The Effect of Basamid, Methyl Bromide and Methyl Iodide on Loblolly & Slash Pine Production and on Soil Fungi

Scott Enebak,
Dean McCraw
& Tom Starkey

School of Forestry & Wildlife Sciences, Auburn AL
Rayonier Regeneration Center, Glennville, GA

Why is this study important?

- **Small scale plots of alternatives to MBr have included Methyl Iodide (MI).**
- **MI similar properties to MBr; “silver bullet” to replace MBr.**
- **Need large production scale plots to look at seedling characteristics, weed, insect or disease control**

Methyl iodide, Iodomethane, MI

- Nursery Coop began testing this compound in 2001.
- MI has a boiling point of 42.5 C (108 F).
- The ease of handling a liquid (MI) over a gas (MBr) might increase worker safety and application methods.
- MI decomposes in light, thus shorter residence time in the atmosphere (a few days).
- MI is hydrolyzed in 50 to 100 days to CH3 and Iodine.
- No residue of MI remains on treated crops.
- In both laboratory and field trials, MI was equal to or better than MBr in controlling soil-borne pathogens.
- Not registered for use in the United States
- Cost of the material if produced on a larger scale is unknown.
- <u>WAS</u> on fast track for registration by EPA.

s1

What went into this study?

- **3 fumigants - Basamid, MBr & MI replicated 3 times in nursery sections.**
- **Two plastic types; HD, VIF.**
- **Basamid 490 lbs/acre (Nov 2004)**
- **MI:Chl (98:2) 150 lbs/acre (April 2005)**
- **MBr:Chl (98:2) 150 lbs/acre (April 2005)**
- **Sown to Loblolly and Slash pine**

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s1 Normal nursery practices were carried out

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Seedling characteristics by species and soil fumigation - 2005 Glennville, GA

	Loblolly Pine			Slash Pine		
	MB[1]	MI	BAS	MB	MI	BAS
Density (ft^2)	21.6	22.9	20.3	20.6	20.0	18.5
RCD (mm)	4.9 a	4.7 a	4.3 b	5.3	5.2	5.4
Height (cm)	32.0 a	31.0 a	23.6 b	30.4 a	30.3 a	27.1 b
Root Bio (g)	0.65	0.65	0.61	0.64	0.66	0.78
Shoot Bio (g)	4.3 a	4.2 a	3.3 b	5.0 a	5.3 a	5.9 b

[1] Letters within a row and species indicate significant differences at the 0.05 level.


