USDA-ARS MBr Alternative Area-Wide Project-South Atlantic Region: Forest Tree Nurseries: A 5-yr Summary

Objective: To evaluate the effects of a number of MBr alternatives in large demonstration plots that had previously shown promise in small-scale plots on:

- Loblolly pine production
- Soil-borne fungi
- Weed control
- Plant parasitic nematodes

USDA-ARS South Atlantic Area-wide Trials: 2007-2012

MBr Alternative	Components	Rate (lb/acre)	Plastic	# of Trials
Chloropicrin	100% Chloropicrin	100, 150, 200, 250, 300	HDPE, LDPE, VIF, TIF	8
Pic +®	85% Chloropicrin & 15% solvent A	100, 150, 200, 250, 300	HDPE, LDPE, VIF, TIF	8
Chlor 60	60% Chloropicrin & 40% 1,3 D	100, 150, 200, 250, 400	HDPE, LDPE, VIF, TIF	8
DMDS & Chlor (Paladin®)	79% DMDS & 21% Chloropicrin	70 (gal/acre)	HDPE	6
New Pic +	85% Chloropicrin & 15% solvent B	300	HDPE	2
Midas® 98/2	98% methyl iodide & 2% Chloropicrin	100	VIF	1
Midas® 50/50	50% methyl iodide & 50% Chloropicrin	160	VIF	1

Methodology

- MBr alternatives tested in six different nurseries.
- Trials spanned 2-3 year growing cycles.
- Randomized complete block design with 4 replications.
- Data collected in each nursery included the following:

Data	**# Times per season**	**Timing**
Seedling density	3	post-sowing/mid-summer/lifting
Trichoderma	2	post-sowing/lifting
Nematodes	2	post-sowing/lifting
Seedling dry weight	1	lifting
Root collar diameter	1	lifting
Height	1	lifting
Root morphology*	1	lifting

*root length, root diameter, root volume, and number of root tips

Comments on MBr Alternatives

Midas®

methyl iodide & chloropicrin

Pulled off the US Market.

New Pic +

(85% chloropicrin & 15% solvent B)

- New solvent in this formulation.
- It did not control annual sedge and was dropped from further testing.

Chlor 60

60% chloropicrin & 40% 1,3 dichloropropene

- This alternative has performed comparatively well to MBr in our trials.
- Nutsedge control is lacking.
- Nursery managers may choose this alternative if they have a nematode problem and nutsedge is not an issue.

Top 4 MBr Alternatives

1. Pic +® 85% chloropicrin & 15% solvent A
2. Chloropicrin : 100% chloropicrin
3. Paladin® : 79% dimethyl disulfide & 21% chloropicrin
4. TES-3?

Based on:

- Seedling quality data, root morphology, *Trichoderma* levels and no excessive nematode or weed problems.
- Using VIF and TIF

Notes:

- The unpleasant odor of DMDS in Paladin®and TES-3 may limit its acceptance as a MBr alternative by some nursery managers.

Management Implications

- We have identified some alternatives that act as decent pesticides and produce quality seedlings.
- Any choice of current alternatives will likely require an increased use of pesticides to compensate for alternative short falls.
- The long term effects of the best alternatives are unknown.
- An alternative that works well in one nursery may not be as effective in another nursery.

Management Implications

- A good starting point with high barrier plastics (TIF & VIF) in broadcast applications has been important.
  - (Rate with VIF/TIF) = $\frac{\text{(Old Rate under HDPE/LDPE)}}{2}$
- A alternative becomes more effective when chloropicrin (>20%) is included.
  - DMDS vs. DMDS & Chloropicrin (Paladin®)
  - Telone vs. Telone & Chloropicrin (Chlor60)


Questions?