

**Methyl Bromide and Alternatives -
A Food Industry Perspective**

Heat Treatment Workshop

**Kansas State University
May 13, 2009**

Jim Bair

North American Millers' Association

About NAMA

48 member companies

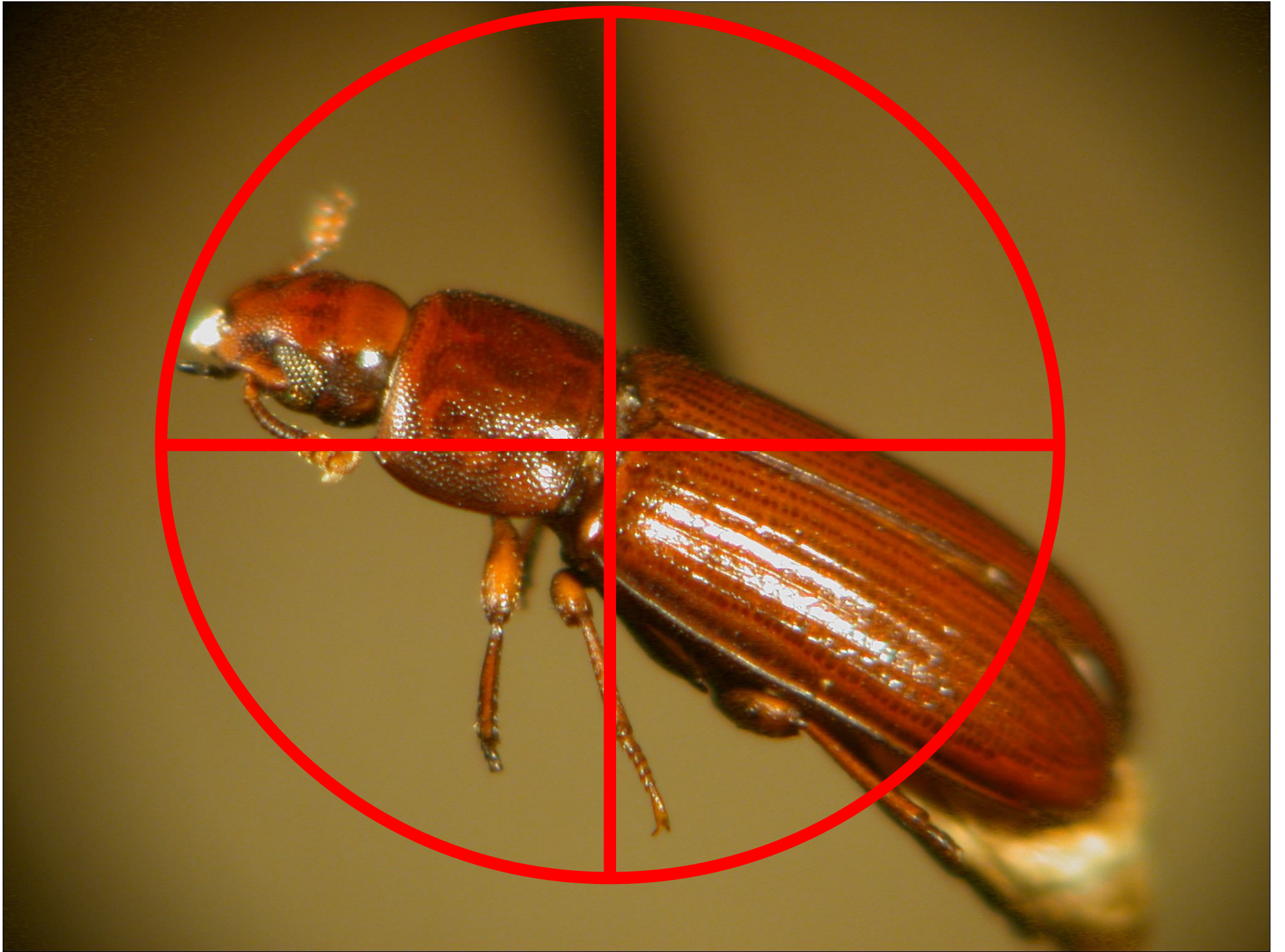
170 wheat, corn & oat mills

150 cities

38 states

**Production exceeds 160 million pounds
per day, > 95% of industry capacity**





Methyl Bromide Critical Use Exemption Process
2009 Methyl Bromide Usage Newer Numerical Index (BUNNI)
ALL SECTOR COMPREHENSIVE