MI
Basamid
2005

Hand weeding time and weed biomass by soil fumigation - 2005 Glennville, GA

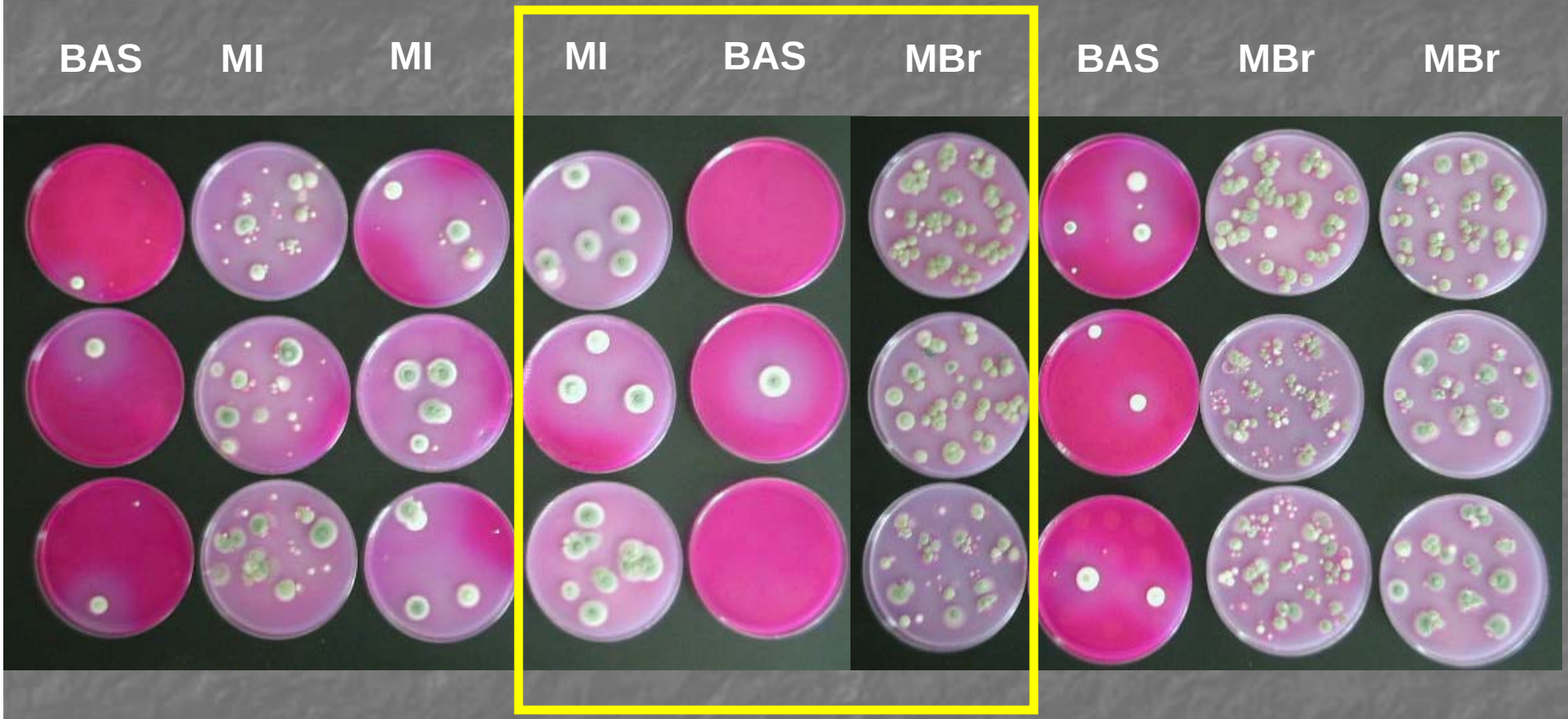
	Fumigation		
Weeds	BAS [1]	MB	MI
Weight (g/riser)[2]	12.0 a	14.0 a	20.9 b
Time (seconds/riser)	39.1 a	35.2 a	59. 3 b

[1]Letters within a row indicate significant differences at the 0.05 level.

[2] Riser = sections between sprinkler heads

s3

Year 1 - Trichoderma dilution plates 1 seedling crop & 11 months after fumigation, Glennville GA (10/05)



Block 1

Block 9

s3 starkte 6/26/2006

This is similar to whjat Bill had reported in a previous study

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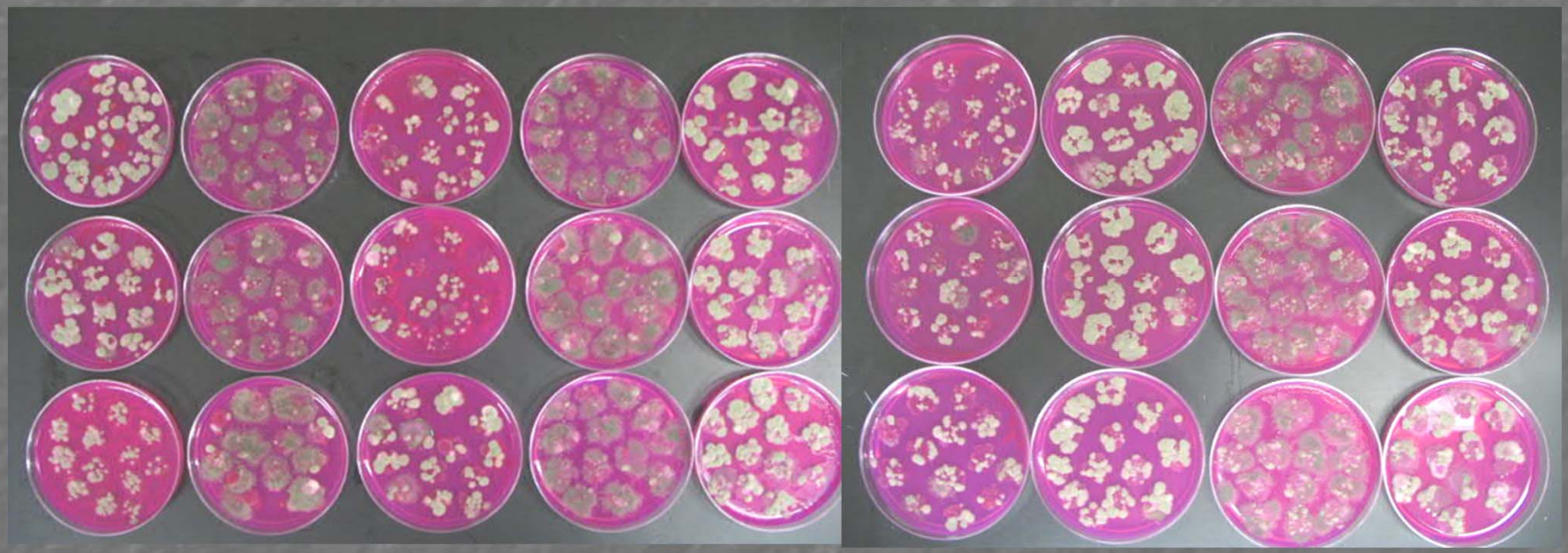
Soil borne Trichoderma populations by soil fumigation - 2005 Glennville, GA

