LEADERSHIP IN REDUCING VOCs FROM SOIL-APPLIED PESTICIDES –

The UCIPM Story

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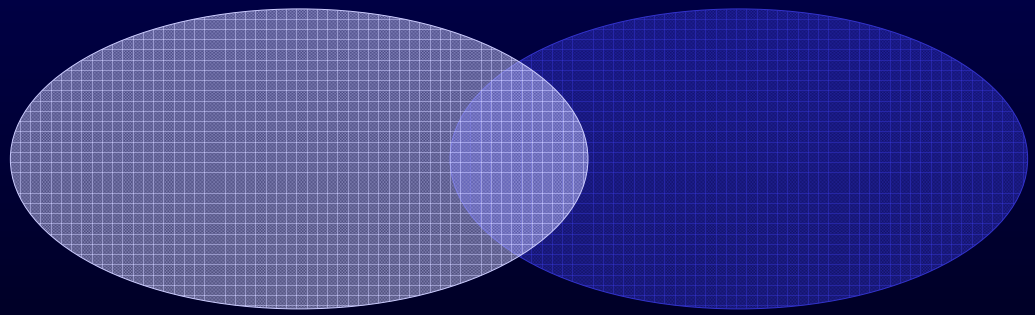
University of California Integrated Pest Management Program mandate since 1979:

"Protect Human Health and Reduce Pesticide Impact on the Environment"

UCIPM programs are based on complementary and interactive approaches:

Research ⟷ **Education**



UCIPM-Administered Competitive Research Grant Programs:

- Core Research Grants (current)
- Exotic/ Invasive Pests & Diseases Research Grants
- Smith-Lever Implementation Grants

UCIPM Education/Extension Resources:

- Personnel
- **Manuals & IPM Guidelines**
- Websites


ALTERNATIVES TO
SOIL FUMIGANTS
for mitigation of:
• Atmospheric ozone depletion
• VOC air pollution

UCIPM has sponsored more than 100 multi-year research and education projects (1979-2007) targeting soilborne:

- Pathogens
- Nematodes
- Weed propagules
- Insects

Cultural / Physical / Chemical Approaches:

- Water / nutrient mgt.
- **Avoidance**
- Tillage modifications
- **Solarization**
- Biofumigation / Crop Rotation / Cover Crop
- **Reduced risk pesticides**

Biological Approaches:

- Predation / Parasitism / Competition
- Soil community alterations
- Host plant resistance

Several projects funded by UCIPM have explored soil treatment by:

