Nursery Cooperative MANAGEMENT ALERT 2015 - 01

LENGTH OF TIME THAT TARP IS LEFT ON NURSERY BEDS POST FUMIGATION MAY AFFECT SOIL FUMIGATION PERFORMANCE

Nursery Cooperative members have been kept up to date on the performance of soil fumigation trials and EPA regulations that govern the use of soil fumigants as they pertain to bystander risk mitigation. In 2009, the Nursery Cooperative was awarded a 5-yr grant as part of the USDA Areawide MBr Alternatives Program. Those trials examined the effect of MBr alternatives over on large plots on a typical 3-yr rotation in 5 nurseries in SC, GA and AL as part of the nursery's operational standards. A summary of the trials, the rates, the plastics and compounds used are shown in Table 1. The complete results of each of these trials can be reviewed in the following Research Reports: RR 08-07, RR 09-06, RR 09-07, RR 10-07, RR 10-09, RR 11-01, RR 11-02. In those operational, yet experimental trials, the plastic tarps (HDPE, VIF, TIF, LDPE) remained on the soil from 10-14 days before it was removed. Therefore, the seedling characteristic data, weed control, nematode control is based on tarps remaining in place for that amount of time.

Table 1. USDA Areawide MBr Alternative Trial Summary, 2008-2013.

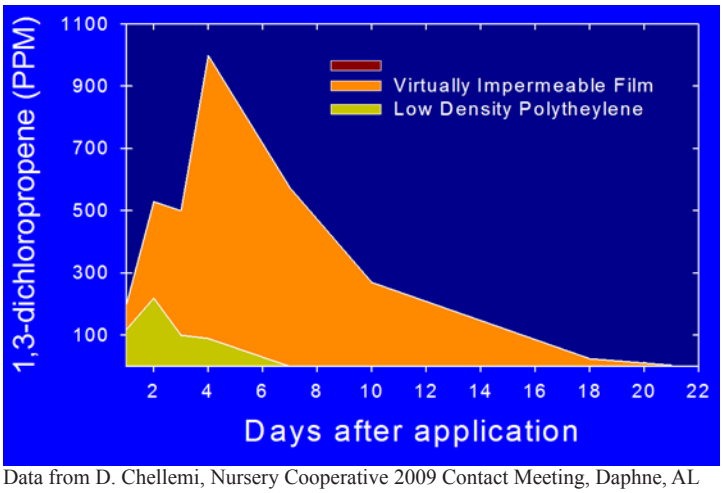
Fumigant	Rate	Components	Plastic	# of studies
Chloropicrin	100 to 300 kg/ha	100% Chloropicrin	HDPE, LDPE, VIF, TIF	8
Pic+®	150 to 300 kg/ha	85% Chloropicrin + 15% Solvent A	HDPE, LDPE, VIF, TIF	8
New Pic +	300 kg/ha	85% Chloropicrin + 15% Solvent B	HDPE	2
DMDS + Chlor	690 to 730 kg/ha	79% DMDS + 21% Chloropicrin	HDPE	6
Chlor 60®	100 to 400 kg/ha	60% Chloropicrin & 40% 1,3-D	HDPE, LDPE, VIF, TIF	8
Midas® 50/50	160 kg/ha	50% Iodomethane + 50% Chloropicrin	VIF	1
Midas ®98/2	100 kg/ha	98% Iodomethane + 2% Chloropicrin	VIF	1

The amount of time the plastic remains in place becomes an important factor in determining the dose x time concentration and area under the curve. An example of how dose x time x tarp affects the area under the curve is shown in Figure 1. In this figure, soil samples were taken from areas that were treated with the same rate of Telone under either LDPE or VIF over time. The concentration (ppm) is on the Y-axis with the time since application (days) on the X-axis. The total area under the curve (dose x time) increases as time since application increases and was of function of the tarp type. The use of VIF over LDPE increased the area under the curve by 900% (or 9 times).

The hypothetical effect of removing the VIF tarp at day 5, 10 and 14 is shown in Figure 2 with lines indicating the differential amount (or decreased dose x time) at each of those days. Removing the tarp at Day 14 reduces the dose x time by 6% of the total. Removing the tarp at Day 10 at results in a 20% reduction of the total and removal of the tarp on Day 5 by 57% of the total. The difference between Day 5 and Day 10 is 47% of the area under the curve.

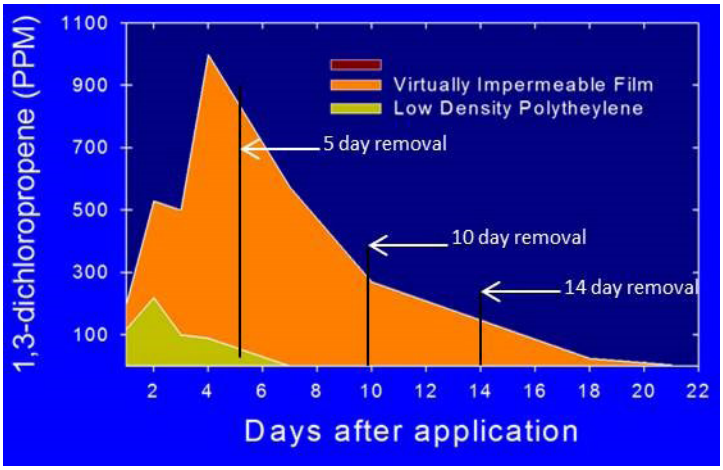
The US EPA label regulations for the use of MBr/Chloropicrin mixtures indicate that the tarps must stay in place for at least 5 days, and if they are removed before 14 days, then handling issues come into force. Leaving the tarps on longer, will increase the area under the curve and the dose x time response. Except for the risk of tarps blowing away, there is no need or requirement to remove tarps at Day 5. Consider the area under the curve when scheduling tarp removal with your soil fumigation. Nursery Cooperative research indicates that the tarps be kept in place for 10-14 days if possible.

Figure 1. Area under the curve using Telone under two different plastic tarps.



Data from D. Chellemi, Nursery Cooperative 2009 Contact Meeting, Daphne, AL

Figure 2. Area under the curve with three different tarp removal dates, 5, 10 and 14 days post fumigation.



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