

Comment Info: =====

General Comment: I am writing in response to the proposed exemption from tolerance for pre-harvest sprays of 1-methylcyclopropene (1-MCP) on fruits and vegetables. Docket (ID) number EPA-HQ-OPP-2007-0433, pesticide petition (PP) number 7F7170. While the petition is for a tolerance exemption, the following concerns are valid in the context that granting of the exemption would potentially "open the floodgates" of use.

The seemingly simple categorization of "fruits and vegetables" represents a wide array of crops produced under a diversity of conditions. As such, I question just how much is really known about the effects of 1-MCP in the environment, especially from the perspective of unintended target organisms, including endangered species. It is one thing to release 1-MCP gas into a sealed apple storage room under controlled conditions by trained company technicians, but it is quite a different matter when considering the potential widespread release of 1-MCP into the environment by a variety of applicators using spray equipment of different shapes and sizes (not to mention age and calibration capabilities) on a plethora of crops loosely described as "fruits and vegetables" grown at different times of the year under all sorts of conditions (e.g., soils rich in clay with high binding (CEC) capacity, soils high in sand content that allow rapid percolation of surface applied agrochemicals).

Ethylene is a profound molecule, having far-ranging effects within the plant kingdom as a plant hormone. It is well known to play a significant role throughout the plant life cycle, from seed germination, seedling growth and development, floral initiation and development, fruit ripening, through to senescence. In addition to these developmental effects, ethylene also serves as an endogenous signaling molecule as plants respond to stress (e.g., adverse environmental conditions, insect feeding, microbial infection). On a molecular level, ethylene induces gene expression.

It is also well established that ethylene metabolism occurs in the soil, with microbial activity in some instances generating ethylene and in other instances catabolizing ethylene. While the role of ethylene within the highly heterogeneous soil environment may not be as clearly understood as it is in plants, it is nonetheless reasonable to assume there is an evolutionary dynamic at work that we should be mindful of.

So, given the ubiquity of ethylene in the environment, the fundamental role it plays

in plant growth and development, and the apparent interplay it has within the rich soil ecosystem (note: one could argue that because less is known, the lighter we should tread), the key question that needs to be asked is this: what unintended and possibly adverse effect(s) will 1-MCP, as a gas that may absorb to and/or infiltrate a variety of living and non-living substrates, create in the environment?

Related to this is of course a cascade of issues that need to be understood, including but not limited to: (a) the behavior of 1-MCP in the soil (e.g., movement, half-life, metabolic fate under aerobic and anaerobic conditions), (b) the unintended effects of 1-MCP on non-target plants in fields, orchards, and vineyards (e.g., interrupting the natural flowering cycle/rhythm of a plant such that it no longer flowers at all and thus produces no seed and/or delays the flowering window such that its flowers no longer serve as a food source for bees or insects), and (c) the possible perturbation of aquatic systems as 1-MCP gets into waterways (e.g., half-life, effects of binding to ethylene receptors in algae and aquatic plants like duckweed).

Perhaps the registrant already has answers to these questions, but it is not apparent in this petition summary.