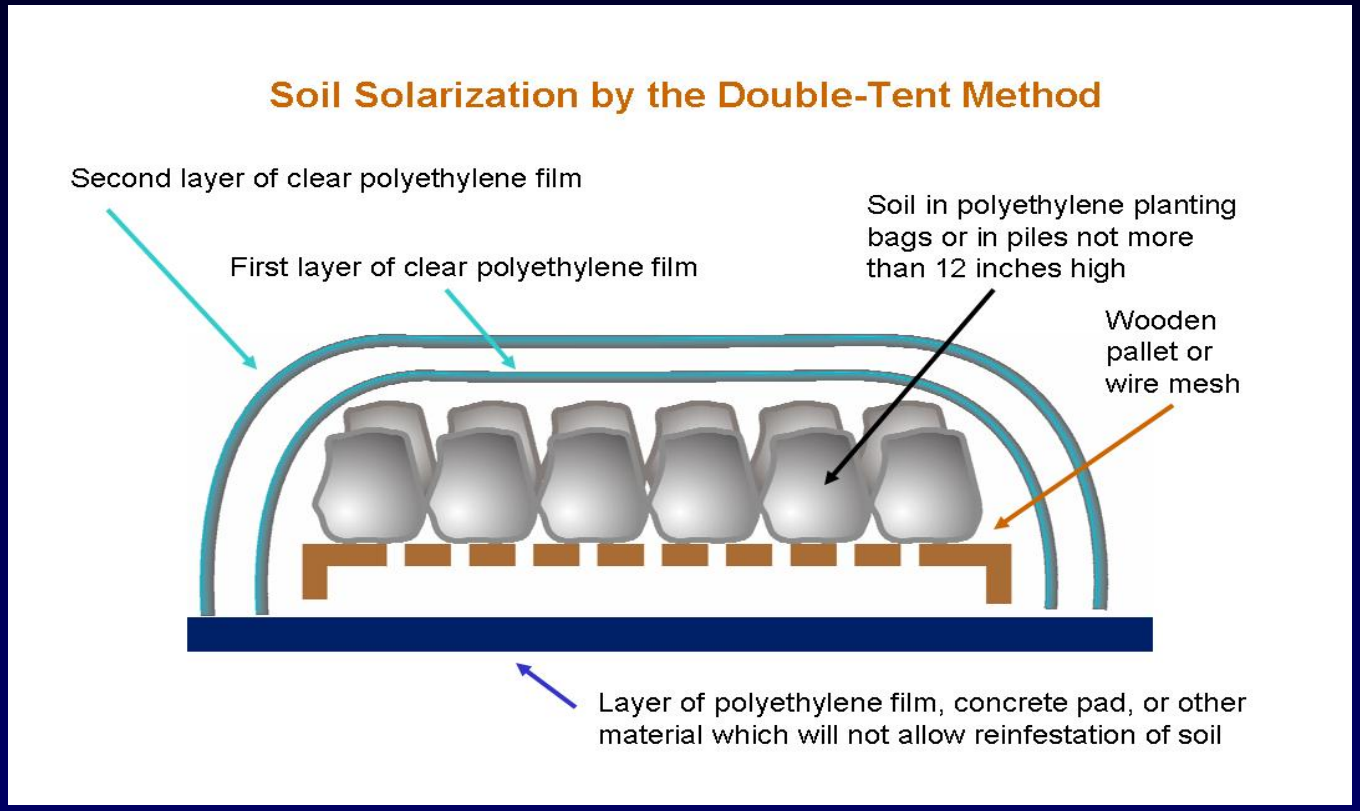
- **Solarization**

and

- **Biofumigation**


SOIL
SOLARIZATION

“Double-tent” solarization has been approved by CDFA for production of nematode-free nursery stock

