

Toxicity Category & Signal Word on Label	LD50 Oral (mg active ing. per kg body weight)	LD50 Dermal (mg active ing. per kg body wt.)
I DANGER POISON	0 to 50	0 to 200
II WARNING	>50 to 500	>200 to 2,000
III CAUTION*	>500 to 5,000	>2,000 to 20,000
IV none*	>5,000	> 20,000

* Category IV material may have Caution signal word due to skin irritation or other hazard.

In addition to oral or dermal acute toxicity, a pesticide may also carry the **DANGER — POISON**, **DANGER**, or **WARNING** signal words because of other potential hazards, such as inhalation toxicity or the ability to cause severe eye or skin damage

LABEL COMPLIANCE

Under the present EPA regulations, pesticides may be applied:

- at a different rate per 100 gallons dilute than stated on label as long as the application stays within the dose per acre limit;
- at a lower rate per acre than on label; and
- less frequently than on label.

IMPORTANT — it is illegal to:

- increase amount applied per acre (overdosage);
- use shorter intervals between sprays than minimum interval stated on label; and
- shorten intervals to harvest (illegal residues on crop).

State regulations may be more restrictive than those of the EPA.

PROTECTING WATER QUALITY

Apple growers have a responsibility to prevent pesticide from contaminating surface bodies of water and groundwater supplies. Over 90% of the rural population in the U.S. depends on groundwater as their supply of drinking water. Groundwater is very difficult to clean if it does become polluted. Listed below are a few practices that can help prevent water contamination. Contact Extension for more information.

- Consider the potential for rinse water, spills, application or erosion to create pesticide laden run-off which can reach a surface body of water. If you do not have a self-contained mixing pad, use an area where the run-off risk is low. If you are working near a stream or pond, do not allow run-off to occur.

- Use an anti-backflow device when filling the spray tank.
- Periodically change the location of field mixing areas. Be aware of the location and condition of wells, stay at least 50 feet away from wells. Special caution is needed around wells with cracked casings.
- Be aware of the soil types, geology, and depth of water table in your local area. The potential for pesticide leaching into groundwater is generally greater on ledge, sandy soils, or other soils low in organic matter. The risk increases when the water table is close to the surface. Try to choose pesticides with a low leachability hazard if you are working under these conditions.
- Keep spray equipment accurately calibrated.
- Use proper procedures for pesticide storage and disposal. Keep pesticide storage and mixing areas away from streams, ponds, and springs.

RESTRICTED ENTRY INTERVAL

The REI values listed in Table 10 are the best information available as of November 2002.

Manufacturers may write the label with a longer REI than required by the EPA, or the EPA may change its minimum REI requirement. To know the use restrictions for a pesticide you must READ THE LABEL!

PESTICIDE RESIDUE TOLERANCES

Federal laws warn that food shipments bearing residues of pesticide chemicals in excess of established tolerances will be contraband and subject to seizures as “adulterated.” This applies to both raw and processed foods.

The amount of pesticide residue in or on a food material at harvest must fall into established tolerances, expressed in “parts per million” (ppm). The actual amount of pesticide chemical found in a food at harvest depends in part on the amount applied to the crop and the length of time since the last application. Therefore, growers are responsible for strictly following label information as to:

- maximum spray dosage, and
- the preharvest interval: which is time between the final pesticide application and harvest.

The FDA advises pesticide users to follow directions on recently registered labels, so they do not exceed the residue tolerance for any material. Use the following table as a general guide, but verify the preharvest interval by checking the label before using the product. Table 10 refers to use on apples only.

Table 10 – Restricted Entry Intervals and Preharvest Intervals (from 2002 labels).

