Southern Forest Nursery Management Cooperative

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Membership
- The States of
  - Arkansas
  - Georgia
  - Louisiana
  - North Carolina
  - Oklahoma
  - South Carolina
  - Tennessee
  - Texas
  - Virginia
- Forest Industry
  - Plum Creek Timber
  - Rayonier
  - Smurfit-Stone Container
  - Weyerhaeuser
- Non-Industrial – Private
  - ArborGen
  - Joshua Timberlands
- U.S. Forest Service

Ms. Andrea Carone
Chemical Review Manager, Office of Pesticide Programs (7502P)
US Environmental Protection Agency
1200 Pennsylvania Avenue, N. W.
Washington, D.C. 20460

Re: Forest Tree Nursery Comments for risk mitigation options being considered for soil fumigants: methyl bromide and chloropicrin

EPA-HQ-OPP-2007-0350 & EPA-HQ-OPP-2005-0123

September 22, 2008

Dear Andrea Carone:

I am writing today in response to the Risk Mitigation Rules published on July 17, 2008 and the future production potential of seedlings for renewing our forests here in the southeastern United States. In this letter I will provide feedback from a recent survey of the members within the Nursery Cooperative which grow over 80% of all the trees for reforestation in the United States. I am the Director of a research Cooperative based out of Auburn University that coordinates and conducts research on the growing, cultivating and production of forest seedlings throughout the southern United States. We have been in existence since 1970.

Since the early 1990s, private, federal, state and industrial forestry organizations have funded research seeking a replacement for methyl bromide in response to the Montreal Protocol. Under the umbrella research arm of the Nursery Cooperative, we now have tested a number of alternative fumigants. To date, chloropicrin-based fumigants have been the most promising with respect to soil-borne pathogen control, but to a lesser extent, nutsedge. The other compounds tested (dazomet, metam sodium, 1, 3-D) do not give the pest control and the quality seedling the customers demand. There are no other registered fumigants that provide a reliable (year after year after year), cost effective alternative to methyl bromide fumigation for pest control and seedling production. Limiting fumigant use by placing overly restrictive limits on their use will affect their ability to produce seedlings. In addition, the availability of economical, high quality pest-free nursery seedlings will have a direct affect on both reforestation and afforestation programs in throughout the southern United States. Having access to cost effective, pest-reducing soil fumigants is essential for forest tree nurseries throughout the southern United States.

The forest tree nurseries produce over a billion seedlings annually (McNabb 2005, 2006, 2007) which are used for wildlife, recreation, pulp and paper, endangered species, carbon sequestration and perhaps as an

alternate fuel source. Imposing buffer zones, limiting areas of fumigation, moving residents from the area will literally force nurseries to consider shutting down operations. In my comments to your office concerning Buffer Zones (Dated August 9, 2007; EPA-OPP-2007-0350-0094, I reported that :

"A significant (80-100%) reduction of seedling production and the closing and shutdown of nurseries with the loss of employment and reforestation programs. Forestry and the Forest-Industry is the largest employer in the State of directly supporting over 43,000 jobs with more than $5.7 billion of sales resulting from timber-based manufacturing (Alabama Forestry Commission - Annual Report 2004).

Nothing has changed since the last comment period and the Risk Mitigation Rules published in July 2008. A current survey of our member nurseries (80% return rate) is copied below in Table 1. The most important factor in these new rules are the Buffer Zones and how they can continue to operate and produce forest-tree seedlings in the southern United States.

From these data in Table 1, 7 nurseries indicate they will close within 2 years; 9 more nurseries indicate a better than 50% chance of closing within 2 years. Other nurseries, in time, may be deemed by their company to no longer be an economically feasible operation due to the loss of the production areas. Those nurseries that remain in business will have significantly higher costs (hundreds of thousands of dollars per year) and a reduction in seedling production. At a minimum, seedling costs will triple (at the current production levels) which will have a cascading affect across the United States with respect to reforestation of forest lands. An important economical consideration is that forest seedling production is an integral part of a vertical forest products industry that permeates through the marketplace increasing in value as the seedling/tree matures. In this production system, the seedling is not the end product, it is just the beginning and affects the States' economy. The value of the forest industry for each of the Nursery Cooperative members in the Southern United States is show in Table 2.

