Status of Soil Fumigants

Tom Hoffmann
WSDA Pesticide Management Division

Washington State Department of Agriculture

How We got Here
► Food Quality Protection Act of 1996
  • Pesticide registration must be reviewed at least once every 15 years.
  • Determine whether a pesticide continues to meet the FIFRA standard for registration.
► Pesticides registered before 1984 had not been reevaluated.
  • Reregistration is a comprehensive re-evaluation of pesticides first registered before 1984 using current science and risk assessment methods.
  • Goal of reregistration is to ensure pesticides, as labeled, will not cause unreasonable adverse effects.

How We got Here
► EPA completed the reregistration eligibility decision (RED) process for four soil fumigants in May 2009.
  • Chloropicrin
  • Dazomet
  • Metam sodium/potassium
  • Methyl bromide.
  • 1,3-Dichloropropene (Telone) – completed reregistration in 1998 and had a revised risk assessment completed in 2007.
How We got Here
► Amended REDs issued June 2009
  ● First time EPA conducted a comprehensive re-evaluation of these soil fumigants since registration
► Included measures to mitigate risks from soil fumigant
  ● REDs required use practices to mitigate risks to workers & bystanders from exposure to fumigants
► Measures implemented through product labels
► Revised labels implemented protections in 2010 and 2011

Mitigation Measures
► RUP classification for all soil fumigation products
► Required Good Agricultural Practices (GAPs)
► Rate reductions
► Dry disconnects
► Use site limitations (prior notification & monitoring)
► Pesticide handler respiratory protection
► Tarp perforation and removal restrictions
► Reentry restrictions
► Buffer zones
► Restrictions near difficult-to-evacuate sites
► Training information for workers
► Applicator training
► Fumigant Management Plans (FMPs)
► Post Application Summary (PAS)
► Outreach to first responders
► Emergency preparedness and response measures
► Registrant-provided training, information, and community outreach programs

Current Situation
► EPA moved the soil fumigants forward in Registration Review from 2017 to 2013.
  ● This will allow EPA to:
    ✫ consider new data and technologies sooner,
    ✫ determine whether mitigation measures included in the reregistration decision is effectively addressing the risk,
    ✫ include other soil fumigants not part of the last review.
USEPA anticipates that the full implementation of the risk mitigation measures will decrease the likelihood of accidents and errors, foster applicator planning and compliance, and assure appropriate response to exposures that occur.

Current Situation
► EPA must complete registration review by October 1, 2022.
► Registration Review Decision
  ● EPA’s determination whether a pesticide meets or does not meet statutory standard for registration.
  ● Can the pesticide can perform its intended function without unreasonable adverse effects on human health or the environment.

Draft Risk Assessment
● Human health & ecological risk (2018)

Proposed Interim Decision
● Proposes risk management decisions & revise risk assessments (late 2018)

Interim or Final Decision
● Label change information (2020)

Public Participation Process
Current Situation

What is known at this point

- Yu-Ting Guilaran, Director
  Pesticide Re-evaluation Division
  Office of Pesticide Programs, US EPA
- Dana Friedman, Fumigant Review Manager
  Pesticide Re-evaluation Division
  Office of Pesticide Programs, US EPA

- Teams have been meeting to begin the draft risk assessments.
- Currently, updates are not available in order to make decisions on modifications to mitigation measures.

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Fumigant | Trade Names | Registered | Nematodes | Pathogens | Weeds |
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Chloropicrin | NutraPic (Arystra) Strike 100CP (Tri-Est Ag) Telone C-35 (Trical) | X X X |
1,3-Dichloropropene | Cordon (Dow) Strike (Dow) Telone I (Dow) Telone Technical | X X X |
Chloropicrin + 1,3-d | Strike 60CP (Trident) Strike 80CP (Trident) Telone C-15 (Trical) | X X X |
Dazomet | Basamid G (AMVAC) | X X X |
Methyl bromide + Chloropicrin | MCB-33 (Trical) Termo-Gas 67 (Great Lakes) Termo-Gas 75 (Great Lakes) Termo-Gas 98 (Great Lakes) Tri-Con 33/67 (Trical) Tri-Con 45/65 (Trical) Tri-Con 50/50 (Trical) Tri-Con 57/43 (Trical) Tri-Con (Triform) 82/20 (Trical) | X X X X |
Dimethyl disulfide (DMDS) | Paladin (Arkema) Paladin EC (Arkema) | X X X |
DMDS + Chloropicrin | Paladin Pic-21 (Arkema) | X X X |
Allyl isothiocyanate (biopesticide) | Dominus (bega USA) Dominus 100 (bega USA) | X X X X |
Ethoprop | Mocap 15% Granular (AMVAC) Mocap EC (AMVAC) | X X |

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Systematic Synergism

Nematode management must mutually and reflexively consider

- Site preparation
- Soil condition during application (and at depth)
- Product selection and rate
- Spatial placement
- Method of application
- Soil sealing (shank disruption)
- Biofumigation
- Chemotaxis (chemo-attractant plants)
- Weed management
- Nutrient management
Very poor field preparation

Poor field preparation

Poor field preparation

Excessively dry soil
Nobel Blade or Sweep

Disrupt Shank Trace

Imants Spader

Rollers do not provide adequate soil surface seal
Other than methyl bromide, soil fumigants do not effectively reach all three pests in a single application.

**Weed Seeds**
- 0” – 4”

**Soil-borne Pathogens**
- 0” – 8”

**Nematodes**
- 0” – 48+”

**Volatileization ➔ Diffusion ➔ Dissipation**

Information provided by Kyle Coleman, TKI

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**Two-tier Shank**

Rumble 30 GPA @ 6 inches + 30 GPA @ 15 inches vs 40 GPA @ 6 inches + 20 GPA @ 15 inches, 400 readings (Echo, OR)

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Comparison - Vapor Pressure (20° C)

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<th>Material</th>
<th>mmHg</th>
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Summary

- Principle reason for ineffective control was poor field preparation.
- A secondary factor was poor soil condition at time of application.
- Shank trace disruption and soil surface seal are critical.
- Public comment period will occur in early 2019.
- Revised soil fumigant labels will enter the marketplace in 2020.

Thank You!