

Methyl Bromide Alternatives

Both chemical and non-chemical alternatives to methyl bromide exist, and several pest control tools can manage the pests currently controlled with methyl bromide. Research on alternatives is ongoing and EPA continues to prioritize the registration of alternatives to methyl bromide. The U.S. Department of Agriculture/Agricultural Research Service has also conducted [research on alternatives to methyl bromide](#).

The table below identifies a selection of possible alternatives based on use category. This list was last updated in 2012. More recent information on alternatives may be available from other sources, such as the following:

- Proceedings from the [Annual Methyl Bromide Alternatives Outreach \(MBAO\) Conference \[Exit\]](#)
- [U.S. Department of Agriculture, Agricultural Research Service](#)

Use Category	Alternatives Available	Status of Registration	Alternatives Under Development	Possible Date of Registration
Commodities	Propylene Oxide	Registered	Ethyl Formate	Not registered
	Phosphine	Registered	Ethylene Oxide	Not registered
	Sulfuryl Fluoride	Registered	Methyl Formate	Not registered
Cucurbits	1,3-Dichloropropene	Registered	Furfural	Not registered
	Chloropicrin	Registered		
	Dimethyl Disulfide	Registered	Propargyl Bromide	Not registered
	Glyphosate	Registered	Sodium Azide	Not registered
	Halosulfuron	Registered		
	Metam Sodium	Registered		
	Paraquat	Registered		
	1,3-Dichloropropene + Chloropicrin	Registered		
Eggplant	1,3-Dichloropropene	Registered	Furfural	Not registered

	Chloropicrin	Registered		
	Dimethyl Disulfide	Registered	Propargyl Bromide	Not registered
	Halosulfuron	Registered	Sodium Azide	Not registered
	Metam Sodium	Registered		
	Napropamide	Registered		
	Trifluralin	Registered		
	1,3-Dichloropropene + Napropamide + Trifluralin	Registered		
	1,3-Dichloropropene + Chloropicrin	Registered		
	Metam Sodium + Chloropicrin	Registered		
Food Facilities	Phosphine	Registered	Ethyl Formate	Not registered
	Sulfuryl Fluoride	Registered	Ethylene Oxide	Not registered
			Methyl Formate	Not registered
Forest Seedlings	1,3-Dichloropropene	Registered	Propargyl Bromide	Not registered
	Chloropicrin	Registered	Sodium Azide	Not registered
	Dazomet	Registered		
	Dimethyl Disulfide	Registered		
	Metam Sodium	Registered		
	Metam Sodium + Chloropicrin	Registered		
	1,3-Dichloropropene + Chloropicrin	Registered		

Ham	Sulfuryl Fluoride	Registered		
Nurseries: Raspberries	1,3-Dichloropropene	Registered	Dimethyl Disulfide	Not registered
	Chloropicrin	Registered	Sodium Azide	Not registered
	Dazomet	Registered	Propargyl Bromide	Not registered
	Metam Sodium	Registered		
	1,3-Dichloropropene + Chloropicrin	Registered		
	1,3-Dichloropropene + Metam Sodium	Registered		
Nurseries: Fruit and Nut Tree	1,3-Dichloropropene	Registered	Dimethyl Disulfide	Not registered
	Chloropicrin	Registered	Sodium Azide	Not registered
	Dazomet	Registered	Propargyl Bromide	Not registered
	Metam Sodium	Registered		
	1,3-Dichloropropene + Chloropicrin	Registered		
	1,3-Dichloropropene + Pic + Metam Sodium	Registered		
	1,3-Dichloropropene + Metam Sodium	Registered		
	1,3-Dichloropropene + Dazomet	Registered		
Nurseries: Roses	1,3-Dichloropropene	Registered	Dimethyl Disulfide	Not registered
	Chloropicrin	Registered	Sodium Azide	Not registered
	Dazomet	Registered	Propargyl Bromide	Not registered
	Metam Sodium	Registered		