Code letters for Early Entry Personal Protective Equipment (PPE)				
A = Long sleeved shirt and long pants		G = Chemical resistant footwear and socks		
B = Waterproof gloves		H = Protective eyewear		
C = Shoes plus socks		J = Chemical resistant headgear for overhead exposure		
D = Coveralls over short-sleeved shirt and short pants		K = Coveralls		
E = Coveralls over long-sleeved shirt and long pants		L = Dust/mist filtering respirator with		
F = Chemical resistant gloves		MSHA/NIOSH approval prefix TC-14G		
LABELS MAY CHANGE AT ANY TIME. ALWAYS CHECK LABEL FOR CORRECT PERSONAL PROTECTIVE EQUIPMENT.				
CHEMICAL	LABELS REVIEWED	RESTRICTED ENTRY INTERVAL	APPLE PREHARVEST INTERVAL	EARLY ENTRY PPE*
Fungicides and Bactericides				
basic copper sulfate	Basicop	24 hours other basic copper sulfate products - see label.	not after bloom	see labels at least BCHKJ
captan	Captan, Captec	96 hours (48 with protective equipment)	0	BCHK
copper hydroxide	Kocide, Champ	24 hours other copper hydroxide products - see label	Not after 1/4" green	see labels at least BCHKJ
copper oxychloride sulfate	COCS	24 hours	Not after bloom	see labels
cyprodinil	Vangard	12 hours	72 days	BCK
dodine	Syllit	48 hours	7 days	BEGHJ
fenarimol	Rubigan	12 hours	30 days	EFGHJ
ferbam	Ferbam Granuflo	24 hours	7 days	BCHJK
fosetyl Al	Aliette	12 hours	nonbearing: 12 months bearing: 14 days	BCHK
kresoxim-methyl	Sovran	12 hours	30 days	BCE
mancozeb	Dithane, Manzate, Penncozeb	24 hours	77 days (Extended prog.)	BCEJ
maneb	Maneb, Manex	24 hours	77 days (Extended prog.)	BCE
metalaxyl	Ridomil	48 hours	see label	CFK
metiram	Polyram	24 hours	77 days (Extended prog.)	BCE
myclobutanil	Nova	24 hours	14 days	CFHK
streptomycin	AgriMycin	12 hours	50 days	BEFG
sulfur	Sulfur 6L	24 hours for other sulfur products, see label.	0	BCHJK
thiabendazole	Mertect 340 - F	12 hours	0	BCE
thiophanate methyl	Topsin M	12 hours	0	BCKJ
thiram	Thiram	24 hours	0	ABCJ
triadimefon	Bayleton	12 hours	45 days	BCFJK
triflumizole	Procure	12 hours	14 days	BCK
trifloxystrobin	Flint	12 hours	14 days	BCFJK
ziram	Ziram	48 hours	14 days	BCHKJ

Table 10 continued – Restricted Entry Intervals and Preharvest Intervals (from 2002 labels).

CHEMICAL	LABELS REVIEWED	RESTRICTED ENTRY INTERVAL	APPLE PREHARVEST INTERVAL	EARLY ENTRY PPE*
Growth Regulators				
AVG	ReTain	12 hours	28 days	BCK
benzyladenine	Accel	12 hours	not limited	BCHK
ethephon	Ethrel	48 hours	7 days	AFGHJK
promalin	Promalin	4 hours	see label	BCK
NAA	Fruitone-N, K-Salt Fruit Fix	Fruitone-N: 48 hours K-Salt Fruit Fix: 24 hours	Fruitone-N: 5 days K-Salt Fruit Fix: 2 days	see label
NAD	Amid-thin	48 hours	not more than 18 days after full bloom	BCK
Herbicides				
basamid	Basamid Granular	24 hours	365 days	see label
dichlobenil	Casoron	12 hours	0	BCK
diuron	Karmex DF, Direx	12 hours	0	BCK
fluazifop	Fusilade DX L	12 hours	365 days	CFK
glufosinate–ammonium	Rely L	12 hours	14 days	CFHK
glyphosate	Roundup Ultra	4 hours	1 day	BCK
	Roundup Original	12 hours	1 day	BCHK
napropamide	Devrinol	12 hours	35 days	see label
norflurazon	Solicam	12 hours	0	BCK
oryzalin	Surflan AS	12 hours	0	CFK
oxyfluorfen	Goal 2 XL	24 hours	0	DFGHJ
paraquat	Gramoxone Extra L	24 hours	0	BCHK
pendimethalin	Prowl 3.3EC	24 hours	0	CFK
pronamide	Kerb 50W	24 hours	0	BDGJ
sethoxydin	Poast L	12 hours	14 days	DFGHJ
simazine	Princep Caliber 90DF Simazine 4L, Simazine 90DF	12 hours	0	BCK
sulfosate	Touchdown 6	12 hours	365 days	BCK
	Touchdown 5	12 hours	13 days	BCK
terbacil	Sinbar W	12 hours	60 days	CFK
2,4-D	Amine 4	48 hours	14 days	BDGHJ
	Saber	48 hours	14 days	CFHK
Insecticides and Miticides				
abamectin	Agri-Mek	12 hours	28 days	DFGHJ
acetamiprid	Assail	12 hours	7 days	BCK
azadirachtin	Neemix	4 or 12 hours	0	CFK or CFHK **