Smaller Buffers – Neither practical, possible nor economical.

The buffer restrictions are of great concern to the forest nursery industry (Table 1). Forest tree nurseries cannot simply reduce buffer zones distances by putting in smaller fumigation blocks. Over 50 years of soil fumigation has proven this time and time again. The inability to split blocks into smaller and smaller blocks has been stressed in letters to EPA with meetings with EPA officials (Dr. Debbie Edwards) in Washington DC (February 2006) and with EPA officials in Fort Myers, FL (June 2007) on forest nursery field visits (October 2007 – Andrea Carone and others; EPA-HQ-OPP-2007-0350-0020 and -0094, EPA-HQ-OPP-2006-0025.1; EPA-HQ-OPP-2005-0125-0140). The average amount of fumigation in a nursery is 15 acres per year, per fumigation. Some nurseries fumigate more acres, some nurseries fumigate less acres. The range is 5- 40 acres per year. Using the current rates of MBr/Chloropicrin (350 lbs 67/33, or 400 lbs 98/2) or 300 lbs chloropicrin alone, the buffer zones range from 625 - 1000 ft to 900-1300 ft MBr/chloropicrin and chloropicrin alone, respectively. We ask that EPA to re-address the buffer zone distances again.

One cannot stress enough about the short biological window in the fall or spring when soil moisture, texture and temperature is optimum for a proper and efficacious fumigation. There is a 4-6 week period in the fall and even a shorter period in the spring when all of these factors align for a proper soil

fumigation. Nurseries cannot prepare the nursery soil for fumigation, treat 5 acres with soil fumigation, wait the necessary 5 days, fumigate the next 5 acres, wait the necessary 5 days and then fumigate the remaining 5 acres. By attempting to operate under the Risk Mitigation rules, a fumigation period, that would normally take 1 day to complete, would take at least 3 weeks to complete. After personally working and conducting research within forest tree nurseries since 1985, one can begin to get a sense of when and what makes a good soil fumigation. During that 3-week time period, either in the fall or the spring, the soil conditions, temperature, moisture, texture, are no longer acceptable or within recommended fumigation guidelines. One cannot sit in an office and force biology, weather, or soil conditions into a Matrix Table. We ask that EPA take into consideration the biological aspects (soil moisture, structure, temperature, organic matter, etc) that are necessary for efficacious soil fumigation.

Soil Fumigation Rates – They are what they are

After 50 years of operational work throughout the southern United States, the standard rate of soil fumigation is 350 lbs 67/33 to 400 lbs 98/2, (MBr/Chloropicrin) or more recently, 300 -350 lbs of chloropicrin. Nurseries do not use soil fumigants because they want to; they use soil fumigants because they have to. The effect of not using soil fumigants is a closure of the nursery due to weeds, nematodes and soil-borne fungi. The tangible affects of using soil fumigants is larger, more healthy seedlings, fewer weeds, less disease and less pesticides (ai) used per acre (Table 3). Using anything more than the above rates is wasting money and fumigants, and using anything less than the above rates is wasting money and fumigants. Using more than the current rate doesn't make the fumigant more effective and using anything less than the current rate results in pest problems (weeds, soil-borne pathogens, nematodes and insects). The Southern Forest Nursery Management Cooperative has been recommending to its membership (in response to the Montreal Protocol and the Phase out of Methyl Bromide) to use 300-350 lbs of chloropicrin under a plastic tarp since 1991 (Cram et. al. 2007, Enebak, et al 1990, South et. al. 2000, South 2005). EPA has the forest-tree seedling rate of chloropicrin at 135 lbs per acre in their RED (EPA-HQ-OPP-2007-0350). Thus, all projected buffer zone distances (Page 42) are incorrect and underestimate the effects of these rules on using chloropicrin as an alternative to methyl bromide. We ask EPA to re-address the fumigant rates, especially chloropicrin levels in forest nurseries.

Credits – Organic Matter, Clay Content and Tarps.