	Fumigation		
Fungi	BAS[1]	MB	MI
Trichoderma spp.	15.3 b	155.6 a	32.6 b

[1] Letters within a row indicate significant differences at the 0.05 level.

s4

Year 2 - Trichoderma dilution plates 1 seedling crop & 18 months after fumigation, Glennville GA (5/06)



Block 1

Block 9

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s4 There were actually 4 plates per trt. Only 3 are shown so it is camparabe lto last year

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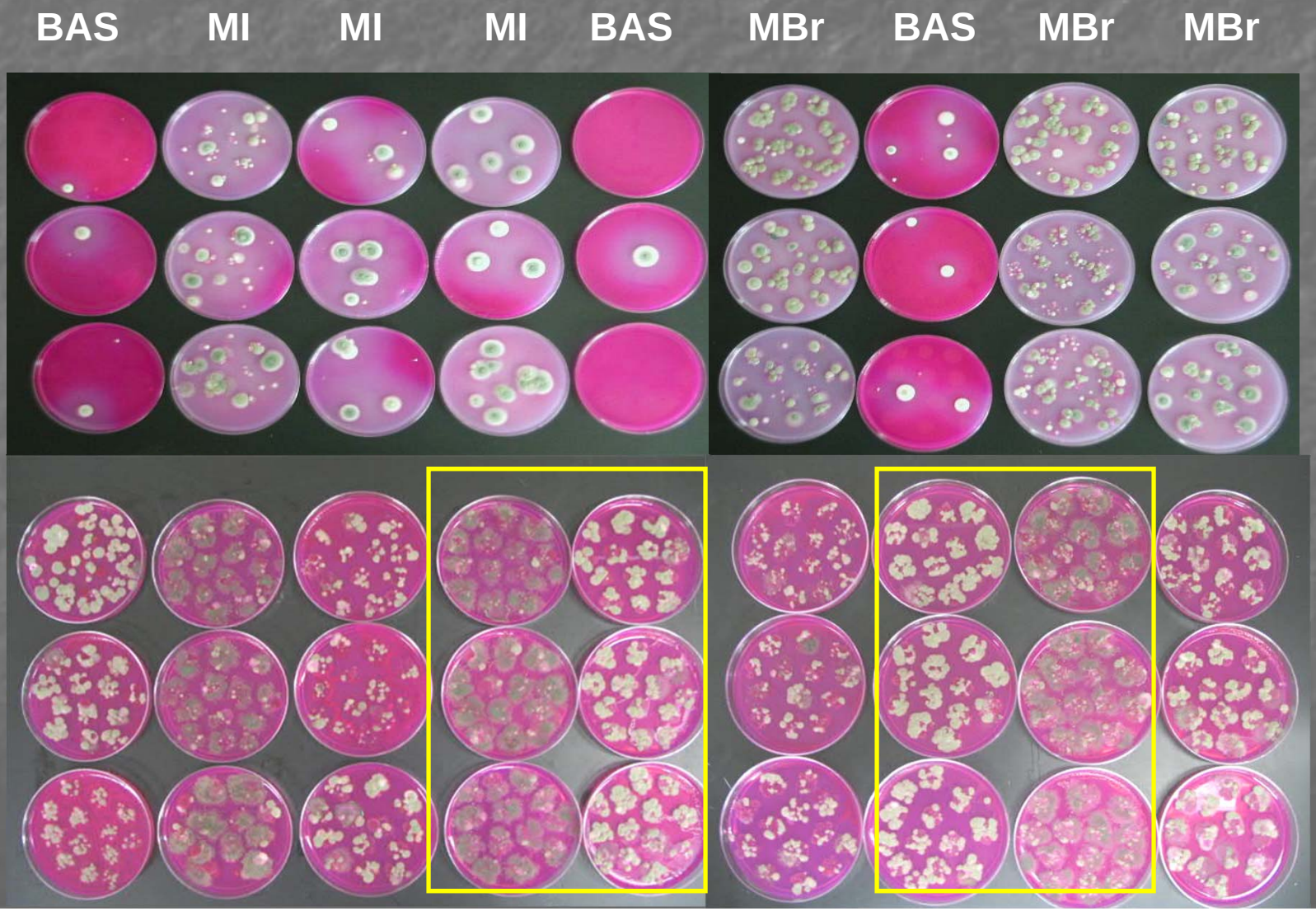
Year 1 & Year 2
Trichoderma dilution plates - Glennville GA