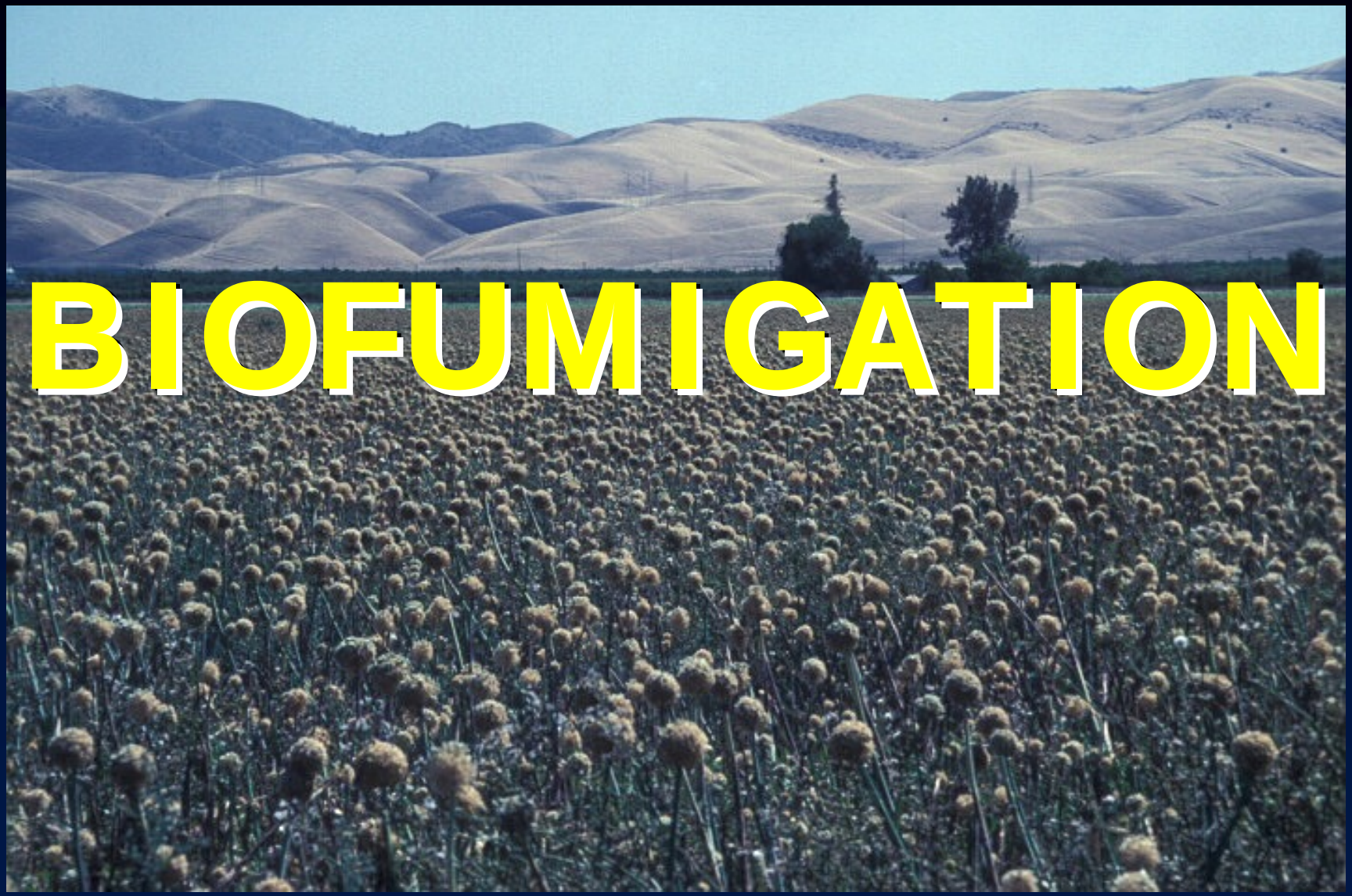


Adapted from CDFA
http://www.cdfa.ca.gov/phpps/pe/nipm_pdfs/nipm_7.pdf

Solarization - What are the Limitations?

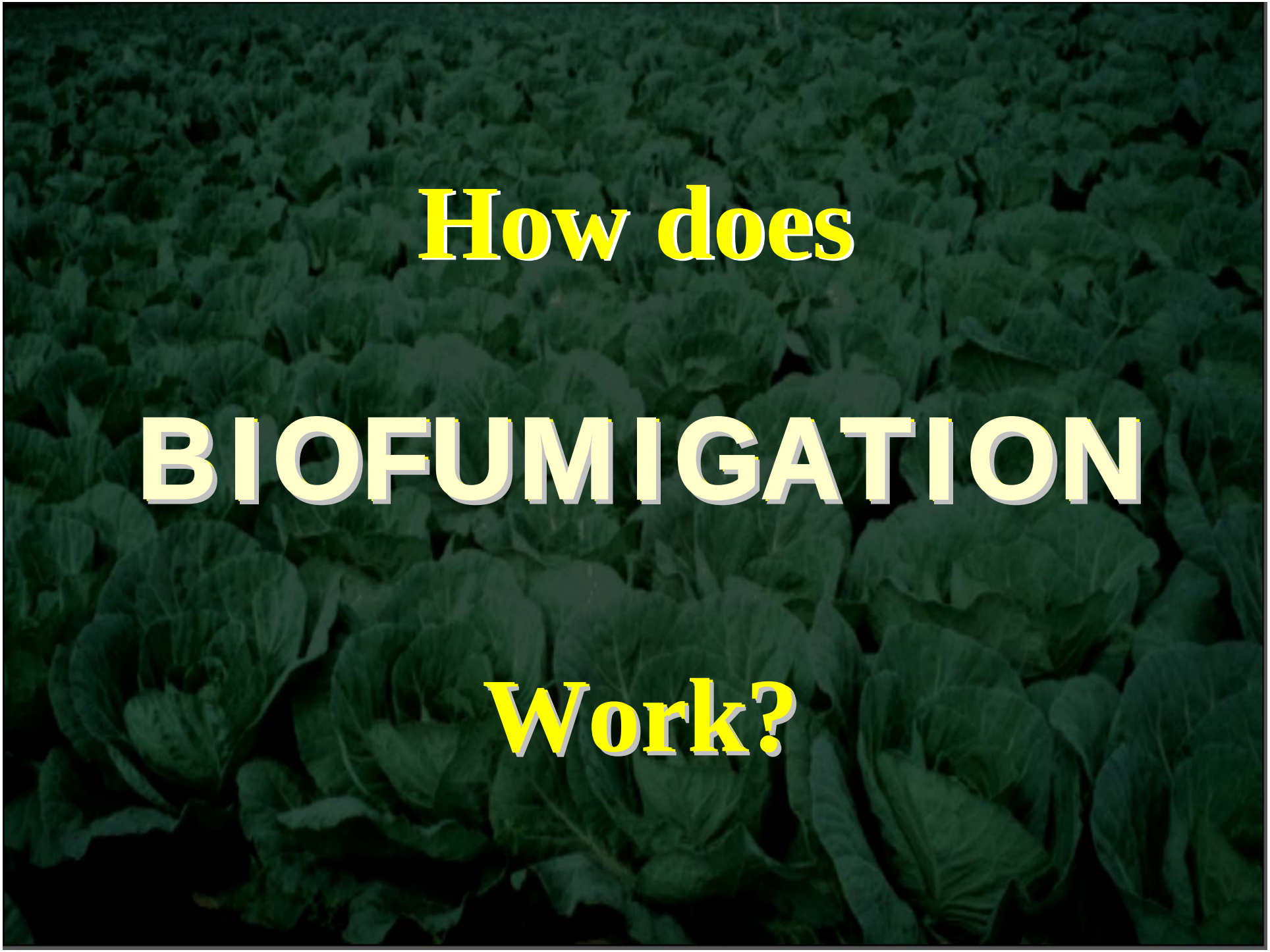
* Climate / Weather
* Land out of production during summer(?)
* "Top-down heating"
* Some resistant pests
* Few "product reps"


