

PSEP Fact Sheet:**Pesticide
Adsorption
and Half-Life**

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This chart lists the soil adsorption coefficient (Koc) and soil half-life (T_{1/2}) for commonly used pesticides. A soil adsorption coefficient can be considered an index for pesticide mobility, but one must also take into account a pesticide's half-life. For instance, the top three pesticides in the table below 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 persist long enough in the soil to reach ground water. Chart numbers are useful for comparing relative differences between pesticides and should not be construed as absolute values.

The larger the Koc, the more strongly a pesticide is held to soil organic matter and the less likely it will leach. The Koc value represents the adsorption of a pesticide on soil normalized by 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 soil to degrade. Each half-life that passes reduces the amount of pesticide present in 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 temperatures, and other factors. These numbers represent typical values from scientific literature. Non-persistent pesticides have a half-life of 30 days or less, moderately persistent pesticides have a half-life of 30 to 99 days, and persistent pesticides have a half-life greater than 100 days.



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Common Name/ Trade Name	Soil Adsorption Coefficient (µg/g) Koc	Half- Life (Days) T ½
acephate/Orthene	2	3
dicamba/Banvel	2	14
methamidophos/Monitor	5	6
picloram/Tordon	16	90
2,4-D/Weedon	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-dichloropropen/Telone	32	10
bentazon/Basagran	34	20
metalaxyl/Apron	50	70
hexazinone/Velpar	54	90
terbacil/Sinbar	55	120
ethopropo/Mocap	70	25
methomyl/ Lannate	72	30
tebuthiuron/Spike	80	360
atrazine/Aatrex	100	60
acifluorfen/Tackle	113	14
simazine/Princep	130	60
prometon/Pramitol	150	500
alachlor/Lasso	170	15
cyanazine/Bladex	190	14
captan/Orthocide	200	3
eptc/Eradicane	200	6

Common Name/ Trade Name	Soil Adsorption Coefficient (µg/g) Koc	Half- Life (Days) T ½
metolachlor/Dual	200	90
carbaryl/Sevin	300	10
linuron/Lorox	400	60
diuron/Karmex	480	90
terbufos/Counter	500	6
norflurazon/Solicam	600	90
oryzalin/Surflan	600	20
fonofoa/Dyfonate	870	40
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
ethalfuralin/Sonalan, Curbit	4,000	60
fenvalerate/Ectrin	5,300	35
fluzzifop-p-butyl/Fusiland	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, Pesticide Properties database for Environmental Decision Making, August 10, 1994.

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