

Turf Herbicide Families and Their Characteristics¹

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INTRODUCTION

Knowing as much as possible about a pesticide being used is essential for obtaining maximum benefit at the lowest cost and least amount of hazard to the applicator and/or the environment. Many publications list herbicides and their specific uses and rates. The objective of this publication is to provide indepth information on herbicide chemistry, mode of action, and fate in the environment. This publication discusses the major turf herbicides, their chemical family, the characteristics of each, and the safety precautions for use. **Additional herbicides, not all of which are currently labelled for use in turf, are included only as a reference.**

HERBICIDE PROPERTIES

Subsequent discussions in the text stress the importance of understanding the physical and chemical properties of herbicides. The properties of specific herbicides influence how they react in plants, soils and the environment.

Water solubility

Water solubility is defined as the maximum concentration of a chemical that will dissolve in pure water at a specific temperature and pH (e.g., how easily it dissolves in water), and is expressed as a percent, ppm or g/100 ml. The following offers conversion tips for determining concentration in terms of ppm.

Solids

1 kilogram (kg) = 1 million milligrams (mg), therefore; 1 mg/kg = 1 ppm

Liquids

1 liter (L) of water weighs 1 kg, therefore;
1 mg/L = 1 ppm and 1 ug/L = 1 part per billion,
1% solution = 1 g/100 ml = 10,000 part per million, and
1 teaspoon per 1000 gallons of water approximates 1 ppm

Ionic (charged) herbicides generally are more water soluble and less volatile than nonionic (neutrally charged) herbicides. The following, Table 1, provides relative solubility rankings depending on actual water solubilities of a compound.

Table 1. Solubility rankings based on water solubilities of a compound

Relative Solubility	Water Solubility (ppm)
Very Soluble	1,000 to 10,000
Moderately Soluble	100 to 1,000
Low Solubility	10 to 100
Very Low Solubility	1 to 10
Extremely Low Solubility	0.1 to 1

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