



# STATE OF IDAHO

DEPARTMENT OF AGRICULTURE

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## **Chemical Injection Systems for Residential, School, Commercial and Municipal Landscapes**

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The purpose of this notice is to provide manufacturers, retailers and operators of residential, school, commercial and municipal chemical injectors with information that will help them understand Idaho State Department of Agriculture (ISDA) requirements associated with these chemical injectors and the chemical products used in the injectors.

Chapter 34, Title 22, Idaho Code, known as the Pesticides and Chemigation Law, and IDAPA 02.03.03, Rules Governing Pesticide and Chemigation Use and Application, are referenced in this document to establish a clear understanding of chemigation equipment certification, chemigation equipment requirements for injection of chemicals into water sources and licensing requirements. The referenced documents are available at ISDA offices or on the ISDA web site at [www.agri.idaho.gov/Categories/Pesticides/pesticidelawsandrulesphp](http://www.agri.idaho.gov/Categories/Pesticides/pesticidelawsandrulesphp)

### Chemicals

Is the product you manufacture/sell or recommend to be used in the injector you manufacture/sell considered by Idaho Code to be a chemical?

Idaho Code section 22-3401 defines the following terms:

(4) "Chemical" means any fertilizer or pesticide.

...

(15) "Fertilizer" means any formulation or product used as a plant nutrient which is intended to promote plant growth and contains one (1) or more plant nutrients.

...

(23) "Pesticide" means but is not limited to (a) any substance or mixture of substances intended to prevent, destroy, control, repel or mitigate any insect, rodent, nematode, snail, slug, fungus, weed and any other form of plant or animal life or virus, except virus or fungus on or in living man or other animal, which is normally considered to be a pest or which the director may declare to be a pest, and (b) any substance or mixture of substances intended to be used as a plant regulator, defoliant or desiccant, and (c) any spray adjuvant.

If the product you sell or recommend to be used in an irrigation system injector is a "Fertilizer" or "Pesticide" as defined by Idaho Code, injection of the product must be in compliance with the Idaho chemigation laws and rules.

Plant nutrients such as nitrogen, phosphorus, potassium (NPK) and micronutrients (i.e. boron (B), chlorine (Cl), cobalt (Co), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo), sodium (Na), etc. are fertilizers that are regulated by Idaho chemigation laws and rules. Injection of any product that contains one (1) or more of these elements into an irrigation system to promote plant growth is considered chemigation under Idaho Code (Idaho Code § 22-3401(5)).

Although a pesticide product may contain what is considered to be “organic” compounds (i.e. eugenol, cedarwood oil, lemongrass oil, peppermint oil, citronella, etc.) it is, by Idaho Code definition, a pesticide if labeling or technical data makes claims that the product prevents, destroys, controls, repels or mitigates pests. EPA registered pesticides approved for application by chemigation will contain chemigation information (authorization) in the product’s label directions.

Unprocessed animal manure, composted materials, hydro-compost, humic acid, yeast, amino acids, fulvic acid and soil amendments are not defined as chemicals under Idaho Pesticides and Chemigation Law. Injection of these materials into irrigation systems is not regulated by IDAPA 02.03.03, Rules Governing Pesticide and Chemigation Use and Application, but, in some cases, may be regulated by other Idaho statutes or federal regulations to protect the waters of the state.

If distributed in Idaho, all pesticides, adjuvants and fertilizers must be registered with ISDA. Contact ISDA Pesticide Registrations at 1-208-332-8593 for pesticide and adjuvant registration or ISDA Plant Industries, Feed and Fertilizer Program at 1-208-332-8625 for fertilizer registrations. Or visit the ISDA web site at [www.agri.idaho.gov](http://www.agri.idaho.gov) and go to the Division of Agricultural Resources (pesticide registration – includes adjuvants) or Division of Plant Industries (fertilizer registration).

### Chemigation

Idaho Code section 22-3401 defines the following terms:

(5) “Chemigation” means any process whereby chemicals are added to irrigation water applied to land, crops or plants through an irrigation system, such as, but not limited to, agricultural, nursery, turf, lawn, golf course and greenhouse sites.

...

(17) “Irrigation system” means any device or combination of devices having a hose, pipe, or other conduit which connects directly to any source of ground or surface water, through which water or a mixture of water and chemicals is drawn and applied to land, crops or plants. The term does not include any hand-held sprayer or other similar device which is constructed so that an interruption in water flow automatically prevents any backflow into the water source.

Note that, by definition, addition of chemicals to lawn irrigation systems is chemigation and is subject to ISDA chemigation laws and rules.