FILM TECHNOLOGY NEEDS:
* Polymer composition
* Permeability
* Durability (multi-purpose?)
* Recycling / Disposal


BIOFUMIGATION

BIOFUMIGATION

Release of biotoxic compounds from organic materials (roots or residues of cash or cover crops; green manures) during growth or decomposition in soil, which results in reduction of pest organism populations or activity.


How does
BIOFUMIGATION
Work?

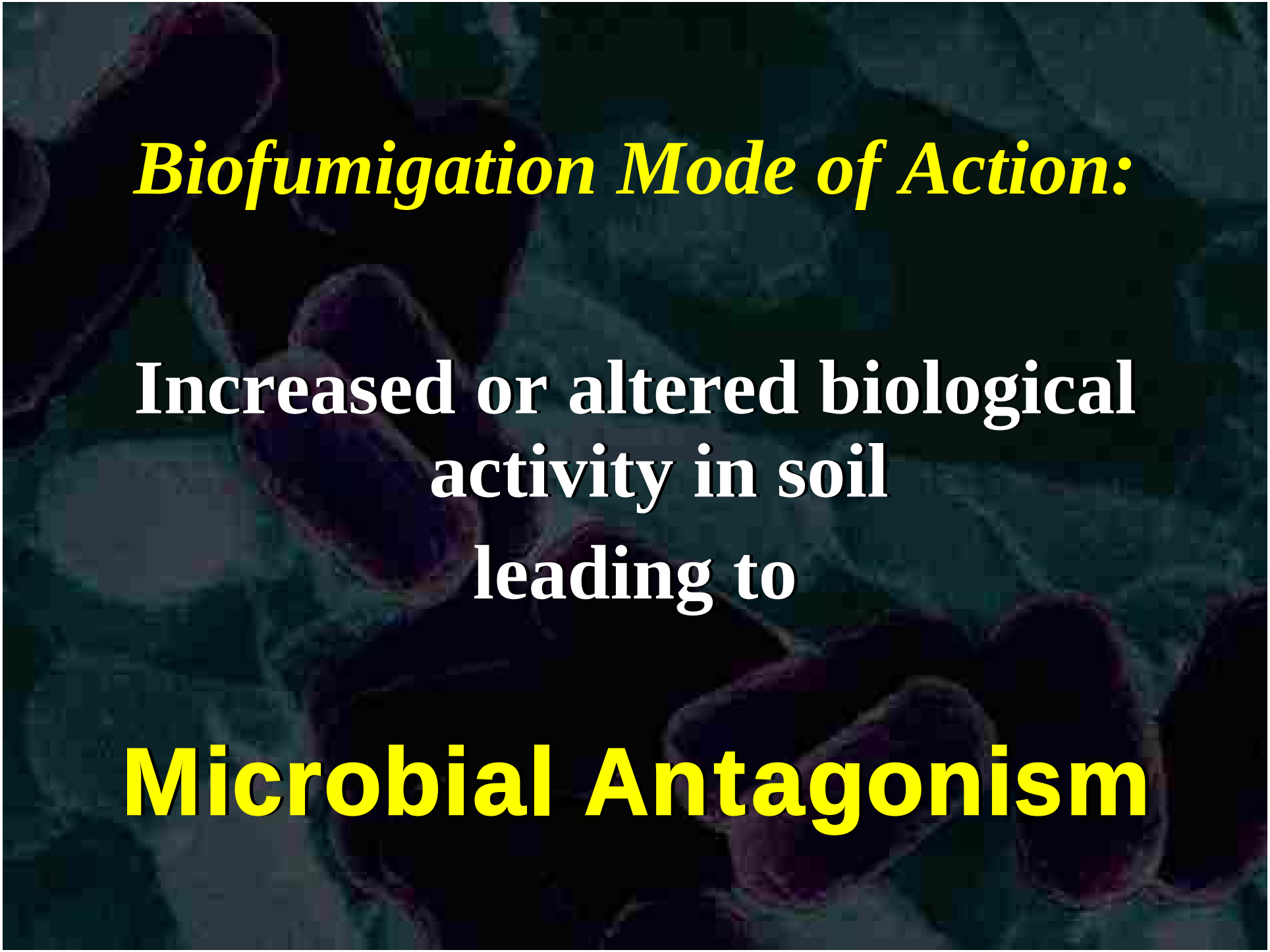
Biofumigation Mode of Action:

