CARZOL GRANTED SPECIAL LOCAL NEED REGISTRATION FOR GREENHOUSE USE IN NORTH CAROLINA

The agricultural pesticide Carzol SP has been labeled for citrus, apples, pears, peaches, plums, and nectarines for some time. Carzol SP is labeled for thrips, red mite, rust mite, tentiform leafminer, white apple leafhopper, European red mite, twospotted spider mite, lygus bugs, stink bugs, McDaniel mite, and consperse stink bug. On October 6, 1988, the North Carolina State Department of Agriculture granted a 24(c) (special local need) registration of Carzol SP to control western flower thrips in commercial greenhouses in North Carolina.

TOXICITY - Carzol SP is a 92% active ingredient soluble powder which is used at 8 ounces per one hundred gallons of water. The hazard signal words on the Carzol SP label are DANGER-POISON (PELIGRO-VENENO). Carzol SP is very toxic orally - about as toxic as Lannate and Vydate and somewhat less toxic than Temik 10G. Table 1 compares the oral and dermal toxicity of various greenhouse insecticides and miticides. The relative toxicities are listed as LD_{50}'s, doses needed to kill 50% of the rats or rabbits in a test. It sounds sort of cruel, but companies are required to test their products by poisoning animals at various rates until the dose which kills half of a treated population can be computed. The doses are given as milligrams of chemical per kilogram of body weight of the test animal. Oral toxicities are usually reported for rats and dermal toxicities for rabbits. The presumption is that rats and rabbits are similar to humans in their susceptibility to pesticide poisoning. That may not be the case, but it is difficult to get humans to volunteer for poisoning experiments! With Carzol SP, the oral toxicity for rats is 20 mg/kg. This means that a dose of 0.05 ounces of Carzol SP would kill half of a population of 150 pound men who swallowed it. Some people may be very sensitive to the pesticide, and others would be more tolerant.

Carzol SP is a carbamate insecticide (the same chemical group as Dycarb, Ficam, Lannate, Sevin, Temik 10G, Oxamyl 10G, and Vydate. Atropine is the antidote (in case of a poisoning, be sure to take a Carzol SP label to the hospital with the victim).

DIRECTIONS FOR USE - To use Carzol SP legally in the greenhouse, you must follow the label directions. To do that, you must have a copy of the federal label and the North Carolina 24(c) label. Remove the inserted label from your Flower Growers Bulletin and firmly attach it to the pesticide container. You must have a copy of the label to apply this (or any) pesticide legally. You may copy the label if you have more than one package on hand.

Because of its acute oral toxicity, the material safety data sheet and the federal label require a self-contained breathing apparatus to be worn when exposed to the dust or spray mist of Carzol SP. Goggles, rubber gloves, and protective clothing must also be worn. The section North Carolina 24(c) registration requires that goggles and a pesticide respirator approved jointly by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health under the provisions of 30 CFR Part II be worn.

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REENTRY - Reentry into areas treated with Carzol SP is prohibited until the leaves are completely dry or until 24 hours after application. Do not enter recently treated areas without protective clothing. Written or oral warnings must be given to workers who are expected to be in a treated area.

PHYTOTOXICITY - Carzol is known to be phytotoxic to certain cultivars of chrysanthemum. 'Royal Trophy' first develops a marginal chlorosis and then necrotic spots form on the leaf margins. This variety has purple flowers. Carzol SP does not seem to damage the blossoms. The yellow daisy 'Rejoice' is also reported to be sensitive to Carzol as are the varieties 'Champ' and 'Golden Champ.' Be sure to try Carzol SP on a limited number of plants of each variety before treating a large number in case of phytotoxicity problems.

Table 1. A comparison of the oral and dermal toxicities of insecticides, miticides, and molluscicides used for pest management on ornamental crops in the greenhouse.

Pesticide	Oral LD_{50} mg/kg	Dermal LD_{50} mg/kg
Temik 10G	7 (rat)	>2000 (rat), dry
Dithio	7-10 (rat)	not available
Lannate	17-24 (male-female rat)	5880 (male rabbit)
Carzol SP	20 (rat)	5600 (rat), >10,200 (rabbit)
Thiodan	30-70 (rat)	359 (rabbit)
Vydate	37 (male rat)	2960 (male rabbit)
Nicotine	50-60 (rat)	not available
lindane	88-125 (male rat)	1000 (male rat)
Dursban	96-270 (rat), 504 (g. pig)	2000 (rabbit)
Dycarb, Ficam	179 (rat)	>1000 (rat)
Sevin	246-283 (female-male rat)	not available
metaldehyde	250-1000, 630 (dog, rat)	not available
Mavrik	261-282 (rat)	>20,000 (rat/rabbit)
Talstar	375 (rat)	>2000 (rabbit)
ethion	400 (rat)	2300 (rabbit)
Dibrom	430 (rat)	1100 (rabbit)
Avid	650 (rat)	2000 (rabbit)
Orthene	866-945 (female-male rat)	>10,250 (rabbit)
malathion	1000-1375 (female-male rat)	4100 (rabbit)
pyrethrins	1500 (rat)	>1800 (rat)
Morestan	1520-2070 (rat)	>2000 (rat)
Omite, Ornamite	2200 (rat)	not available
Vendex	2631 (rat)	>2000 (rabbit)
Pentac	3160 (rat)	>3160 (rabbit)
Ambush, Pramex	>4000 (rat)	>4000 (rat), >2000 (rabbit)
SPB1382	4240 (rat)	2500 (rabbit)
Sumithrin	>10,000 (rat)	>10,000 (rat)
Knox Out 2 FM	21,000	not available
Vectobac, Dipel	harmless	harmless
Insecticidal Soap	harmless	harmless