

LEADERSHIP IN REDUCING VOCs FROM SOIL-APPLIED PESTICIDES –

The UCIPM Story

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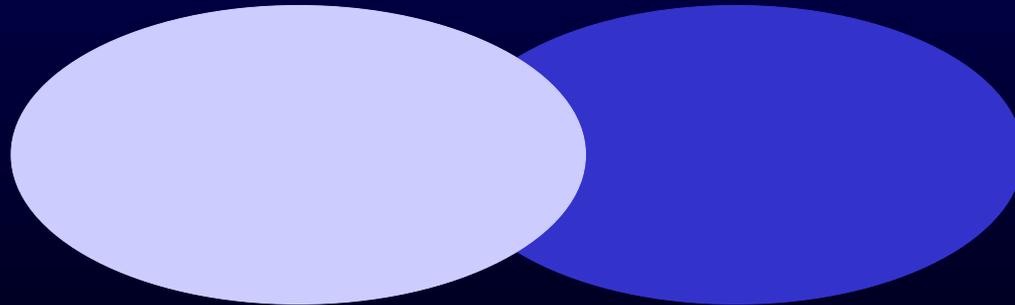
Parlier

**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:

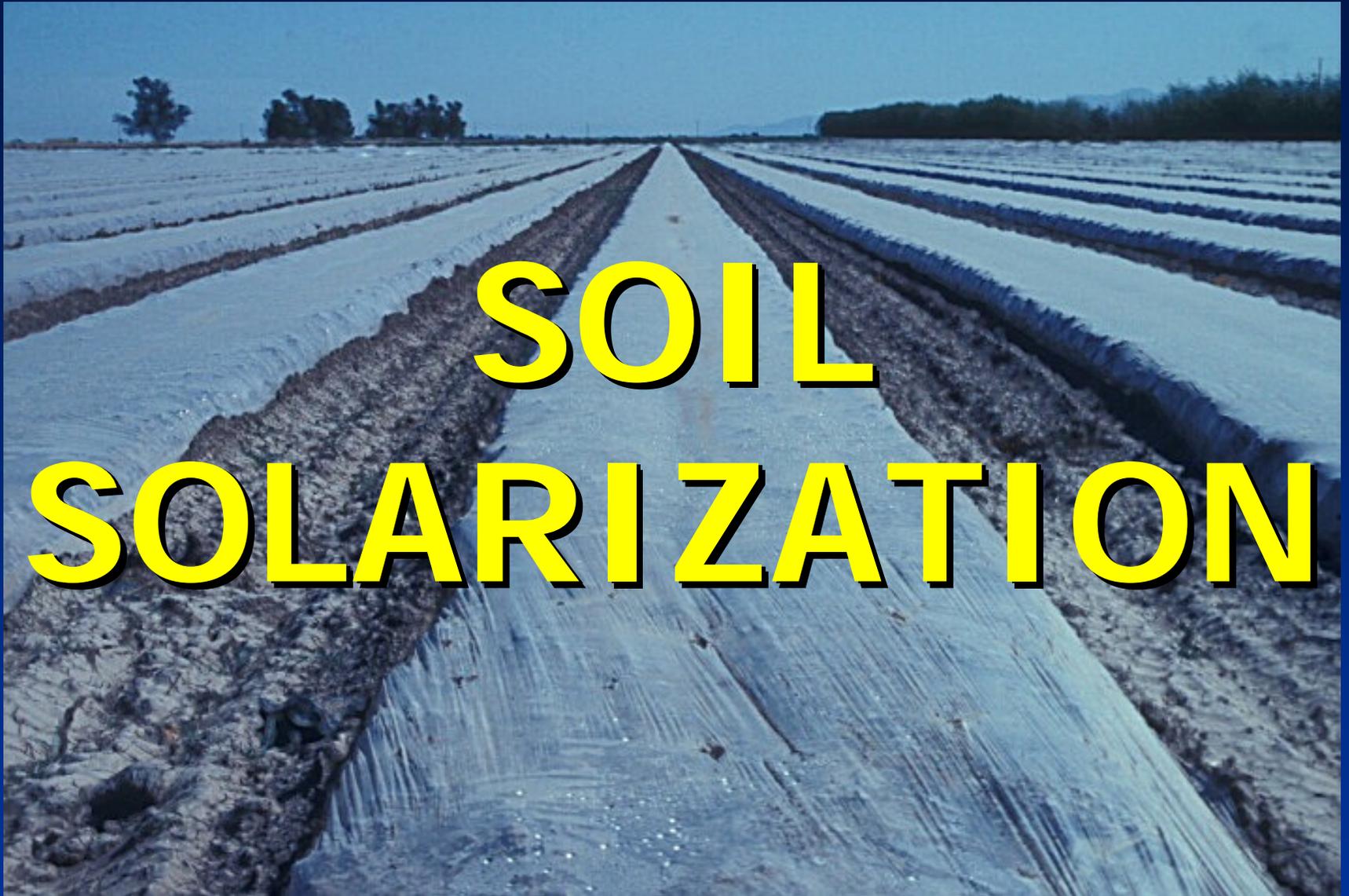
- Water/nutrient mgt.
 - **Avoidance**
- Tillage modifications
 - **Solarization**
- Biofumigation/Crop Rotation/Cover Crop
- **Reduced risk pesticides**

