

Copper Fungicides for Organic Disease Management in Vegetables.

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There are several different copper fungicides approved for use in organically-produced crops. Copper fungicides are important tools for managing diseases that cannot be effectively managed with cultural practices alone. They have broad-spectrum activity, acting on bacteria as well as fungi. Following many years of use, there is a lot more information on efficacy of copper fungicides than the newer biological products. Manufacturers of some biologicals recommend that they be used in a management program with copper fungicides (often in alternation or at low label rate). Thus it appears copper fungicides will continue to be important for managing diseases. Copper fungicides differ in their active ingredient, use rate, re-entry interval, and the amount of copper. Copper is an inorganic compound thus it does not breakdown like organic compounds and consequently copper can accumulate in soil when used intensively. Plants take up some copper from soil because it is a micronutrient. Similarly, humans need a small amount of copper in their diets. Metallic copper equivalent (MCE) is a commonly used measure of the quantity of copper in fungicides.

The specific directions on fungicide labels must be adhered to. They supersede these recommendations (above), if there is a conflict. Check state registration and organic approval before using a product. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended.

Highest label rate of organic copper fungicides for some vegetable crops.

Product	Active ingredient	Metallic copper equivalent	Maximum Labeled Rate (MCE in lbs)				REI	PHI
			Broccoli	Lettuce	Squash	Tomato		
Badge X2	24% copper oxychloride + 21% copper hydroxide	28%	0.75 lb/A (0.21)	1.75 lb/A (0.49)	1.25 lb/A (0.35)	1.75 lb/A (0.49)	48 hr	0 day
Basic Copper 53	98% basic copper sulfate	53%	3 lb/A (1.59)	3 lb/A (1.59)	2 lb/A (1.06)	4 lb/A (2.12)	24 hr	0 day
Camelot	58% copper salts of fatty and rosin acids	5.14%	0.75 pt/A (0.05)	3 pt/A (0.22)	3 pt/A (0.22)	3 pt/A (0.22)	12 hr	0 day
Champ WG	77% copper hydroxide	50%	2 lb/A (1.0)	Not labeled	3 lb/A (1.5)	4 lb/A (2.0)	24 hr	0 day
CS 2005	19.8% copper sulfate pentahydrate	5%	25.6 oz/A (0.8)	Not labeled	25.6 oz/A (0.8)	32 oz/A (1.0)	48 hr	0 day
Cueva	10% copper octanoate	1.8%	1 gal/A (0.15)	1 gal/A (0.15)	1 gal/A (0.15)	1 gal/A (0.15)	4 hr	0 day
Nordox 75	84% cuprous oxide	75%	2 lb/A (1.5)	1.25 lb/A (0.94)	1.25 lb/A (0.94)	2.5 lb/A (1.88)	24 hr	0 day
NuCop HB	77% copper hydroxide	50%	1 lb/A (0.5)	1 lb/A (0.5)	1.25 lb/A (0.63)	2 lb/A (1.0)	24 hr	1 day

* MCE = Metallic copper equivalent. REI = Re-entry interval. PHI = Pre-harvest interval. Most labels do not state minimum time after an application that harvest can be done; however, the REI for Worker Protection Standard affects harvest.