HERBIGATION - THE APPLICATION OF HERBICIDES THROUGH IRRIGATION SYSTEMS

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Herbigation is an effective method of applying herbicides through irrigation systems. Weed control has been equal or better with herbigation than applications with ground or aerial sprayers. More herbicide registrations and better injection equipment has given the growers greater flexibility in herbigation programs.

Herbigation provides greater flexibility in weed control programs. Aerial application can be restricted because of the close proximity of buildings or adjoining sensitive crops. Wet fields may delay ground applications or cause soil compaction.

The success of good herbigation programs depends upon good management, uniform water applications and a knowledge of the movement of herbicides in the soil. Poorly designed or maintained irrigation systems should not be used for herbicide applications. Crop injury or poor weed control can result if water is not applied uniformly.

Sprinkler irrigation systems should be checked for constant pressure throughout the pipeline, uniform orifice size and sprinkler head type, leaky gaskets and holes in the pipelines.

Surface irrigation fields should be level or graded to a uniform slope. Irrigation borders and furrows should have a uniform height and width.

The movement of herbicides in the soil is an important consideration in herbigation. Some chemical properties that influence herbicide movement includes the absorption capacity for clays and organic matter, water solubility and volitilty. Maximum weed control is obtained when the correct amount of water is applied based on soil type and herbicide properties. Sencor, Amiben and Eptam move easily in the soil water solution and should be applied in small amounts of water. The amount of water applied with Surflan and Sonalan has less influence on the movement. The movement of Lasso, Dual and Furloe is intermediate compared to the previous herbicides.

The amount of water used for herbigation should incorporate the herbicide at a depth to coincide with the depth of the germinating weeds, most small seeded weeds germinate in the upper 2" of soil.

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Observations on a sandy loam sprinkler irrigated tomato field showed 65% of the hairy nightshade plants emerged from a depth of 0.8" - 1.2" and 95% emerged from the area between 0.6" - 1.6". No hairy nightshade plants emerged from a depth of more than 2".

Some herbicides volatilize resulting in a portion of the herbicide lost to the atmosphere. High temperature and windy conditions increase volatility losses. Application can be made at night to reduce the herbicide loss through volatilization.

Good injection equipment is necessary to apply the correct amount of herbicide throughout the irrigation period. Applications in gravity flow surface irrigation systems can be applied through a constant head siphon device using a fixed precision drilled orifice.

In pressurized irrigation lines there are several types of positive-displacement injection pumps that can be used depending on the capacity of the system.

A portable injector system can be attached using a pressurized herbicide tank and a CO_2 cylinder. A coupler with an orifice should be installed between the herbicide tank and the water pipeline to regulate flow.

Precautions should be taken to prevent herbicides from flowing back into the main water source. In pressurized systems, check and vacuum relief valves (anti-siphon devices) should be installed. Check valves, solenoid valves or water pressure valves should be installed to stop the herbicide injection if the irrigated water stops.

In conclusion, herbigation is an excellent method of controlling weeds for the growers with good management, good irrigation systems and good injection equipment.