Biotoxic Compounds

(Brassica sources most used to date)

- **Glucosinolate hydrolysis (isothiocyanates)**
- **Other compounds (sulfides, sulfoxides, mercaptans, aldehydes, etc.)**

in soil vapor and aqueous phases


Biofumigation Mode of Action:
Increased or altered biological activity in soil
leading to
Microbial Antagonism

Biofumigation - What are the Limitations?

* Frequent mild efficacy or treatment unpredictability
* May need tarp/solarization
* May require growing cover or green manure crop
* Few “product reps”

Be aware of possible

Phytotoxicity (allelopathy)

to following crop

ALTERNATIVES TO FUMIGANTS

Situation-Specific Combinations

Of Treatments =

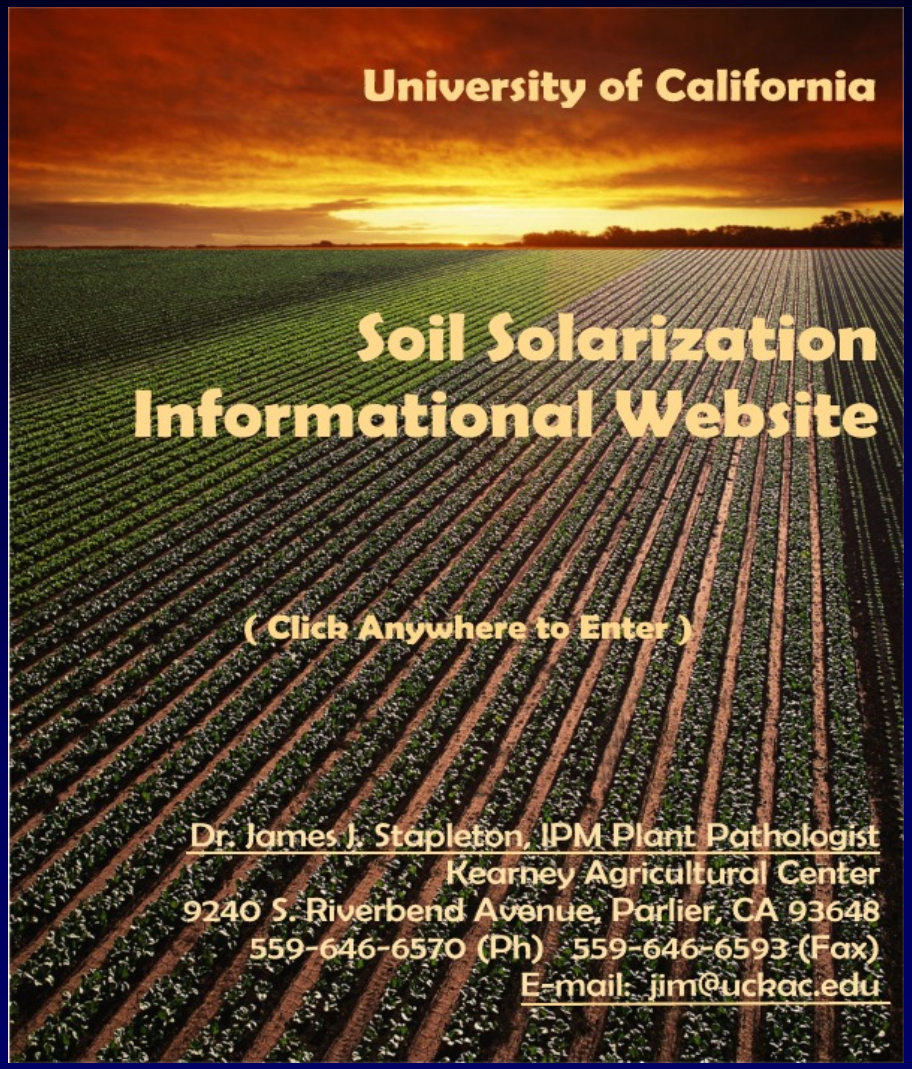
INTEGRATED MANAGEMENT

References:

UNIVERSITY OF CALIFORNIA STATEWIDE IPM PROGRAM WEBSITE:

http://ipm.ucdavis.edu

http://solar.uckac.edu



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