Organic Matter: There are very few, if any forest-tree nurseries in the Southern United States that has an organic matter contact greater than 2%, let alone 3%. The average of 45 forest-tree nurseries over 5 years has an organic matter content of 1.4%. Fumigation efficacy works best with lower amounts of organic matter in the soil as higher organic matter ties up the fumigants and decreases their effectiveness. Decreasing soil fumigant effectiveness is a waste of money and fumigants. Nursery seedling producers go to great lengths to ensure low amounts of organic matter when it comes time to fumigate their soils. Thus, there is no incentive by forest-tree seedling producers to get this credit, especially if increasing organic matter decreases fumigation efficacy– high organic matter defeats the purpose of fumigation altogether.

Clay Content: There is not a single forest-tree nursery in the Southern United States that has a clay content higher than 27%. Actually, it is very difficult, if not impossible for a forest-tree nursery to

operate/produce seedlings in soils with that much clay in their soils. The highest clay content in a member nursery was 25%, and it is no longer in business. At best, this now closed nursery worked on a 1:1 rotation (1 year of crop, 1 year fallow) because the soil structure and operating conditions was limited to the high clay content. Those early nurseries (initiated in the late 1950's) with high clay contents (>25%) are long gone and closed due to disease, insect and weed problems and ineffectual fumigation. The average (45 nurseries over a 5-yr period) clay content in currently operated nurseries is 11% . This level of clay is desired by seedling producers for the same reason as low organic matter: fumigation doesn't work as well in heavy, clay soils.

Tarps: There is not a single applicator, supplier, producer, manufacturer in the United States that can "glue" two sheets of VIF/TIF together in a broadcast system used in forest-tree nurseries. Despite being informed by MeBTOC and EPA since 2003 of such a system in Europe (I've been told Italy, France and Germany), no one at EPA nor MeBTOC has come forward with a name, supplier, manufacturer in these said countries that can effectively glue two sheets of VIF or TIF together. I have read reports from the Oregon Nursery Cooperative that the latest attempts to glue VIF failed, the plastic fell apart and blew away in the wind, and took twice as long to remove from the field. (WA DNR Comments to EPA). Offering a credit for something that doesn't exist to forest-seedling producers to reduce buffer zones is disingenuous. We ask that EPA consider the technical limitations and operations under the broadcast fumigation system used by forest-tree nurseries needed to actually use these credits.

Buffer Zones: Posting & Notification. Eighty-eight percent (22/25) nurseries who responded do not control the land beyond their nursery production areas. Buffer zones distances outlined in Matrix Tables (rates and acreages currently used by nurseries) will necessitate buffer zones being posted on non-controlled land. Nurseries will not be able to split blocks for multiple applications (see paragraph above) and thus buffer zones will fall onto non-controlled land. Nurseries will not get permission to use non-controlled land for posting purposes. Nurseries will take large areas of land out of seedling production to make sure buffers remain on nursery controlled land. Seedling production will significantly decrease. Forest tree nurseries will shut their operations.

Buffer Zones: Monitoring

We have been informed by growers and applicators that the likely impact of the monitoring would be significant. For example, "best guess" for forest nursery to implement the monitoring alone is going to add to over $2,000-$3,000 per fumigation. The notification of the public and other procedures is not a viable Risk Mitigation solution and would only serve to increase public false "exposures."

If I can be of further assistance to answer any questions you may have concerning Risk Mitigation and its affect on forest seedling production, please do not hesitate to contact me at the number listed above.

Sincerely;

Scott Enebak

Dr. Scott Enebak – Director
Southern Forest Nursery Management Cooperative

Table 1. Affects of Risk Mitigation Rules on Current Forest Seedling Nursery Production in the Southern US.