SECTOR	2009 Applicant Request	EPA Preliminary Value	Combined Impacts & Transition Adjustments		Most Likely Impact Value	Research Amount	2009 NOMINATION	
	(kgs)	(kgs)	HIGH (kgs)	LOW (kgs)	(kgs)	(kgs)	(kgs)	
POST HARVEST	Commodities	151,420	73,721	58,901	58,901	58,901	20	58,921
	Ham	22,198	20,202	19,669	19,669	19,669	-	19,669
	Post Harvest Use - NPMA	181,210	181,210	117,779	117,779	117,779	-	117,779
	Structure - Food Processor	444,314	444,314	291,418	291,418	291,418	-	291,418
Fruits & Vegetables	Cucurbits	1,491,652	1,195,235	558,762	340,564	410,824	941	411,765
	Eggplant	140,584	139,666	72,743	57,422	62,356	433	62,789
	Peppers	1,916,951	1,840,399	961,360	695,309	780,977	2,844	783,821
	Strawberry Fruit	2,135,813	2,031,938	1,382,001	1,311,759	1,334,377	2,377	1,336,754
	Tomatoes	4,802,455	4,720,582	1,536,965	1,098,591	1,239,748	5,501	1,245,249
Nursery Propagative Material	Forest Seedlings	326,058	324,111	125,758	125,758	125,758	-	125,758
	Nursery Stock Fruit, Nut, Flower	52,433	52,433	43,776	43,776	43,776	1,506	45,282
	Orchard Replant	1,232,668	1,088,769	420,048	261,199	312,349	1,658	314,007
	Ornamentals	698,051	154,448	133,716	133,716	133,716	4,060	137,776
	Strawberry Nursery	44,315	44,314	8,383	8,383	8,383	454	8,837
	Sweet Potato Slips	18,144	18,144	18,144	18,144	18,144	-	18,144
	Turf	940,432	-	-	-	-	-	-
TOTAL	14,598,699	12,329,485	5,749,424	4,582,389	4,958,174	19,794	4,977,968	
(%) OF 1991 BASELINE	57.2%	48.3%	22.5%	18.0%	19.4%	0.1%	19.5%	
(%) OF 2009 REQUEST	100.0%	84.5%	39.4%	31.4%	34.0%	0.1%	34.1%	



1991 BASELINE 25,527,550 KILOGRAMS

LAST UPDATE: December 18, 2006

**2011 Methyl Bromide Usage Newer Numerical Index (BUNNI)
Transition Use Reduction Description Spreadsheet**

SECTOR		Quantity Requested for 2010:	Quantity Recommended by MBTOC/TEAP for 2010	Quantity Approved by Parties for 2010:	Quantity Required for 2011 Nomination:
POST HARVEST	Commodities	19,242	19,242	19,242	10,041
	Ham	4,465	4,465	4,465	3,730
	Post Harvest Use - NPMA	37,778	37,778	37,778	17,365
	Structure - Food Processor	191,993	173,023	173,023	135,299
Fruits & Vegetables	Cucurbits	323,773	286,324	286,324	218,032
	Eggplant	31,990	30,078	30,078	21,561
	Peppers	457,084	457,084	457,084	212,775
	Strawberry Fruit	1,103,422	1,007,477	1,007,477	1,023,471
	Tomatoes	728,457	728,457	728,457	336,191
Nursery Propagative Material	Forest Seedlings	120,853	117,826	117,826	106,043
	Nursery Stock Fruit, Nut, Flower	8,465	7,955	7,955	7,955
	Orchard Replant	226,020	215,800	215,800	203,591
	Ornamentals	92,499	82,318	82,318	70,178
	Strawberry Nursery	7,381	4,690	4,690	7,381
	Sweet Potato Slips	18,144	14,515	14,515	14,515
TOTAL		3,371,566	3,187,032	3,187,032	2,388,128
(%) OF 1991 BASELINE		13.2%	12.5%	12.5%	9.4%