s2

The Effect of Type of Tarp on Number of Fungal Colonies (6/06)

Tarp	# of Colonies [1]
HD	131.4 a
VIF	115.2 b

[1] Numbers in column followed by the same letter are not significantly different at ¯= 0.05.

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s2

This slide is only for MB and MI. BAS did not have a tarp.

VIF does the best job of reducing colonies, VIF + MB would be the best combination since MB favors beneficial fungi.
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s5

The Effect of Fumigant Type on Number of Fungal Colonies (6/06)

Fumigant	# of Colonies 1
MB	140.2 a
BAS	142.6 a
MI	106.4 b

[1] Numbers in column followed by the same letter are not significantly different at ¯ = 0.05.

Slide 13

s5 Last year, Bas was almost 0 colonies. This year, big jump in fungi - but what type? As it turns out, it was a large jump in Penicilium sp. Not the most desirable

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s6

The Effect of Fumigant on Fungal Species (6/06)

	Penicillium sp.	*Trichoderma* sp.	Other	Total
MB	12.8 a	6.2 a	1.0 a	19.9 a
MI	10.9 b	9.0 a	1.2 a	21.1 a
BAS	13.0 a	1.3 b	1.2 a	15.5 b

[1] Numbers in column followed by the same letter are not significantly different at $\bar{}$ = 0.05.

Slide 14

s6 Important point - trichoderma is a much more desireable fungus in a nursery bed than Pen.

Tri was high last year - other 2 low - MB does not destroy the beneficial fungi.

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The Effect of Type of Tarp on Fungal Species (6/06)

	Penicillium sp.	*Trichoderma* sp.	Other	Total
HD	11.9 a	8.0 a	1.0 a	20.8 a
VIF	11.8 a	7.2 a	1.1 a	20.1 a

[1] Numbers in column followed by the same letter are not significantly different at ¯ = 0.05.

Summary - to date

- Basamid – sig. reduces both beneficial and other soil fungi – even after 18 months.
- Basamid seedlings were of a poorer quality after 1st year.
- MBr and MI encouraged colonization of Trichoderma fungi
- VIF tarping was more effective than HD in reducing fungal colonies – no difference in 1st yr seedling quality – not worth the hassle.

EPA Drops Plan to Approve Pesticide

By Marla Cone, Times Staff Writer
April 27, 2006

The U.S. Environmental Protection Agency has withdrawn its plan to approve a highly toxic fumigant for strawberries and other high-value crops after California officials, labor unions, environmentalists and others objected that nearby residents and farmworkers could be in danger.

The new pesticide, methyl iodide, is designed to replace methyl bromide, which is banned under an international treaty because it damages the Earth's ozone layer. Strawberry growers, concentrated mostly in Ventura and Santa Cruz counties, have been searching for nearly 15 years for a fumigant to replace methyl bromide, which they have been phasing out but are still using under exemptions granted by the United Nations. Facing criticism that it was substituting one dangerous chemical for another, the EPA decided not to register methyl iodide, also known as iodomethane. It will reevaluate the pesticide next year.

"EPA's refusal to automatically approve the use of another dangerous chemical as an alternative to methyl bromide is encouraging," said Susan Kegley, senior scientist at the environmental group Pesticide Action Network North America. "They didn't knock it out for good, but it's a good sign that they are holding off."

Yet to Come....

- Collect 2nd year weed data – July 2006
- Collect 2nd year seedling quality data and soil fungi samples – Fall 2006
- Collect 3rd year soil samples to evaluate Trichoderma levels
- 3rd year seedling data ???????