Biological Approaches:

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

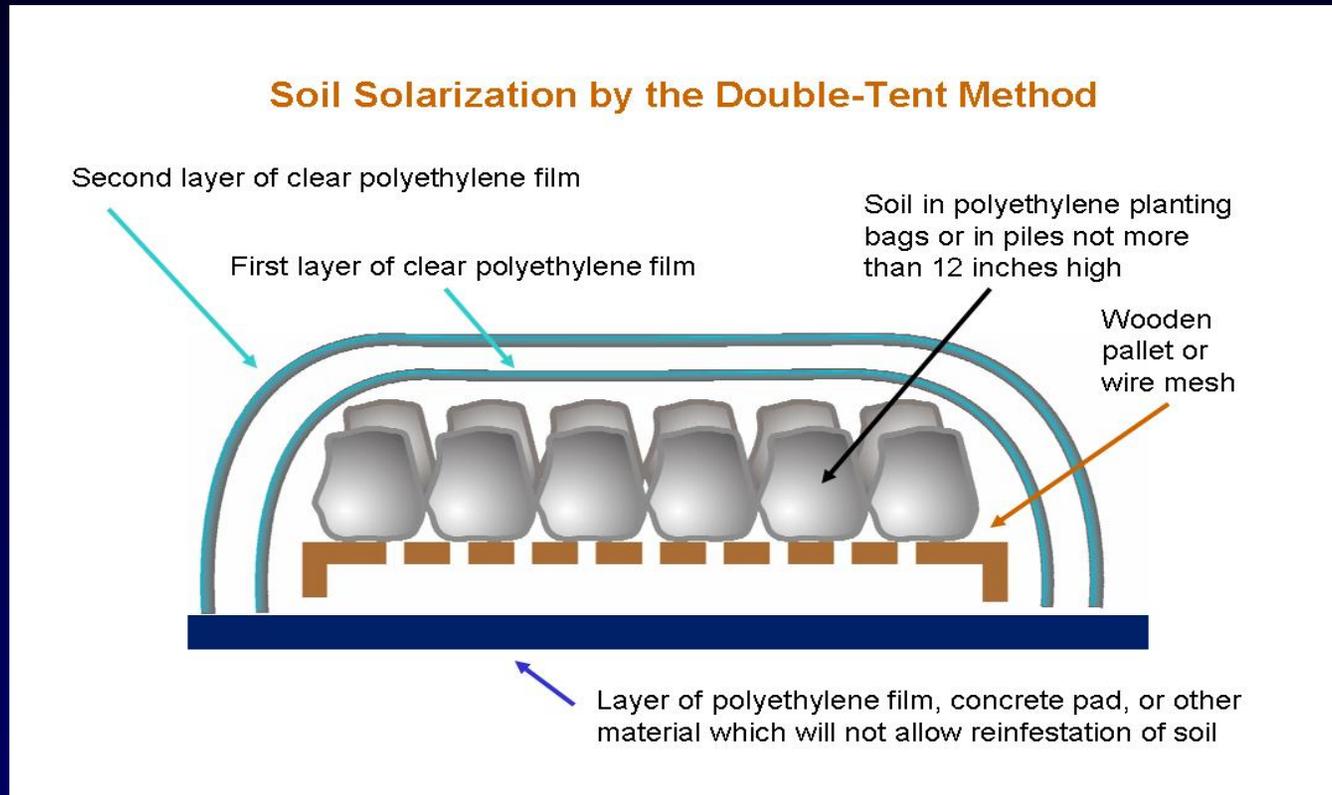
Several projects funded by UCIPM have explored soil treatment by:

- Solarization
- and
- Biofumigation



SOIL SOLARIZATION

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



Adapted from CDFA

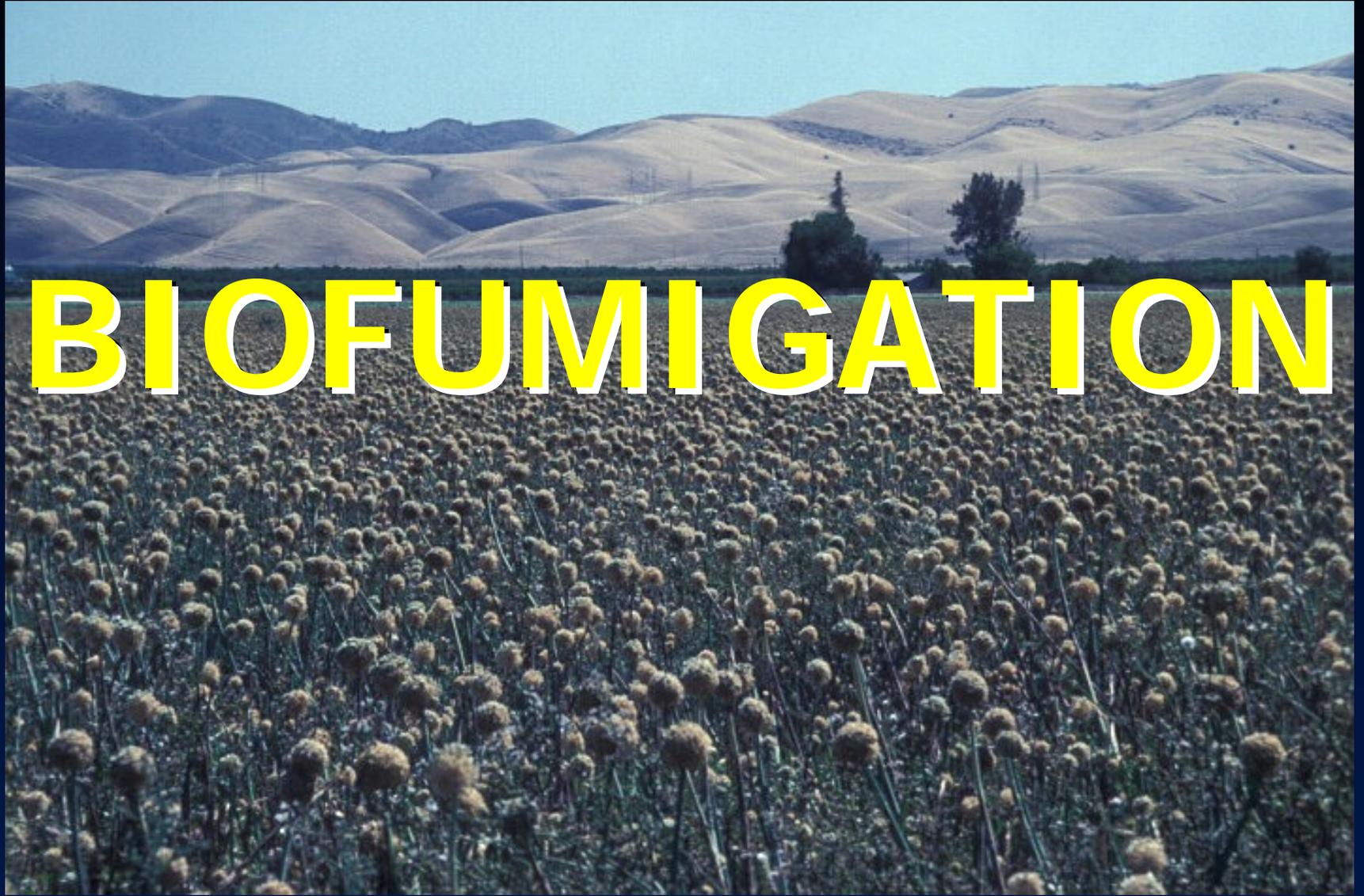
http://www.cdfa.ca.gov/phpps/pe/nipm_pdfs/nipm_7.pdf