Table 10 continued – Restricted Entry Intervals and Preharvest Intervals (from 2002 labels).

CHEMICAL	LABELS REVIEWED	RESTRICTED ENTRY INTERVAL	APPLE PREHARVEST INTERVAL	EARLY ENTRY PPE*
Insecticides and Miticides (Continued)				
azadirachtin	Aza-Direct	4 hours	0	ABC
azinphosmethyl	Guthion, Azinphos-M			BEGHJ
	REI is 14 days for hand thinning, hand harvesting. 48 hours for less intensive activities. PHI is 14 or 21 days, depending on amount of active ingredient used in final application.			
<i>Bacillus thuringiensis</i> endotoxin	Agree, Dipel, Javelin, MVP, Xentari	4 hours	0	BCK
bifenazate	Acramite	12 hours	7 days	CK
carbaryl**	Carbaryl 4F, Sevin XLR Sevin 80SP	12 hours	1 or 3 days	4F=BCK, XLR=CFJK 80SP=BCJK
chlorpyrifos	Lorsban 4E (foliar) Lorsban 50WP (foliar) Lorsban 4E & 50W (trunk)	4 days 4 days 4 days	Not after Bloom Not after Bloom 28 days	DFGHJ BCHJK BCHJK
cinnamaldehyde	Valero	4hours	0	BCK
clofentezine	Apollo	12 hours	45 days	CFK
diazinon	Diazinon 50W DZNAG600	24 hours 24 hours	21 days Not after petal fall	BCK BCK
dicofol	Kelthane 50	48 hours	7 days	BCHK
dimethoate	Dimethoate, Digon	48 hours	28 days	FGHJK
endosulfan	Thiodan, Phaser	24 hours	21 days	EFGHJ
esfenvalerate	Asana	12 hours	21 days	CFHK
fenbutatin oxide	Vendex	48 hours	14 days	CFHK
fenpropathrin	Danitol	24 hours	14 days	CFHK
formetanate HCl	Carzol		Not after petal fall	EFGHJ
	Carzol REI is 4, 6, or 10 days depending on the activity (see label)			
hexythiazox	Savey	12 hours	28 days	ABC
imidacloprid	Provado	12 hours	7 days	BCK
indoxacarb	Avaunt	12 hours	28 days	EFG
insecticidal soap	M-pede	12 hours	0	BCK
kaolin clay	Surround	4 hours	0	AC
methidathion	Supracide	See label	Not after 1/2" green	CFHK
methomyl	Lannate	72 hours	14 days	CFHK
methoxyfenozide	Intrepid	4 hours	14 days	BEG
oil**	Spray Oil - Various products	4 or 12 hours	Varies by product	Varies by product
oxamyl	Vydate	48 hours	14 days	DFGHJ
permethrin	Ambush, Pounce	12 hours	Not after petal fall	CFK, BCHK, CFHK**
phosmet	Imidan	24 hours	7 days	BCJK
pyrethrin	Pyrenone	12 hours	0	CFK
pyrethrin & rotenone	Pyrellin E.C.	12 hours	12 hours	CFK
pyridaben	Pyramite	12 hours	25 days	BCHJK
pyriproxyfen	Esteem	12 hours	45 days	DFGJ
rotenone	Rotenone	12 or 24 hours	0	see label
spinosad	SpinTor, Entrust	4 hours	7 days	BCK
tebufenozide	Confirm	4 hours	14 days	BGK
thiamethoxam	Actara	12 hours	See label	CFK

** PPE is formulation dependent