1991 BASELINE

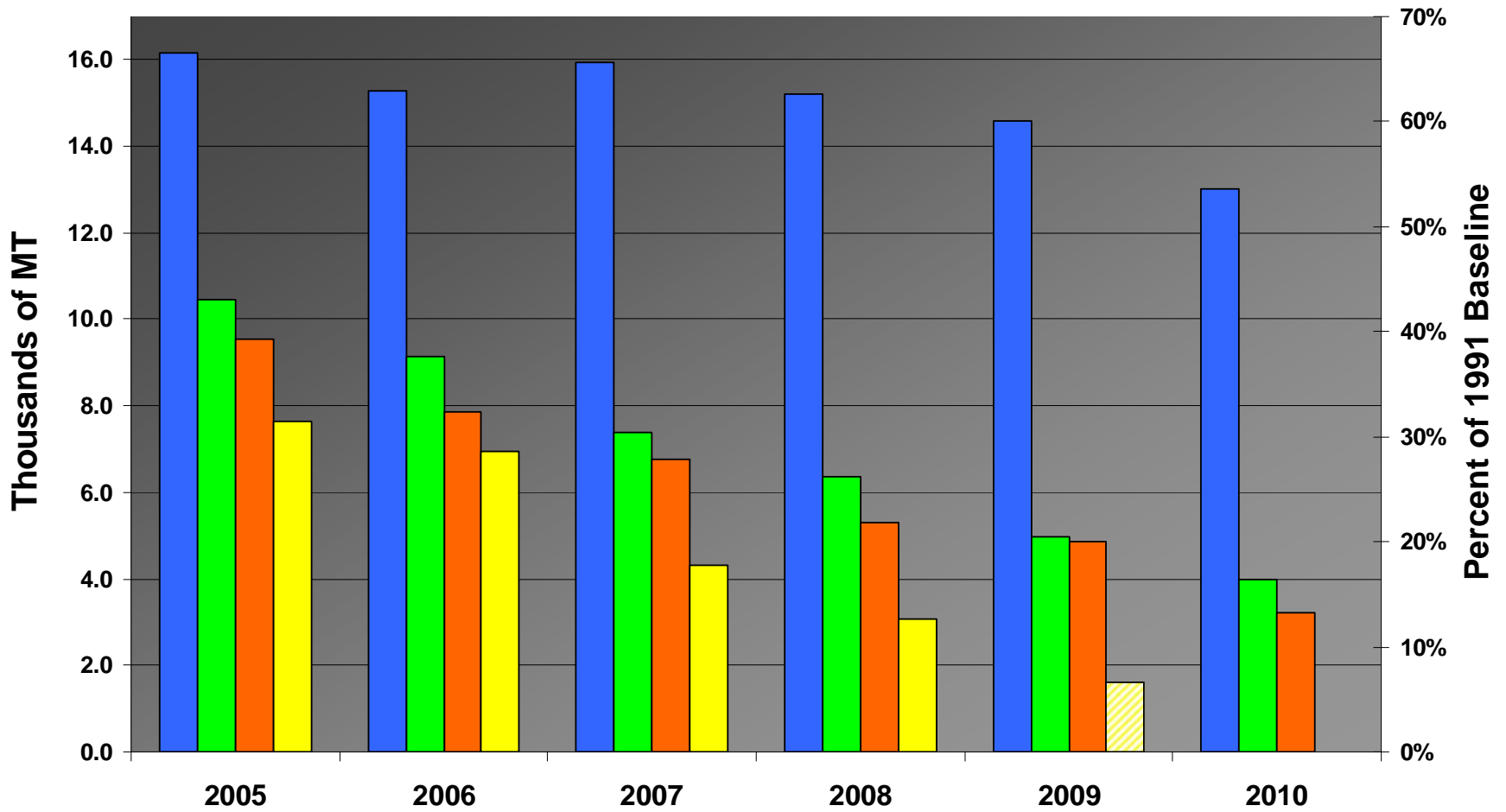
25,527,550

KILOGRAMS

**- 54% in
2 years**

CALENDAR YEAR	AMT. NOMINATED (percent of baseline)	AMT. AUTHORIZED (percent of baseline)
2005	39	37
<u>2006</u>	35	32
<u>2007</u>	29	26
<u>2008</u>	23	21
<u>2009</u>	19.5	16.7
<u>2010</u>	13.4	12.7
2011	9.4	Decided in November 2009