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:

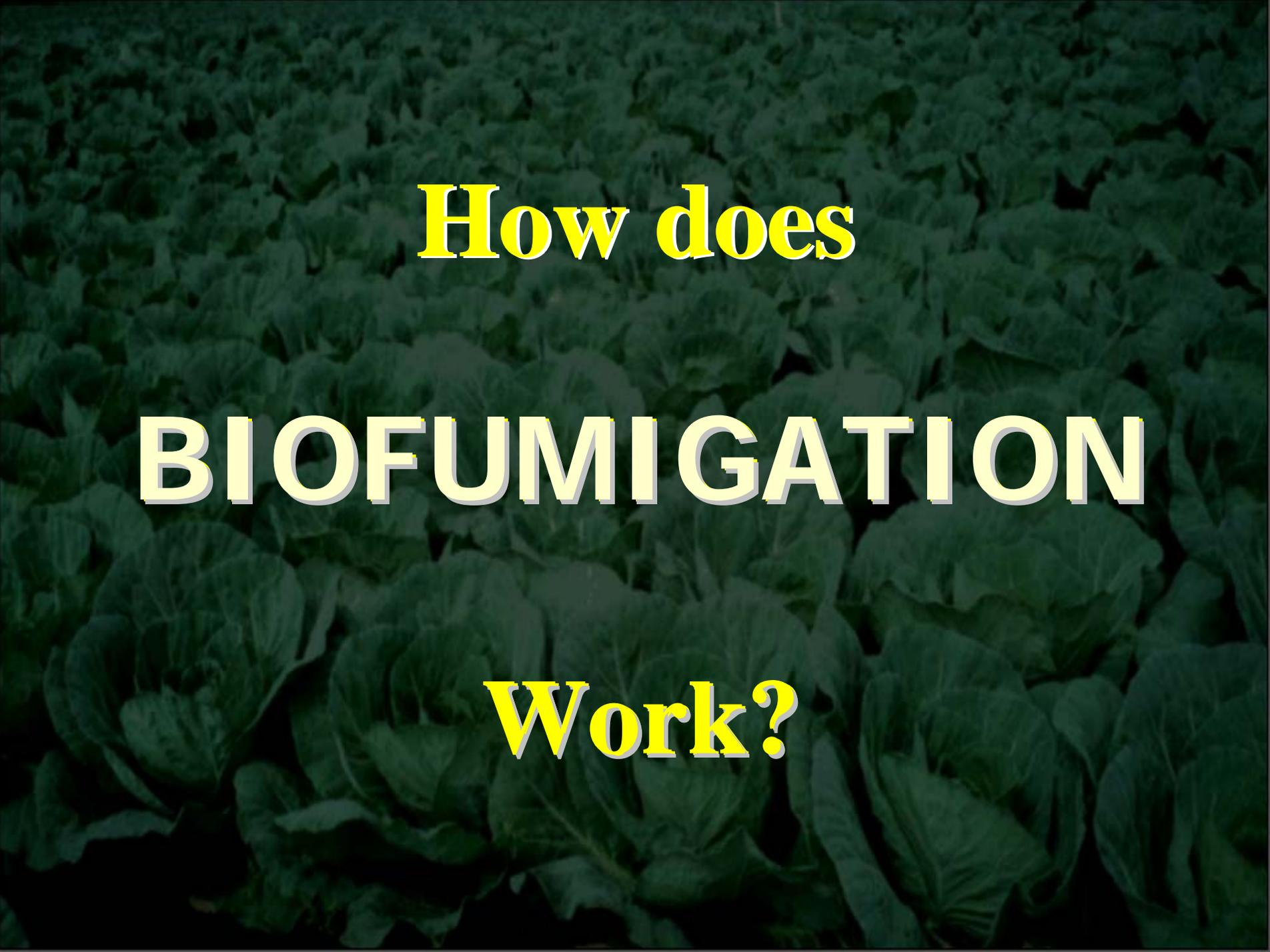
- * Polymer composition
 - * **Permeability**
 - * Durability
(multi-purpose?)
- * **Recycling/Disposal**



