

Chemigation

Product Spotlight

Chemigation is the process of applying an agricultural chemical (fertilizer or pesticide) to soil or plant surfaces with an irrigation system by injecting the chemical into irrigation water, according to a definition from the University of Minnesota. Depending on the type of agricultural chemical being applied, chemigation may be known as "fertigation," "herbigation," "insectigation," or "fungigation."

Carefully designed, safely managed chemigation systems can offer several advantages over other treatment practices, including more uniform distribution and reduced operator hazards. However, without strict controls, chemigation systems can contaminate surface and groundwater and lead to legal problems.

Legal regulations

Chemigation systems require very careful supervision to avoid over-watering with pesticide mixtures.

Most state agriculture departments have chemigation regulations and pesticide and fertilizer permit programs. Many state health departments also have rules on chemical storage tanks, chemigation systems, and water wells (irrigation, potable, and public water systems).

Since chemigation equipment can

expose persons to pesticides, the Federal Worker Protection Standard protects employees who work on chemigation equipment. Only trained and equipped handlers are allowed to operate, move, or repair chemigation equipment parts that may contain pesticide residues.

Available safety equipment can help further protect against some legal ramifications of practicing chemigation. When properly installed, such equipment can prevent backflow and subsequent groundwater contamination.

According to Purdue University, liability-reducing safeguards may include the following:

- Requiring employees to obtain and maintain certified applicator status
- Pre-chemigation water analysis at the water source and locations near the water source
- Considering run-off direction
- Knowledge of potential plant toxicity when preparing chemical application schedules and dosage rates
- Judiciously adhering to recommended application rates
- Sound soil conservation techniques
- Periodic equipment calibration

Helpful hints

Here is a list of helpful guidelines for chemigation from the North Carolina State University

Cooperative Extension:

- Don't apply pesticides through an irrigation system if the soil is wet. If one or more inches of irrigation or rainfall has occurred within 24 hours, the soil is probably too wet to apply pesticides.

- Use the least amount of water possible to apply the chemicals.

- Don't chemigate when you mean to irrigate.

- Use field borders to catch runoff water around treated areas.

- Use erosion and runoff controls.

- Avoid wind drift by considering weather and equipment.

- Use equipment with proper nozzle size and water pressure to provide large water droplets, which resist wind drift.

- Do not chemigate when wind speed exceeds five miles per hour.

- Do not use gun-type sprinklers that spray a fine mist high into the air.

- Design irrigation equipment to cover the entire field, but do not place sprinklers close to the field edge.

- Apply only pesticides labeled for use in irrigation systems.

- Regularly check equipment for the following:

- ✓ Water leaks
- ✓ Proper operation of antisiphon systems
- ✓ Proper setting and function of relief and check valves
- ✓ Clogged nozzles

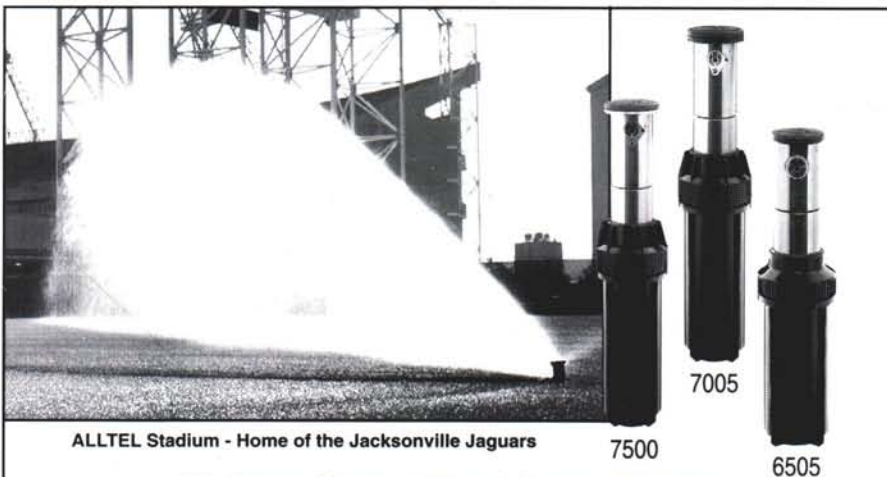
Fertigation

Injection equipment is necessary to adapt an irrigation system for fertigation. The technique also requires a large reservoir (500- to 1500-gallon capacity) to store the liquid fertilizer.

Fertilizer may be added to irrigation water by using an adjustable metering pump or another injection device. The injection system may be controlled manually or automatically. Electronically monitoring the injection rate or volume can be combined with programming valves or injectors to be shut off after a prescribed injection volume. Chemigators should note that the uniformity of chemical application cannot exceed the uniformity of water application from the irrigation system.



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