

WHAT'S HAPPENING WITH CHLORINE DIOXIDE

by

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Chlorine dioxide is being widely used for potato disease management in storage despite receiving a Section 18 special exemption late in 1998 with a paucity of efficacy data. However, chlorine dioxide has a long and safe past as a superior biocidal compound with a multitude of industrial and food uses. It is a general biocide with activity against bacteria, fungi, viruses, and algae. It is used for water treatment, wood pulp manufacture, mold control in the fruit packing industry, and post harvest disease control in some situations. It is an extremely broad spectrum and effective disinfectant more active than other disinfectants, less corrosiveness, and less inactivation by organic matter. It is extremely user safe, leaves no residues and has no adverse environmental concerns. The purpose of this presentation is to update the potato industry on the status of chlorine dioxide. Chlorine dioxide is a gas that dissolves in water. It is made from sodium chlorite and is a strong oxidizing agent that kills on contact. Chlorine compound chemistry is very complex and understanding the chemistry of ClO₂ is also complex. In agriculture, it can be used to treat uncut, unpeeled vegetables at concentrations up to 5 ppm followed by a potable rinse. Many plant pathogens are killed by concentration of less than 100 ppm including *Erwinia carotovora*, *Phytophthora infestans* and *Helminthosporium solani*. Many trials have been conducted in recent years by growers and industry demonstrating the effectiveness of ClO₂ in commercial operations, but only limited scientific trials have been conducted. Preliminary trials conducted by our lab and others have shown effective control of the fungi causing late blight and silver scurf under controlled conditions. Chlorine dioxide is currently registered for control of late blight on stored potatoes until June 30, 1999. It can be applied to potatoes as a low-pressure spray going into storage or to treat potatoes in storage as a mist at a maximum concentration of 200 ppm. Two products are registered for use; Purogene (Oxine), Bio-Cide International, and Anthium AGP, Engelhard/International Dioxide. Certain restrictions for total product used and residue testing apply. Proper activation and mixing of ClO₂ are essential. Both products must be activated with food grade acid, allowed to react 10 minutes and diluted prior to use. In lab and storage trials conducted by our research group with naturally diseased and inoculated tubers, we have shown disease reduction of soft rot, late blight and silver scurf. We are continuing these trials. Future uses include other storage diseases, seed treatment, storage and machinery disinfection, and other formulations.