	1,3-Dichloropropene + Chloropicrin	Registered		
	1,3-Dichloropropene + Metam Sodium	Registered		
	1,3-Dichloropropene + Chloropicrin + Metam Sodium	Registered		
Orchard Replant	1,3-Dichloropropene	Registered	Dimethyl Disulfide	Not registered
	Chloropicrin	Registered	Sodium Azide	Not registered
	Dazomet	Registered	Propargyl Bromide	Not registered
	Metam Sodium	Registered		
	Sodium Tetrathiocarbonate	Registered		
	1,3-Dichloropropene + Chloropicrin	Registered		
	1,3-Dichloropropene + Metam Sodium	Registered		
	1,3-Dichloropropene + Chloropicrin + Metam Sodium	Registered		
Ornamentals	1,3-Dichloropropene	Registered	Furfural	Not registered
	Dazomet	Registered	Sodium Azide	Not registered
	Dimethyl Disulfide	Registered	Potassium Tri-iodide	Not registered
	Chloropicrin	Registered	Propargyl Bromide	Not registered
	Metam Sodium	Registered		
	1,3-Dichloropropene + Chloropicrin	Registered		

	Dazomet + Chloropicrin	Registered		
	Metam Sodium + Chloropicrin	Registered		
Peppers	Metam Sodium	Registered	Furfural	Not registered
	1,3-Dichloropropene	Registered	Sodium Azide	Not registered
	Chloropicrin	Registered	Propargyl Bromide	Not registered
	Dimethyl Disulfide	Registered		
	Halosulfuron	Registered		
	Glyphosate	Registered		
	Paraquat	Registered		
	Metam Sodium + Chloropicrin	Registered		
	1,3-Dichloropropene + Chloropicrin	Registered		
	1,3-Dichloropropene + Metam Sodium	Registered		
Post-Harvest Uses	Phosphine	Registered	Ethyl Formate	Not registered
	Sulfuryl Fluoride [*]	Registered	Ethylene Oxide	Not registered
			Methyl Formate	Not registered
Strawberry	1,3-Dichloropropene	Registered	Furfural	Not registered
	Chloropicrin	Registered	Propargyl Bromide	Not registered
	Dazomet ^{**}	Registered		
	Dimethyl Disulfide	Registered		
	Metam Sodium	Registered		

	Terbacil	Registered		
	1,3-Dichloropropene + Chloropicrin	Registered		
	1,3-Dichloropropene + Chloropicrin + Metam Sodium	Registered		
	Metam Sodium + Chloropicrin	Registered		
Strawberry Nursery	Chloropicrin	Registered	Dimethyl Disulfide	Not registered
	1,3-Dichloropropene	Registered	Furfural	Not registered
	Metam Sodium	Registered	Propargyl Bromide	Not registered
			Sodium Azide	Not registered
Tomato	1,3-Dichloropropene	Registered	Furfural	Not registered
	Chloropicrin	Registered	Pebulate	No longer registered
	Dazomet**	Registered	Propargyl Bromide	Not registered
	Dimethyl Disulfide	Registered	Sodium Azide	Not registered
	Fosthiazate	Registered		
	Glyphosate	Registered		
	Metam Sodium	Registered		
	Paraquat	Registered		
	Halosulfuron-methyl	Registered		
	s-Metolachlor	Registered		
	Trifloxysulfuron-methyl	Registered		
	Rimsulfuron	Registered		

	Metam Sodium + Chloropicrin	Registered		
	1,3-Dichloropropene + Metam Sodium	Registered		
	1,3-Dichloropropene + Chloropicrin	Registered		
Turf (sod)	1,3-Dichloropropene	Registered	Dimethyl Disulfide	Not registered
	Chloropicrin	Registered	Sodium Azide	Not registered
	Furfural	Registered		
	Metam Sodium	Registered		
	Dazomet	Registered		
	Dazomet + Chloropicrin	Registered		
	Metam Sodium + Chloropicrin	Registered		

*Research on-going to evaluate efficacy in controlling mites

**The registration for Dazomet is limited to California only.

In some situations involving small-scale production, there are non-chemical alternatives to methyl bromide. For example, steam sterilization of soil is a viable alternative for the use of chemical fumigants in some soil types. In the post-harvest sectors, sanitation and Integrated Pest Management (IPM) techniques are used to manage pest populations and extend the time between chemical fumigations. Pheromone traps, electrocution traps, and light traps are also used to monitor pest populations.

OTHER INFORMATION

[Annual MBAO Conference](#)

Additional information about alternatives to methyl bromide as they relate to individual sectors can be found in the annual U.S. Nomination submission. Between 1995 and 1997, EPA published Case Studies about alternatives to methyl bromide. For copies of these Case Studies, please call the Stratospheric Ozone Protection Hotline at 1-800-296-1996.