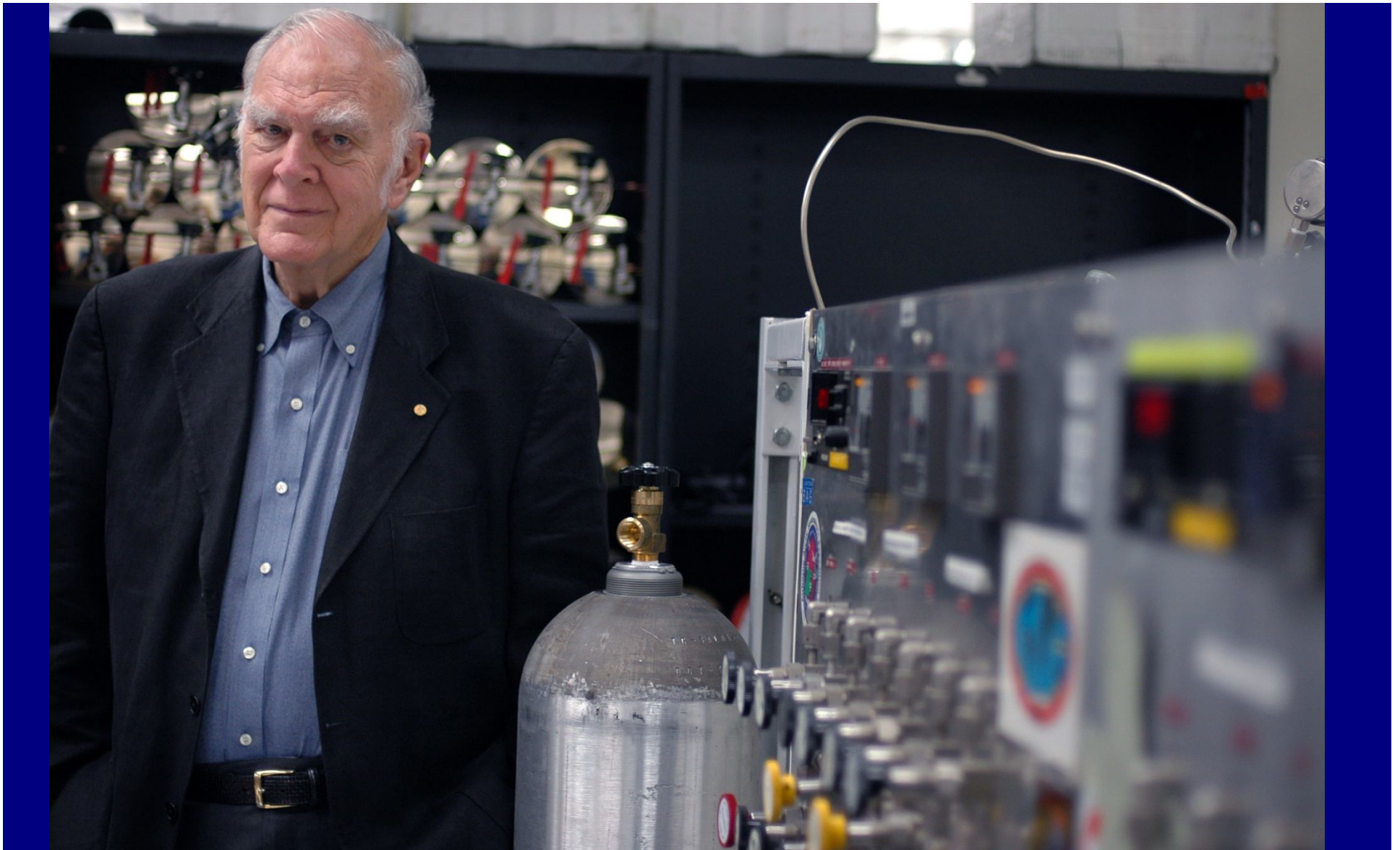
CUE Applications and Approvals



■ Grower Applications
 ■ EPA Nominations
 ■ Approved by MOP
