punctured spilling 19,500 gallons soil fumigant into the river.
- I-5 closed, citizens evacuated
- Killed all aquatic life for 38 miles downstream to Lake Shasta.







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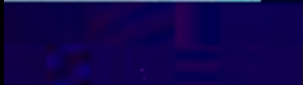
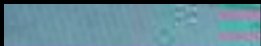


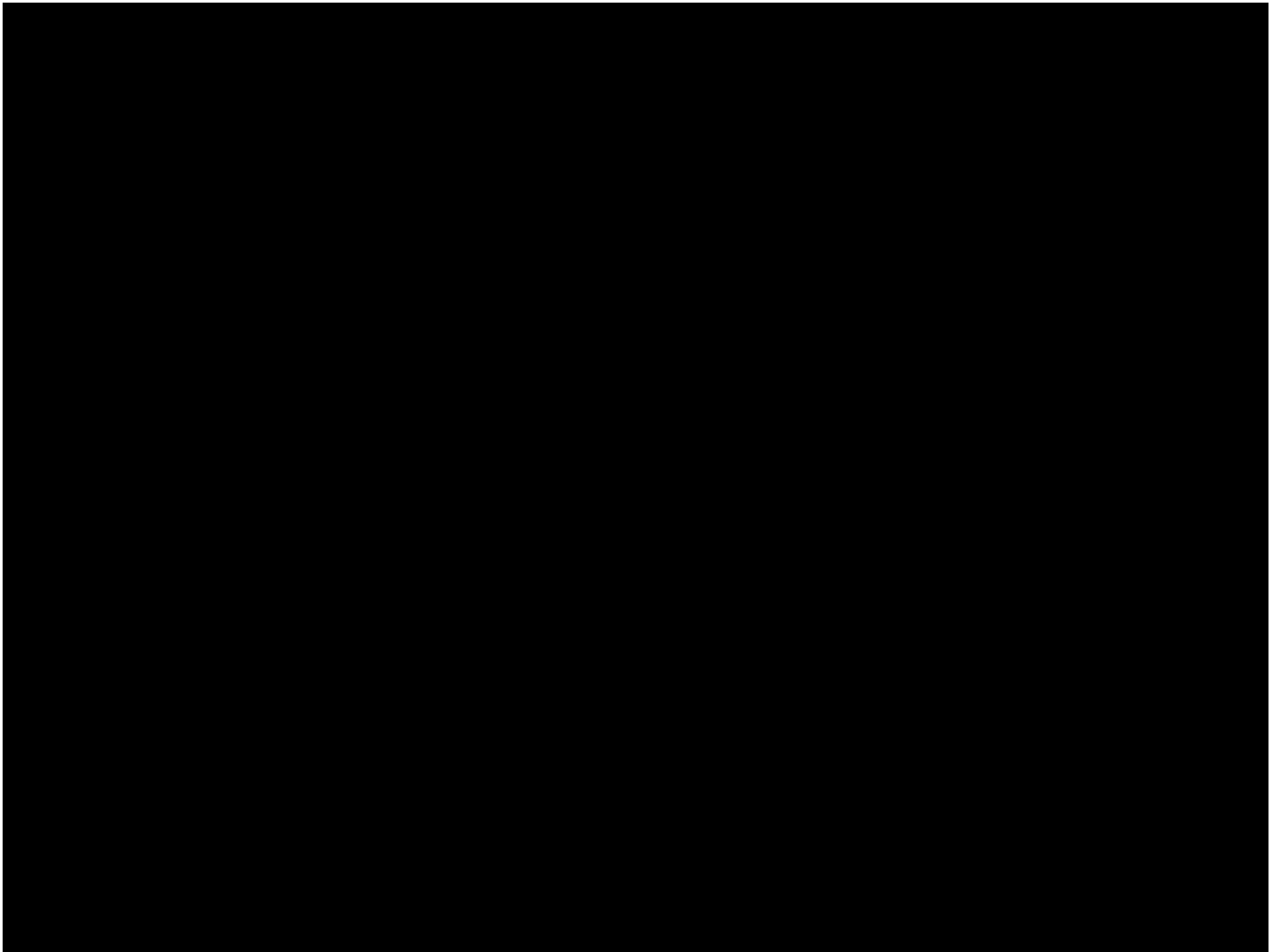


Integrated Pest Management