## Chemigation Equipment Requirements

Chemigation laws and rules in Idaho specifically require the installation of ISDA approved anti-backflow devices and other equipment to prevent backflow of chemicals into the water source and/or chemical supply tank.

IDAPA 02.03.03.962.03 lists specific equipment requirements:

Domestic Water Supply System Cross-Connected for Chemigation. Any irrigation system used for chemical application cross-connected to a domestic water supply system shall verify that the system complies with either Subsection 962.03.a or 962.03.d. and shall include all other additionally specified equipment for each;

a. Reduced Pressure Principle Backflow Prevention Assembly (RP). The irrigation system shall contain a functional reduced pressure backflow preventer assembly (RP); and

i. The RP assembly shall be located on the irrigation pipeline between the water supply pump and the point of chemical injection, and downstream from any domestic water supply diversion point.

ii. The purpose of a Reduced Pressure Principle Backflow Prevention Assembly (RP) is to keep contaminated water from flowing back into a domestic water supply system when some abnormality in the system causes pressure to be temporarily higher in the contaminated part of the system than in the domestic water supply system piping.

IDAPA 02.03.03.962.03.a.iii continues with information on RP valve testing and certification.

The chemigator must assure the RP valve is installed and in operable condition before injecting chemicals into an irrigation system that uses a municipal or domestic water supply.

Manufacturers of chemical injectors that are installed in irrigation systems that use domestic or municipal water as the water source typically list the RP valve as a necessary component of the injector installation.

An alternative to the RP valve is the Air Gap backflow prevention configuration as described in IDAPA 02.03.03.962.03.d:

Air Gap (AG). The water from the domestic water supply system shall be discharged into a reservoir tank prior to the chemical injection. An air gap shall be at least double the diameter of the supply pipe measured vertically above the overflow rim of the vessel – in no case less than one (1) inch. Chemical injection shall not occur upstream of the air gap.

The air gap configuration is typically used in greenhouse chemigation systems.

## Chemical Injection System

The chemical injection system can be a metering pump that is constructed of materials that are compatible with chemicals and capable of being fitted with a system interlock or a Venturi system which must also be constructed of chemically resistant materials.

IDAPA 02.03.03.965 discusses chemical injection systems and states:

All chemical injection systems, except for flood, basin, furrow, or border chemigation through a gravity flow system, shall use:

01. Metering Pump. A metering pump such as a positive displacement injection pump effectively designed and constructed of materials that are compatible with chemicals and capable of being fitted with a system interlock; . . .

Injection pumps that meter the amount of chemical being distributed into irrigation systems by means of moving parts such as diaphragms, impellers, pistons, etc. and are powered by electricity, water pressure or other power sources are considered metering pumps.

IDAPA 02.03.03.965 also discusses Venturi systems and states:

02. Venturi System. Venturi systems including those inserted directly into the main water line, those installed in a bypass system, and those bypass systems boosted with an auxiliary water pump. Booster or auxiliary water pumps shall be connected with the system interlock such that they are automatically shut off when the main line irrigation pump stops, or in cases where there is no main line irrigation pump, when the water pressure decreases to the point where pesticide distribution is adversely affected. Venturies shall be constructed of chemically resistant materials. The line from the chemical supply tank to the Venturi shall contain a functional, automatic, quick closing check valve to prevent the flow of liquid back toward the chemical supply tank. This valve shall be located immediately adjacent to the Venturi chemical inlet. This same supply line shall also contain either a functional normally closed solenoid-operated valve connected to the system interlock or a functional normally closed hydraulically operated valve which opens only when the main water line is adequately pressurized. In bypass systems as an option to placing both valves in the line from the chemical supply tank, the check valve may be installed in the bypass immediately upstream of the Venturi water inlet and either the normally closed solenoid or hydraulically operated valve may be installed immediately downstream of the Venturi water outlet.

Injection equipment that does not depend on electric power, an internal combustion engine or water pressure to operate a diaphragm, piston or other moving part is considered a Venturi system. Pressure differential type injectors are Venturi systems when considered under IDAPA 02.03.03 and must meet Venturi system interlock requirements.

## System Interlock

IDAPA 02.03.03.965.01 states that a metering pump “must be capable of being fitted with a system interlock.” While ISDA encourages manufactures to include the components of the system interlock with the chemical injector, the rule requires that the components must be capable of being fitted with a system interlock as listed in IDAPA. The burden lies on the person using the chemigation system to assure the system interlock is in place and operational.

