Appendix B. List of Alternative Chemigation Safety Equipment
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As discussed in Unit 5 (Backflow Prevention), the labels of pesticides that may be chemigated must include all required backflow prevention devices. In certain cases, however, approved alternative devices may be used. A list and discussion of this alternative safety equipment follow.

BACKGROUND: In March 1987, the U.S. Environmental Protection Agency issued PR Notice 87-1, a set of rules for improving directions on labels of agricultural pesticides intended for application through irrigation systems. The Notice said that labels of such pesticides must require the use of certain types of safety devices to protect groundwater from pesticide contamination. The Agency later approved alternatives to some of the required devices specified in PR Notice 87-1. The alternative devices, in some situations, may be less expensive, more reliable, or more available than those devices originally required. However, if there is no approved alternative for a required device, then the required device must be used.

Listed below are the original devices specified in PR Notice 87-1 and their corresponding alternatives.

Original Device

Functional normally-closed, solenoid-operated valve located on the intake side of the injection pump.

Alternative Device 1

Functional spring-loaded check valve with a minimum of 10 psi cracking pressure—The valve must prevent irrigation water under operating pressure from entering the pesticide injection line and must prevent leakage from the pesticide supply tank on system shutdown. This valve must be constructed of pesticide-resistant materials. (Note: this single device can substitute for both the solenoid-operated valve and the functional automatic quick-closing check valve in the pesticide injection line.)

Alternative Device 2

Functional normally-closed hydraulically-operated check valve—The control line must be connected to the main waterline such that the valve opens only when the main waterline is adequately pressurized. This valve must prevent leakage from the pesticide supply tank on system shutdown. The valve must be constructed of pesticide-resistant materials.

Alternative Device 3

Functional vacuum-relief valve located in the pesticide injection line between the positive-displacement pesticide injection pump and the check valve—This alternative is allowed only for those chemigation systems using a positive-displacement pesticide injection pump; it is not for use with venturi injection systems. This valve must be elevated at least 12 inches above the highest fluid level in the pesticide supply tank and must be the highest point in the injection line. The valve must open at 6 inches water vacuum or less and must be spring-loaded or otherwise constructed such that it does not leak on closing. It must prevent leakage from the pesticide supply tank on system shutdown. The valve must be constructed of pesticide-resistant materials.

Original Device

Functional main waterline check valve and main waterline low-pressure drain.

Alternative Device 1

Gooseneck pipe loop located in the main waterline immediately downstream of the irrigation water pump—The bottom side of the pipe at the loop apex must be at least 24 inches above the highest sprinkler or other type of water-emitting device. The loop must contain either a vacuum-relief or combination air–and–vacuum-relief valve at the apex of the pipe loop. The pesticide injection port must be located downstream of the apex of the pipe loop and at least 6 inches below the bottom side of the pipe at the loop apex.
Original Device

Positive-displacement pesticide injection pump.

Alternative Device 1

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

Original Device

Vacuum-relief valve.

Alternative Device 1

Combination air–and–vacuum-relief valve.