

Chemigation Management

Chemigation is the process of applying an agricultural chemical (pesticide or fertilizer) to the soil or plant surface with an irrigation system in which the chemical has been injected into the irrigation water. Depending on the type of agricultural chemical being applied, chemigation may be referred to as herbigation, insectigation, fungigation, fertigation, etc.

Only pesticides displaying product EPA label approval for application through an irrigation system can be applied by chemigation. Also, each chemigation and irrigation system must use the required safety equipment specified on the EPA label as well as any listed in the user's respective state codes. Some states also may require a system or operator permit before chemigation can be used to apply any product.

Chemigation can be an effective application option for some labeled pesticides if the irrigation system can apply the chemical/water solution uniformly over the target area with the correct water depth. Some pesticides work best with less than 0.25 inches of water per application. Most late model center pivot and linear move systems provide adequate distribution but some may not be able to apply a small enough water depth. Solid set sprinkler systems may be effective for some pesticides but require close timing of chemical movements to get complete and uniform coverage of the field. Traveling gun and hand move systems do not provide water distribution that has high uniformity and are not recommended. Drip systems apply water to only a limited area of the soil so are not recommended for most pesticide products. Further information on appropriate water application amounts and which irrigation systems are recommended can be found on the product label.

If proper check valves and interlocks are not in place or maintained, injected chemicals could potentially backflow into the water source. EPA and many state regulations specify that each system must contain a reduced pressure zone (RPZ) backflow prevention valve or one or two independent check valves with low-pressure drains and vacuum relief valves between the irrigation water source and the point of chemical injection. Also, most regulations require a power interlock between the irrigation pump and the chemical injector unit, a low pressure shut down switch and a check valve on the chemical injection hose. For specific requirements, check with the appropriate local or state agency.

Accurate calibration of the irrigation system and the pesticide application rate is most important. The



Chemigation offers the advantage of applying pesticides or fertilizers to vegetable crops when and where they are most needed.

chemigation operator must be aware of the irrigation system's application speed (acres per hour) for the chosen water application amount and the concentration of chemical solution to determine the rate of chemical injection. A step-by-step procedure on how to determine the system's speed application and chemical injection rate is described in the MidWest Planning Service (MWPS) handbook #30 *Sprinkler Irrigation Systems*, available at www.bae.umn.edu/extens/mwps/index.html.

More information about the special equipment, operations, and calibration is available in the University of Minnesota Extension Service bulletins, AG-FO-6122, *Chemigation Safety Measures*, and AG-FO-18, *Nitrogen Application with Irrigation Water*, available at www.extension.umn.edu/.