IDAPA 02.03.03.963 discusses chemical injection line shut down (system interlock) and states:

In every chemigation system, there shall be a functional system interlock designed and installed to shut down the chemical injection unit when chemical distribution is adversely affected. The system interlock shall connect the water supply pump and the chemical injection unit or connect the irrigation line pressure switch and the chemical injection unit if there is no water supply pump and the system is pressurized. The chemical injection line shall contain one (1) of the following options found in Subsections 963.01 through 963.05, to ensure that a chemical injection pump will stop if the irrigation pump stops to prevent the entire chemical mixture from emptying from the supply tank into the irrigation pipeline:

The interlock options discussed in IDAPA 02.03.03.963 are electrical, mechanical, hydraulic, and human.

**Electrical Interlock:** Interlocks irrigation pump with electric powered injection pump (chemical injector).

**Mechanical Interlock:** Interlocks an internal combustion engine driven pump with the injection pump (chemical injector).

**Hydraulic Interlock:** Interlocks main water line pressure with a normally closed, hydraulically operated check valve located in the injection line between the chemical tank and the injection point.

**Human Interlock:** Human supervision on-site during the injection of a chemical into the irrigation system. Injection is limited to less than one (1) hour injection time.

Each of these four system interlocks have their own requirements (i.e. must have an injection line check valve installed, must use solenoid operated valves, pressure switches, etc.). System Interlock requirements can be viewed on pages 26 and 27 of IDAPA 02.03.03, Rules Governing Pesticide and Chemigation Use and Application. Manufacturers of chemical injection equipment should consider which type of system interlock works best for their equipment and design the equipment to accommodate the system interlock.

If an Injection Line Check Valve is installed, as required in IDAPA 02.03.03. 963.01 (Electrical Interlock), -02 (Mechanical Interlock) and -04 (Human Interlock), it must have a minimum of ten (10) psi opening (cracking) pressure plus one (1) psi per foot of chemical tank elevation above the point of chemical injection.

Refer to **IDAPA 02.03.03 964.01.a, b, c, d** for other information concerning the Injection Line Check Valve.

Injection line check valves must meet ISDA approval criteria and be placed on ISDA's list of approved chemigation equipment before being used for chemigation purposes in Idaho. All of ISDA approved check valves have at least a 10 psi cracking pressure and, currently, only one company has an ISDA approved valve that is ¼" inside diameter. The list of approved injection line check valves may be viewed on the ISDA web site at [www.agri.idaho.gov/Categories/Pesticides/Documents/Chemigation/ApprovedChemEquip11-13.pdf](http://www.agri.idaho.gov/Categories/Pesticides/Documents/Chemigation/ApprovedChemEquip11-13.pdf) (page 3).

### Chemigation Licensing

Idaho Code section 22-3401(28) defines a "Private Applicator" as:

[A] person who (a) uses or supervises the use of restricted-use pesticides to produce agricultural commodities or forest crops on land owned or rented by him or his employer; or (b) applies restricted-use pesticides on the property of another without compensation other than the trading of personal services between producers of agricultural commodities; or (c) applies chemicals through irrigation systems on land owned or rented by him or his employer.

Operators of chemical injectors used in residential, school, commercial and municipal irrigation systems fall under the definition of "Private Applicator" if the operator or his employer owns or rents the land being treated. (" . . . (c) applies chemicals through irrigation systems on land owned or rented by him or his employer.")

Anyone who applies chemicals through an irrigation system (including lawn irrigation systems) for compensation would fall under the definition of a "Professional Applicator."

Idaho Code section 22-3401(29) defines "Professional Applicator" as:

[A] person who (a) applies pesticides upon the land or property of another for compensation, or applies chemicals through irrigation systems upon the land or property of another for compensation; . . ."

Compliance with chemigation licensing requirements is the responsibility of chemical injector operators. This licensure is also a concern to chemical dealers (including landscape companies and retail outlet stores) who carry the burden of assuring the person purchasing the product for use in a chemigation system has an ISDA applicator license (Private or Professional) with a chemigation (CH) category.

Idaho Code section 22-3406A states the responsibilities of chemical suppliers;

Any person who supplies or sells at retail a chemical and who knows or has reason to know that the chemical will be applied by chemigation shall sell chemicals only to licensed professional or private applicators with a chemigation category.

ISDA has provided this information to help you understand Idaho's laws and rules as applied to the certification of chemical injection systems for use on irrigation systems and licensing of operators of chemical injection equipment. Our goal is to protect water supplies from contamination by assuring that chemical injectors meet ISDA requirements, operators of chemical injection systems are licensed and that all chemigation laws and rules are followed. If you have questions concerning Idaho chemigation laws and rules, equipment certification, product registration or operator licensure, please contact Jim Childs, ISDA Chemigation Program Specialist at (208) 736-4790 or e-mail your questions to [Jim.Childs@agri.idaho.gov](mailto:Jim.Childs@agri.idaho.gov).