Comments

Tree Planters' Notes

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Cover: Hoback River on the Bridger-Teton National Forest in Wyoming (R.E. Grossman, USDA Forest Service).

Methyl Bromide-We Can Learn to Live Without It!

Let's be realistic-methyl bromide is on its way out. It's just a question of time. Do you remember DDT? It was *the* broad-spectrum insecticide for many years until Rachael Carson blew the whistle in 1962. We learned, very quickly, that other chemicals could do the job, with much less impact on the environment.

The scientific data on this issue may be cloudy, but the political agenda is clear. EPA has called for a phase-out of all chemicals that may deplete the ozone layer by the year 2000. There are other factors-some political, some emotional-that may produce an earlier cancellation.

Faced with this situation, let's look at our alternatives. Methyl bromide is an effective soil fumigant in forest tree nurseries. It is the chemical of choice for controlling a wide array of soil-borne pathogens (for example, *Cylindrocladium, Fusarium, Macrophomina, Phytophthora,* and *Rhizoctonia* species). It is also effective in the control of some difficult weeds, such as nutsedge *(Cyperus* species) and prostrate spurge *(Euphorbia supina L.).* It should be pointed out, however, that herbicides are available for the control of some of these weeds and that herbicides are much safer to use and are more cost-effective than methyl bromide. An integrated pest management approach can also be used to minimize the need for soil fumigants.

In the absence of methyl bromide, consider the following management strategies in your nurseries:

- *Carefully match the species to the nursery site.* Grow bottomland hardwoods in the wetter compartments and pines in the drier areas. Pay close attention to soil pH and the preference of the species for soil acidity as well as soil texture and drainage.
- *Rotate the crops on a systematic basis.* Choose cover crops that reduce pathogen populations rather than build them up.
- *Map your nursery annually, with special emphasis on the chronic problem areas.* Consider infrared aerial photos to document trouble spots.
- *Pay close attention to good drainage.* Many root disease problems can be avoided by improving soil drainage. Use subsoiling, deep plowing, land shaping and ditching to improve drainage. Consider tile drains in difficult areas. Avoid soil compaction throughout the nursery.
- *Maintain high levels of organic matter in the soil.* Organic matter offers many benefits, including improved cation exchange capacity, improved soil texture, and improved lateral root and mycorrhizal development. Also, organic matter often promotes soil-borne microorganisms that suppress the activity of pathogenic fungi.

- *Practice judicious weed control throughout your nursery.* This includes good sanitation in non-production areas as well as the seedbeds. Riser lines, alleys, and other non-production areas must be kept weed-free to prevent weed seed dispersal throughout the nursery
- *Grow your seedlings at low density.* Larger root systems produce more vigorous seedlings, which are resistant to many pathogenic organisms.
- *Select clean, pathogen free mulch.* Mulch materials are often a source of weed seeds and spores of pathogenic fungi.
- *Provide optimum conditions for both ecto- and endomycorrhizae.* Mycorrhizae play an important role in forest tree nurseries. In addition to their nutritional benefits to the host seedling, mycorrhizae often have the ability to repel pathogenic fungi in the soil.

Perhaps the most difficult decision to be faced is what to do about the chronic, persistent diseases that are endemic in some nurseries. In the absence of methyl bromide there appear to be three alternatives:

1. Use an alternative fumigation material (for example, Dazomet, etc., or possibly chloropicrin) when needed. Be sure to follow the label carefully.
2. Try solar tarping-it can be effective under the right conditions.
3. If all else fails-move out of these disease-prone areas.
4. Apply pressure to the agricultural chemicals manufacturers to develop new, effective, *and* environmentally safe fumigation chemicals.

There will be some difficult situations. Perhaps some nurseries will even be quarantined. But nursery managers are a determined, clever, and resourceful group. They will accept the challenge and win.

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