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

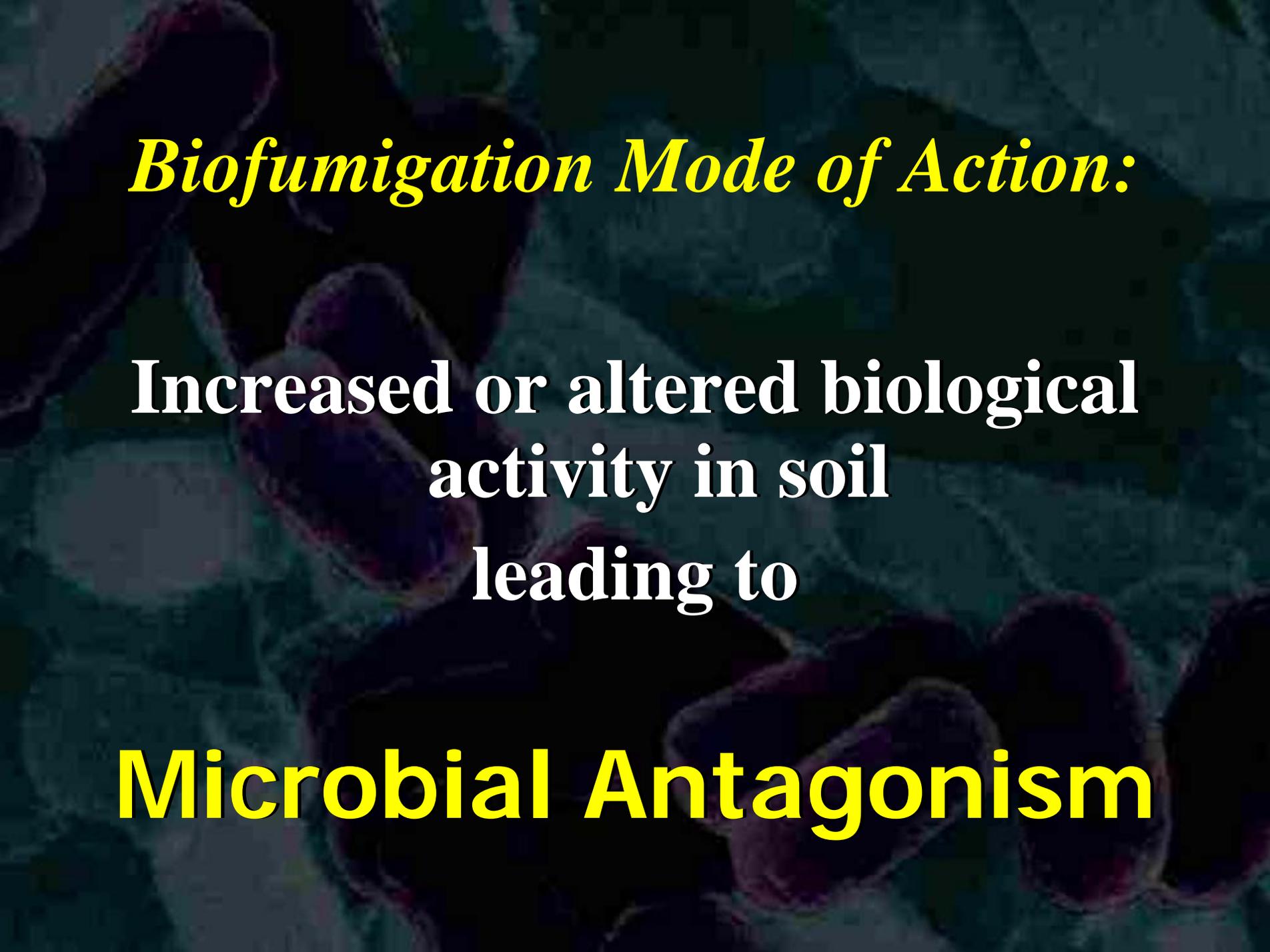
Work?