 ■ EPA Production Allocation

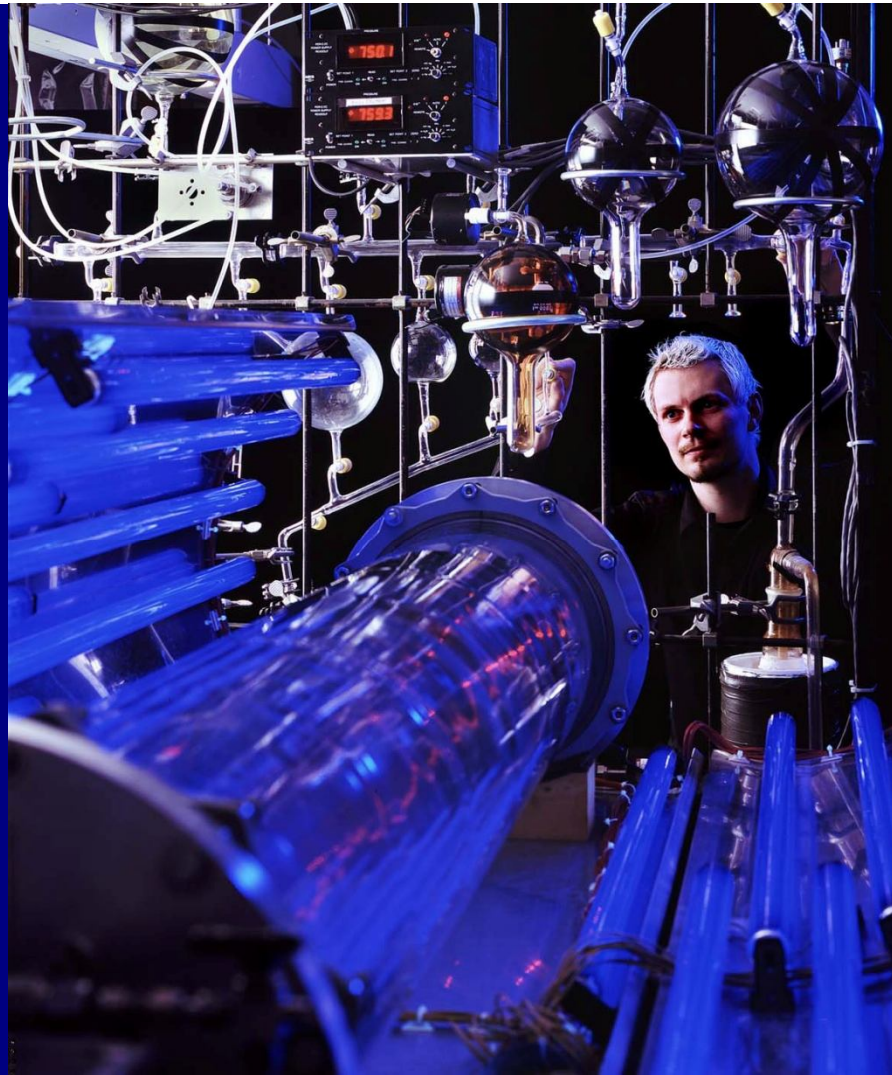
Accelerated Phaseout Schedule for Class I Substances