Nursery No.	State	Proximity to Neighbors	Increase in Annual Cost	Percent impact on Production	Greatest Impact
1	A	Public Road, Several Residences	$500,000	Significant	Buffer Zones
2	B	Nursery Buildings	$600,000	Significant (75%)	Buffer Zones
3	C	8 residences & Nursery Buildings	?	Moderate (25%)	Buffer Zones
4	A	3 residences	$150,000	Moderate (30%)	Buffer Zones/Multiple fumigations/ Buffer
5	D	4 residences, 2 office buildings, private land	$600,000	Significant	Zones/Monitoring/Notification of Neighbors
6	E	Nursery Buildings / Public Roads	?	Moderate (25%)	Cost of fumigation due to monitoring / Buffers
7	F	12 Residences / Nursery Buildings / Public Roads	?	Moderate (30%)	Buffer Zone Regulations / Notification of Neighbors
8	G	Office Buildings	?	?	Cost of fumigation due to monitoring / Buffers
9	H	Office Buildings		Moderate (15%)	Cost of fumigation due to monitoring / Buffers
10	B	Office Buildings/Residences/Public Road		Moderate (45%)	Buffer Zone Regulations / Notification of Neighbors
11	E				
12	K				
13	F	Office Buildings	Double	Significant (75%)	Buffer Zones
14	F	1 residence and Office Buildings	?	Significant (75%)	Buffer Zones/Monitoring Costs/Applicator availability
15	I	2 residences, Office Buildings	Double	Significant (50%)	Buffer Zones/Monitoring Costs/Applicator availability
16	I	Office Buildings	Double	Significant (60%)	Monitoring Costs / Documentation Efforts
17	K	5 residences, 8 office buildings, 3 roads, church, child care	$100,000	Significant (70%)	Buffer Zones/ notification of neighbors / monitoring costs
18	H	Residences, Office Buildings, Public Roads	Double	Significant (75%)	Buffer Zones, Time to Fumigate 2x, monitoring costs
19	G	3 Residences, 2 Office Buildings	$	Minor (10%)	Buffer Zones
20	L	1 residence and Office Buildings	34% increase	Moderate (30%)	Buffer Zones / Monitoring Costs
21	K	Residences, Office Buildings, Public Roads		Moderate (25%)	Buffer Zones, Time to Fumigate 2x, monitoring costs
22	L	7 Occupied residences and office buildings	?	Significant (76%)	Buffer zones, occupied structures, public roads
23	B	Residence and Office Building	?	Significant (61%)	Buffer Zone restrictions
24	E	Office Building	?	Small	Notification, Monitoring,
25	F	6 residences and office buildings	?	Moderate (50%)	Buffer Zones, monitoring, public notification, Applicator Costs

Table 1 -Continued. Affects of Risk Mitigation Rules on Current Forest Seedling Nursery Production in the Southern US.

Nursery No.	State	Production Acreage	Avg Annual Fumigation	Need to Subdivide Blocks?	No. of Blocks	Is this Possible? Biological	Is this Possible? Economical	2-yr window Estimate of Closing
1	A	60	10	Yes	3	No	No	50%
2	B	60	30	Yes	2	No	No	100%
3	C	88	32	Yes	3	No	No	50%
4	A	45	8	Yes	2	No	No	100%
5	D	55	20	Yes	3	No	No	100%
6	E	30	12	Yes	2	No	No	?
7	F	45	25	Yes	3	No	No	100%
8	G	90	30	Yes	3	No	No	?
9	H	110	30	Yes	3	No	No	25%
10	B	110	30	Yes	3	No	No	100%
11	E							20%
12	K							20%
13	F	210	30	Yes	3	No	No	80%
14	F	60	10	Yes	2	No	No	100%
15	I	100	40	Yes	4	No	No	80%
16	I	50	10	Yes	2	No	No	70%
17	K	125	8	Yes	2	No	No	80%
18	H	100	10	Yes	2	No	No	100%
19	G	60	10	Yes	2	No	No	20%
20	L	80	12	Yes	2 or 3	No	No	30%
21	K	190	12	Yes	2	Maybe	No	80%
22	L	140	9	Yes	2	No	No	20%
23	B	85	20	Yes	4	No	No	80%
24	E	83	18	Yes	3 or 4	No	No	0%
25	F	98	12	Yes	2 or 3	Maybe	No	50%

Table 2. Relative value of manufactured products by state in 2005. Data taken from Geographic Area Statistics: 2005. US Census Bureau, Annual Survey of Manufactures, US Department of Commerce.

