Methyl Bromide Fumigation

As regular *FNN* readers know, I have had a section on this subject in almost every issue for the past several years. Well, the methyl bromide ban is still making news and so, rather than review the entire socio-political background again, I will refer readers to previous *FNN* issues *and* just cover the newest developments.

The projected phase-out of methyl bromide by the year 2,001 has spawned a wave of new research on the fate of this popular fumigant in the atmosphere, as well as tests of new alternatives. The Methyl Bromide Global Coalition has appropriated almost $14 million for new research and the results of the first trials are now being published.

Methyl bromide is considered to be the most important source of the atmospheric bromine radicals which are partially responsible for destroying the Earth's ozone layer (Figure 8). Current estimates are that soil fumigation accounts for about 80% of synthetic methyl bromide use. There is some doubt, however, as to whether soil applications really escape to the atmosphere at all, and that furthermore, soil may actually be a "sink" for methyl bromide. Recent research has shown that soil bacteria can break down significant amounts of methyl bromide. An article in the respected journal *Nature* presents research that in some soils methyl bromide is rapidly and irreversibly consumed below the levels found in the global atmosphere. If this biological breakdown is expanded to a global scale and combined with the already well documented chemical destruction of methyl bromide in salt water, then its atmospheric lifetime is half what was previously thought and its ozone depletion potential (ODP) is about 30% smaller than the previous estimate. That ODP is still high enough to keep it under the regulation of the Montreal Protocol and the Clean Air Act, however.

This research does not apply to the high methyl bromide concentrations used in soil fumigation, and besides, fumigation kills soil bacteria anyway. What is significant is that we are finally learning more about the chemical fate of methyl bromide in the soil and in

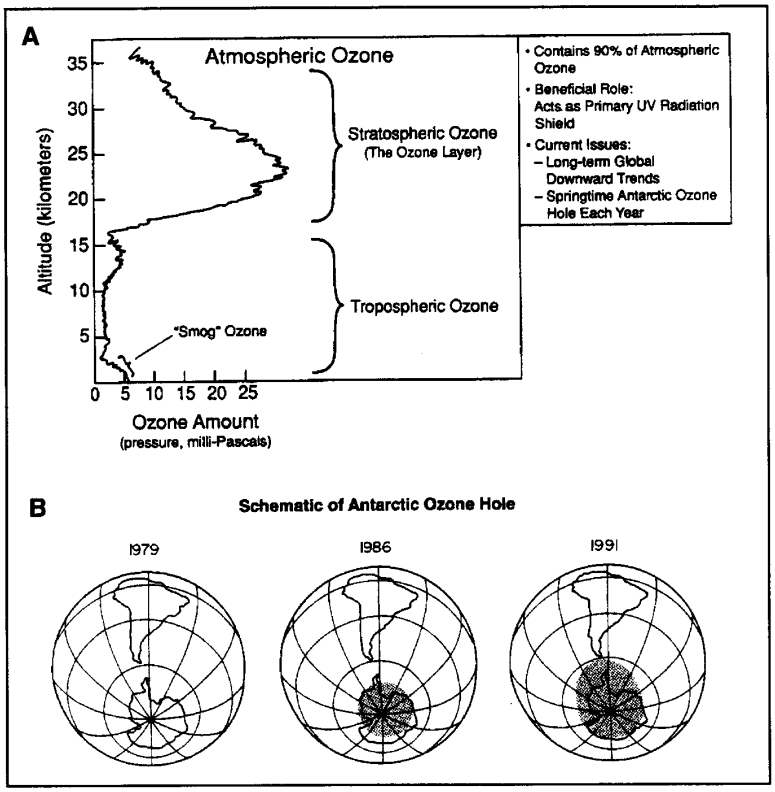

Figure 8. The protective ozone layer in the stratosphere (A) has been decreasing in recent years over the South Pole (B), so bromine and other halogens are facing severe restrictions.

the atmosphere, and we will be able to really determine if it poses a threat to the ozone layer.

On the other side of the coin, the US Environmental Protection Agency (EPA) has just published the ***Scientific Assessment of Ozone Depletion: 1994*** which states that "methyl bromide continues to be viewed as a significant ozone-depleting compound". They cite laboratory studies that confirm the ozone depleting role of methyl bromide, but acknowledge that there are "significant uncertainties in quantifying the oceanic sink for atmospheric methyl bromide". The EPA has also released ***Alternatives to Methyl Bromide,*** which is a summary of information on methyl bromide alternatives, including the Aqua Heat® hot water soil treatment and Basamid® Granular fumigant. Cost comparisons are also provided, one of which estimates application costs of Basamid to be similar to methyl bromide (Table 4).

Obviously, the situation will continue to change as more information becomes available, and the perspective and significance will vary depending on whom you talk to. The EPA continues to stress that methyl bromide will be phased out by the year 2,001 and that nurseries should immediately start switching to alternatives. On the other hand, the Methyl Bromide Working Group contends that the current level of knowledge about the fate of methyl bromide in the atmosphere is incomplete and that further research will show that this fumigant is not as damaging as is currently believed. I will just continue to try to keep you up-to-date. Contact the following sources for the latest information on the methyl bromide fumigation, and note that the issue now has a World Wide Web site!!

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Table 4. Cost comparison of two soil fumigation alternatives to methyl bromide fumigation.

Cost Factor	Basamid Granular	Methyl bromide/chloropicrin
Application Rate	250 to 350 lbs a.i. per acre	375 lbs a.i per acre
Chemical Price	$2.90 per lb	$1.64 per lb
Chemical Cost	$725 to 1,015 per acre	$615 per acre
Est. Application Cost	$1,800 to $2,000	$1,800 to $2,000