Date (Jan. 1)	CFCs	Halons	Carbon Tetrachloride	Methyl Chloroform	Methyl Bromide	HBFCs
1994	25%	0%	50%	50%	100%	100%
1995	25%	0%	15%	30%	100%	100%
1996	0%	0%	0%	0%	100%	0%
1997	0%	0%	0%	0%	100%	0%
1998	0%	0%	0%	0%	100%	0%
1999	0%	0%	0%	0%	75%	0%
2000	0%	0%	0%	0%	75%	0%
2001	0%	0%	0%	0%	50%	0%
2002	0%	0%	0%	0%	50%	0%
2003	0%	0%	0%	0%	30%	0%
2004	0%	0%	0%	0%	30%	0%
2005	0%	0%	0%	0%	0%	0%



Sherwood Rowland

University of California - Irvine



Mads Sulbaek Andersen

University of California - Irvine



Article




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Atmospheric Chemistry of Sulfuryl Fluoride: Reaction with OH Radicals, Cl Atoms and O₃, Atmospheric Lifetime, IR Spectrum, and Global Warming Potential

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Abstract

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Popular termite fumigant is also a greenhouse gas

2:00 PM, January 21, 2009

Sulfuryl Fluoride - Newly Discovered Greenhouse Gas Has 4800 Times The Warming Impact Of CO₂

By News Staff | March 10th 2009 12:00 AM | 1 comment | [Print](#) | [E-mail](#) | [Track Comments](#)

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Sulfuryl fluoride, a gas used for fumigation, has the potential to contribute significantly to future greenhouse warming, but because its production has not yet reached high levels there is still time to nip this potential contributor in the bud, according to an international team of researchers.

Their study of sulfuryl fluoride this month in the *Journal of Geophysical Research*, measured the levels of the gas in the atmosphere and determined its emissions and lifetime to help gauge its potential future effects on climate.

Sulfuryl fluoride was introduced as a replacement for methyl bromide, a widely used fumigant that is being phased out under the Montreal Protocol because of its ozone-destroying chemistry. Methyl bromide has been widely used for insect control in grain-storage facilities, and in intensive agriculture in arid lands where drip irrigation is combined with covering of the land with plastic sheets to control evaporation.

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Insect Fumigant Identified as Potent Greenhouse Gas

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CAMBRIDGE, Massachusetts, March 11, 2009 (ENS) - Sulfuryl fluoride, a gas used for insect control, has the potential to contribute to future global warming at more than 4,800 times the potency of the better known greenhouse gas carbon dioxide, an international team of researchers said today.

The Top Ten Greenhouse Gases

PopSci.com's guide to the vapors that are making Earth more toasty

Posted 3.17.09 at 1:43 pm

[2 Comments](#)



◀ **IMAGE 1 OF 10** ▶

10. Sulfuryl Fluoride

Termite tent, courtesy of [the Monterey Public Library](#) via Flickr.com

The new kid on the block, MIT scientists identified this chemical as a greenhouse gas on March 11th, 2009. Used as a fumigant, Dow Chemicals produces sulfuryl fluoride to kill termites. The chemical, which is highly inert, has a lifetime of up to 40 years, and traps 4,800 times more heat per molecule than CO₂. The chemical only exists in 1.5 parts per trillion in the atmosphere, but according to the recent *Journal of Geophysical Research*, that number is going up by 5 percent a year.

TAGS

[The Environment](#), [Carbon Dioxide](#), [Climate Change](#), [Global Warming](#), [Greenhouse Gases](#), [Hexafluoroethane](#), [Methane](#), [Nitrous Oxide](#), [Ozone](#), [Sulfur Hexafluoride](#), [Sulfuryl Fluoride](#), [Trichlorofluoromethane](#), [Trifluoromethane](#), [Water Vapor](#)

◀ **IMAGE 1 OF 10** ▶

Greenhouse Gas Emissions -

**What if all US mills were
fumigated with SF?**

Avg mill	1.0 million ft³
SF dosage	3.0 lbs/1000 ft³
GWP	4,800 lbs CO₂ equivalent (CO₂e)
Avg fum	14.4 million lbs CO₂e
400 fum/yr	5.8 billion lbs CO₂e
or	2.6 million metric tons

