

Herbicides, Weeds and Rain

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Herbicides and weeds react to rain in several ways. The rains activate the germination of many annual weeds, which is important for root absorption of herbicides. However, rain can affect herbicide performance in both good and bad ways.

Soil-Applied Herbicides (also called Pre-emergent Herbicides)

Generally, soil-applied herbicides such as Chateau, Devrinol Frontier, Dual II Magnum, Lorox, Princep, Prowl and Sencor give better weed control when at least 1/2" of rain falls shortly after application. This moisture dissolves the herbicide in soil water solution so that developing weed seedlings can absorb the herbicides as they take up water. For herbicides sensitive to photodegradation, a good shower will give shallow incorporation.

Soil-applied herbicides can be leached below the weed-seed germination zone by excessive rains, especially if heavy rains fall shortly after application and before herbicides get bound to soil particles.

The effect of leaching depends on the characteristic of the herbicide:

- The layer of herbicide may be washed just below the soil surface, allowing weed seeds to germinate on the surface.
- The layer of herbicide may be diluted from a narrow band (e.g. 1") to a wide band (e.g. 3") which dilutes the concentration where the weeds are germinating.
- The herbicide may be leached below the cropping zone on sandy soils, allowing both shallow and deep seeds to germinate.

If there is low or no herbicide left on the soil surface or in the incorporation layer after a heavy rain, weed control will be significantly reduced.

This information on soil-applied herbicides for horticulture crops is from the Herbicide Handbook, Weed Science Society of America:

Herbicide	Field Half Life (Soil Residual Activity)	Soil Mobility/Leaching	Main Dissipation Route
Chateau (G14)	28 – 42 days	Low leaching potential	Microbial breakdown
Devrinol (G15)	70 days	Slightly leachable (rain required for incorporation)	Highly photodegradable; slowly degraded by soil microbes
Dual II Magnum (G15)	3-5 months	Moderately adsorbed to soil; less leaching potential on higher OM	Microbial breakdown

		soils; moves < 4" deep	
Frontier (G15)	35-42 days	Moderately adsorbed to the soil; less leaching potential on higher OM soils; moves < 4" deep	Microbial breakdown
Lorox (G7)	60 days – 5 months	Linuron leaches most in sand and least in soils high in clay or OM	Microbial breakdown
Princep/Simazine (G5)	60 days	Limited leaching potential; strongly adsorbed to clay particles	Microbial breakdown in high pH soils; hydrolysis in low pH soils
Prowl (G3)	44 days	Strongly adsorbed to clay particles and OM	Photodegradation
Sencor (G5)	30-60 days	Readily leached in sandy soil, intermediate leaching potential on medium textured soils, immobile on clay soils, high OM or low pH; may move with soil run-off	Microbial breakdown
Sinbar (G5)	120 days	Weakly adsorbed to soil particles; moderate to high leaching potential	Microbial breakdown
Treflan (G3)	45 days	Low to negligible leaching potential due to strong adsorption to the soil	Degraded by light and microbial breakdown (more rapid in flooded anaerobic conditions)

Field Half Life – is the time it takes for a certain amount of a pesticide to be reduced by **half**. This occurs as it dissipates or breaks down in the environment. In general, a pesticide will break down to 50% of the original amount after a single **half-life**.

OM = organic matter; G followed by number refers to the herbicide group number

Where soil erosion by water is a problem, any herbicides bound to soil particles will also be moved. Be cautious of higher herbicide residues where ponding and settling has occurred.

If herbicides have moved down in the soil profile, crop injury may increase. Repeat applications are not recommended even if weed escapes appear.