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PROTECT
Use Pesticides Safely

PESTICIDES NO. 15
October 2004

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PESTICIDE ADSORPTION AND HALF-LIFE

This chart lists the soil adsorption coefficient (K oc) and soil half-life ($T_{1/2}$) for commonly used pesticides. The soil adsorption coefficient can be considered an index for pesticide mobility, but one must also take into account the pesticide's half-life. For instance, the first three pesticides have relatively low soil adsorption coefficients, which implies that they have the potential to leach. However, they also have short half-lives so generally they do not last long enough in the soil to reach ground water. These numbers are useful for comparing relative differences between pesticides and should not be construed as absolute values.

Common Name/Trade Name	Soil Adsorption Coefficient (µg/g) *K oc	Half-life (days) **$T_{1/2}$
acephate/Orthene	2	3
dicamba/Banvel	2	14
methamidophos/Monitor	5	6
picloram/Tordon	16	90
2,4-D/Weedone	20	10
dimethoate/Cygon, Dimate	20	7
carbofuran/Furadan	22	50
oxamyl/Vydate	25	4
aldicarb/Temik	30	30
bromacil/Hyvar	32	60
1,3-dichloropropene/Telone	32	10
bentazon/Basagran	34	20
metalaxyl/Apron	50	70
hexazinone/Velpar	54	90
terbacil/Sinbar	55	120
ethoprop/Mocap	70	25
methomyl/Lannate	72	30
tebuthiuron/Spike	80	360

*The larger the K oc, the more strongly the pesticide is held to soil organic matter and the less likely it will leach. The K oc value represents the adsorption of the pesticide on the soil normalized by the organic matter to provide a single representation of a particular pesticide for all soils. For this reason, the uncertainty could be plus or minus twice the listed value.

**Half-life is the period of time it takes for one-half of the amount of pesticide in the soil to degrade. Each half-life that passes reduces the amount of pesticide present in the soil by one-half, i.e. 1 to 1/2 to 1/4 to 1/8 to 1/16, etc. Half-life can vary due to soil microbial populations, soil moisture, soil temperature, and other factors. These numbers represent a typical value from the scientific literature. Nonpersistent pesticides have a half-life of 30 or less days, moderately persistent pesticides have a half-life of 31 to 99 days, and persistent pesticides have a half-life greater than 100 days.

Common Name/Trade Name	Soil Adsorption Coefficient (µg/g) *K oc	Half-life (days) **$T_{1/2}$
atrazine/Aatrex	100	60
acifluorfen/Tackle	113	14
simazine/Princep	130	60
prometon/Pramitol	150	500
alachlor/Lasso	170	15
captan/Orthocide	200	3
EPTC/Eradicane	200	6
metolachlor/Dual	200	90
carbaryl/Sevin	300	10
linuron/Lorox	400	60
diuron/Karmex	480	90
terbufos/Counter	500	5
norflurazon/Solicam, Predict	600	90
oryzalin/Surflan	600	20
azinphos-methyl/Guthion	1,000	10
diazinon/Knox-Out, D.Z.N.	1,000	40
phorate/Thimet	1,000	60
chlorothalonil/Bravo, Daconil	1,380	30
malathion/Cythion, Fyfanon	1,800	1
benomyl/Benlate	1,900	240
ethalfluralin/Sonalan, Curbit	4,000	60
fenvalerate/Ectrin	5,300	35
fluazifop-p-butyl/Fusilade	5,700	15
chlorpyrifos/Lorsban	6,070	30
trifluralin/Treflan, Tri-4	8,000	60
diclofop-methyl/Hoelon	16,000	37
glyphosate/Roundup	24,000	47
paraquat/Gramoxone	1,000,000	1,000

Source: SCS/ARS/CES, USDA, Pesticide Properties Database for Environmental Decision-Making, August 10, 1994.

PRECAUTIONARY STATEMENT

All pesticides have both benefits and risks. Benefits can be maximized and risks minimized by reading and following the labeling. Pay close attention to the directions for use and the precautionary statements. The information on pesticide labels contains both instructions and limitations. Pesticide labels are legal documents and it is a violation of both federal and state laws to use a pesticide inconsistent with its labeling. The pesticide applicator is legally responsible for proper use. Always read and follow the label.

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