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

The background of the slide is a dark, blue-tinted microscopic image showing various soil organisms, including what appear to be elongated, segmented structures and smaller, more rounded forms, possibly representing microbial communities or soil fauna.

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 =

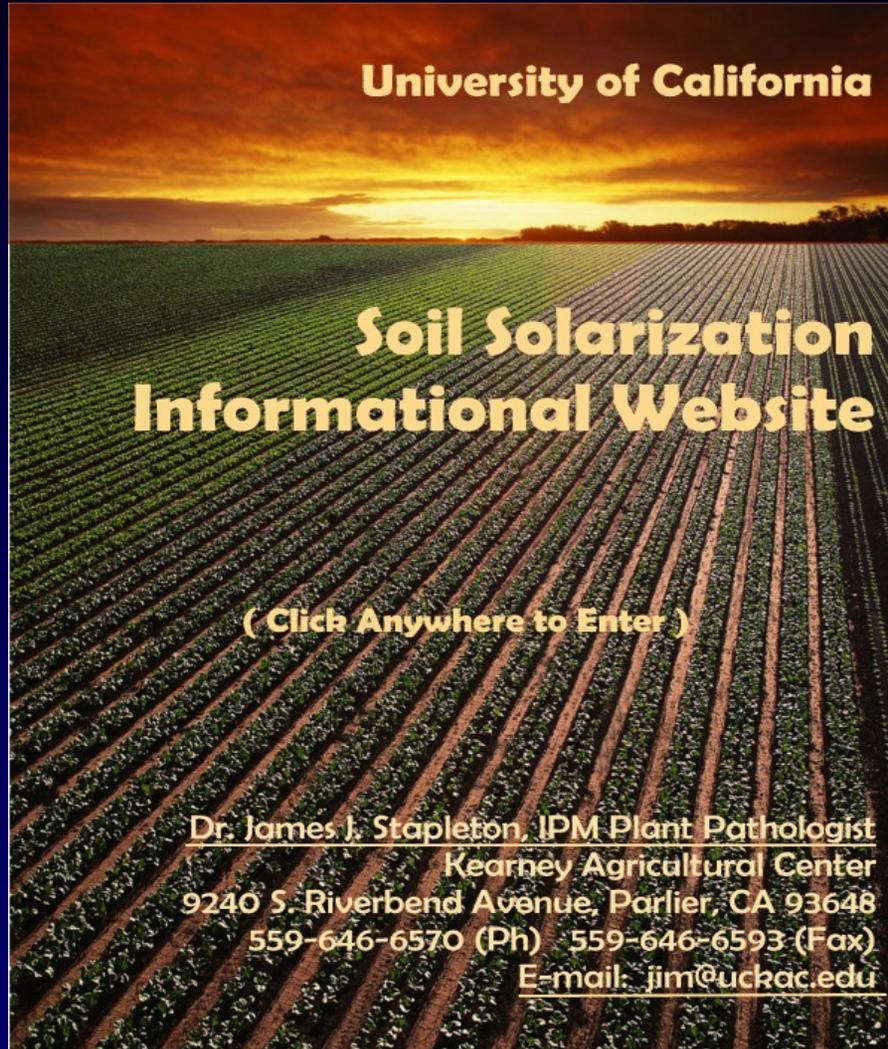
***INTEGRATED
MANAGEMENT***

References:

**UNIVERSITY OF CALIFORNIA
STATEWIDE IPM PROGRAM
WEBSITE:**

<http://ipm.ucdavis.edu>

<http://solar.uckac.edu>



University of California

**Soil Solarization
Informational Website**

(Click Anywhere to Enter)

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