Carbon footprint **12,100 lbs CO₂/yr**
of one car (US EPA)

Total adoption of SF by milling industry
equivalent to adding 476,033 additional cars/yr

Mill	2.0 million ft³
SF dosage	3.0 lbs/1000 ft³
GWP	4,800 lbs CO₂e
1 fumigation	28.8 million lbs CO₂e
or	13,061 MT CO₂e
2 fum/yr	26,122 MT CO₂e



Pollution in Your Community

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Your Zip Code: 64120
Your Community: JACKSON County

Who Is Polluting Your Community?
Reported Environmental Releases from TRI Sources in 2002

Rank	Facility	City	Pounds
1	<u>SIBLEY GENERATING STATION</u>	SIBLEY	898,308
2	<u>CARGILL INC. SOYBEAN PROCESSING PLANT</u>	KANSAS CITY	200,000
3	<u>HAWTHORN GENERATING FACILITY</u>	KANSAS CITY	136,512
4	<u>BALL METAL BEVERAGE CONTAINER CORP.</u>	KANSAS CITY	70,823
5	<u>CITY OF INDEPENDENCE</u>	INDEPENDENCE	66,138
6	<u>HAVENS STEEL CO.</u>	KANSAS CITY	36,765
7	<u>BAYER CROPSCIENCE</u>	KANSAS CITY	28,242
8	<u>LAFARGE N.A.</u>	SUGAR CREEK	28,051
9	<u>AERO TRANSPORTATION PRODS. INC.</u>	INDEPENDENCE	15,166
10	<u>TIFFANY MARBLE INC.</u>	LEES SUMMIT	13,109

SCS-001

**Sustainable Agriculture Practice Standard
For Food, Fiber and Biofuel Crop Producers
and Agricultural Product Handlers and Processors**

**Draft National Standard for Trial Use
April 2007**

Leonardo Academy has approved the publication of this draft standard for trial use and comment. It is anticipated that within 36 months this draft standard will be revised as necessary and be filed with ANSI for approval as an ANSI Standard. For this reason distribution and use of this draft standard for trial use is limited to 36 months after its publication as an ANSI draft standard for trial use. Before the revised version of this draft standard for trial use can be submitted to ANSI for approval as an ANSI standard it must go through a public comment process. This Draft Standard is not an ANSI standard. Please direct any comments or suggestions for revisions to this draft standard to Michael Army, Leonardo Academy, 1526 Chandler Street, Madison, WI 53711, Email: michaelarmy@leonardoacademy.org, Attn: SCS-001



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Draft ANSI Sustainability Standard

- Equates best practices with organic
- Rejects biotechnology
- Requires organic processes vs. measuring results
- Sets carbon emission standards

<i>Environmental Sustainability</i>	<ul style="list-style-type: none">- Sustainable Crop Production- Resource Conservation & Energy Efficiency- Ecosystem Protection- Integrated Waste Management
<i>Social & Economic Sustainability</i>	<ul style="list-style-type: none">- Fair Labor Practices- Community Benefits
<i>Product Integrity</i>	<ul style="list-style-type: none">- Product Quality- Product Safety and Purity

1.1. Purpose

The purpose of the Standard is to establish a comprehensive framework and common set of environmental, social, and quality requirements by which to demonstrate that an agricultural product has been produced and handled in a sustainable manner, from soil preparation and seed planting through production, harvest, post-harvest handling, and distribution for sale.

14.2.1.2. Compliance Requirements for Other Contaminants (Edible Crops)

The Producer's agricultural product either shall comply with U.S. Food and Drug Administration [Norm. Ref. 8] or World Health Organization requirements, whichever is stricter, for metals, chemical contaminants, drug and chemical residues, and natural toxins.

A close-up photograph of golden wheat stalks against a blue sky with white clouds. The wheat is in sharp focus, showing the texture of the grain and the long awns. The sky is a deep blue with soft, white clouds. The overall mood is peaceful and natural.

thanks!
jbair@namamillers.org