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Safety Devices for Chemigation

American Society of Agricultural and Biological Engineers

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Safety Devices for Chemigation

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1 Purpose and Scope

1.1 This Engineering Practice specifies necessary safety devices to be used when injecting liquid chemicals into irrigation systems. Many irrigators apply fertilizers, herbicides, insecticides, fungicides, nematicides and other chemicals through irrigation systems. This process is known as chemigation. Chemicals which are properly formulated can be uniformly and safely applied by injecting them into water flowing through a properly engineered irrigation and injection system.

1.2 Pollution of a water supply can occur if proper safety devices are not installed and maintained on the chemical injection and irrigation equipment. Three specific hazards to guard against are: (1) an unexpected shutdown of the irrigation pumping plant due to mechanical or electrical failure while it is unattended, causing concentrated chemicals or a mixture of chemicals and water to be drawn into the water supply, (2) an irrigation pumping plant shutdown failure while the injection equipment continues to operate, possibly causing concentrated chemicals or a mixture of water and chemicals to backflow into the water source, and/or cause an undesirably high concentration of chemicals in the irrigation system, and (3) the chemical injection system stopping while the irrigation pump continues to operate, possibly causing water to backflow through the chemical supply tank and overflow chemical onto the ground.

1.3 This Engineering Practice describes safety devices which will prevent the hazards described in paragraph 1.2 for a dedicated irrigation water source. It is not intended that this Engineering Practice apply for irrigation systems connected to a public or private water distribution system used as a municipal, industrial, or residential water supply. All irrigation systems used for chemigation should be equipped with a loss-of-pressure shutdown safety device to avoid continued operation following a system malfunction. Equipment required for mixing or storing the chemicals is not covered in detail by this Engineering Practice.

2 Definitions

2.1 backflow prevention device: A safety device used to prevent water pollution or contamination by preventing flow of a mixture of water and/or chemicals in the opposite direction of that intended.

2.2 check valve: A device to provide positive closure which effectively prohibits the flow of material in the opposite direction of normal flow when operation of the irrigation system pumping plant or injection unit fails or is shut down.

2.3 interlock devices: Safety equipment used to insure that if the irrigation pumping plant stops, the chemical injection pump will also stop. Devices may also be used to shut down the irrigation system if the injection system fails.

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