	Total Value of Shipments		Employees		Payroll	
	Forestry *	Agriculture**	Forestry	Agriculture	Forestry	Agriculture
Alabama	$11.5 billion	$8.3 billion	33,200	35,900	$1.2 billion	$900 million
Arkansas	$7.2 billion	$14.8 billion	22,900	46,200	$915 million	$1.2 billion
Florida	$7.1 billion	$10.3 billion	28,500	31,600	$1.0 billion	$1.0 billion
Georgia	$15.3 billion	$20.2 billion	42,400	59,100	$1.7 billion	$1.7 billion
Kentucky	$6.4 billion	$8.1 billion	21,600	24,200	$770 million	$780 million
Louisiana	$7.2 billion	$6.2 billion	17,200	16,800	$686 million	$486 million
Mississippi	$5.2 billion	$5.2 billion	17,800	28,700	$684 million	$686 million
North Carolina	$11.7 billion	$14.9 billion	45,600	55,900	$1.7 billion	$1.5 billion
Oklahoma	$2.5 billion	$5.4 billion	4,800	15,100	$260 million	$500 million
South Carolina	$8.6 billion	$4.2 billion	21,100	16,500	$961 million	$490 million
Tennessee	$7.7 billion	$14.5 billion	30,700	37,600	$1.1 billion	$1.3 billion
Texas	$11.6 billion	$32.8 billion	43,700	80,300	$1.6 billion	$2.4 billion
Virginia	$7.9 billion	$10.7 billion	28,100	30,500	$1.1 billion	$919 million

*Sawmills, wood preservation, veneer plywood and engineered wood, pulp, paper, paper board, converted paper products. This does not include the furniture industry, of which some would argue that half of furniture industry is also part of the forest industry. So the 'Forestry' values could be higher in all states for all variables.

** Animal, food, dairy products, animal slaughtering and processing, seafood preparation, sugar processing, bakeries and tortilla, fruit, grain and oilseed processing and manufacturing.

Table 3. Average seedling yield and seedling quality in soils sown to loblolly and slash pine. Comparisons are made between MBr (MC2 and MC33) and other soil fumigants; (i.e. MBr vs Chloropicrin, MBr, vs Basamid, etc). Numbers in parenthesis indicate the number of trials in the comparisons. Trials conducted in the Southern United States either by the Nursery Cooperative or Cooperative Members from 1992-2006.

	Quantity		Quality			
Fumigant (No. of Trials)	Change in Seedling Production vs MBr (%)	Change in Seedling Production vs MBr (No / sq ft)	Change in root collar diameter (mm)	Change in biomass (g)	Change in Grade 1's - Seedlings greater than 4.7 mm RCD (%)	Amount of weed coverage* (sq ft)
methyl bromide / chloropicrin MC2 & MC33	-	-	-	-	-	2 %
chloropicrin (19)	0 %	0	0 %	0 %	0 %	6 %
basamid (25)	- 8 %	- 2	- 2 %	- 12 %	- 26 %	22 %
1, 3-dichloropropene / chloropicrin** (7)	+3 %	+ 0.75	0 %	+ 5 %	+ 23	21 %
metam sodium / chloropicrin (6)***	+ 8 %	+ 2	0 %	+ 3 %	+ 10	11 %
metam sodium (2)	- 2 %	- 0.5	- 4 %	- 5 %	- 8 %	25 %
non-fumigated soils[1] (36)	- 33 %	- 8.25	-14 %	- 10 %	na	39 %

[1] Based on historical seedling production in soils that have not received years of fumigation. Data summarized by W.A. Carey. 1995. Benefits of Fumigation in Southern Forest Nurseries. Annual International Research Conference on Methyl Bromide Alternatives and Emission Reductions. San Diego, CA November 6-8, p 74-1.

na = data was not collected in trials that compared fumigants and seedling production.

*The weed coverage data in this column is taken from: Carey, W.A. and McNabb, K. 1996. The loss of methyl bromide as a fumigant in forest tree nurseries and the impact on reforestation programs. Auburn University Southern Forest Nursery Management Cooperative. Research Report 96-02. 14 p.

** Includes Telone c-17, Triform and MBC, 17%, 30% and 40% chloropicrin, respectively

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