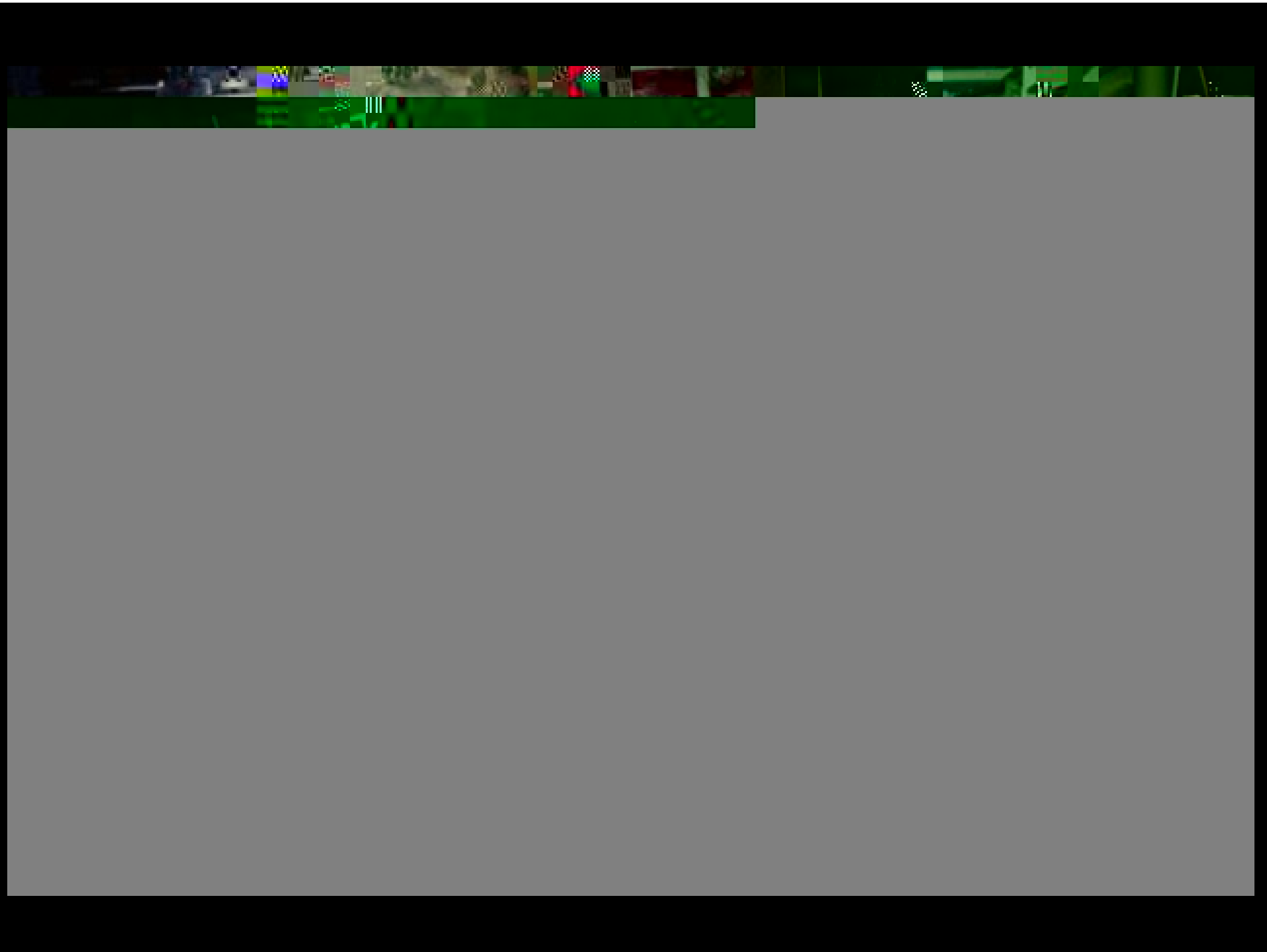
IPM is:

- eliminating insect, disease and weed pest problems — not eradicating all pests
- applying pesticides, fertilizers or irrigation only when the benefits outweigh the costs
- considering all of your pest management options, including natural, biological, cultural and chemical methods











What You Can Do...

