



COPPERCIDE

CONTROL OF LATE BLIGHT AND EARLY BLIGHT IN POTATOES

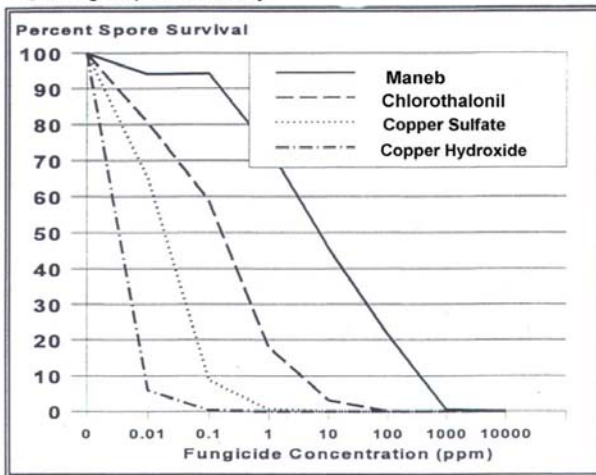


COPPERCIDE:

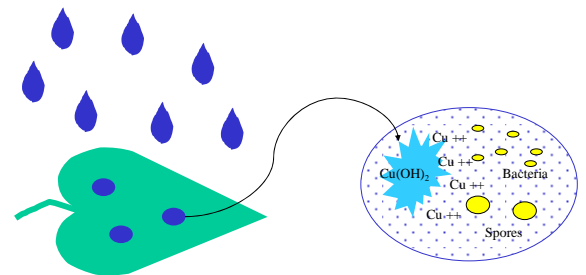
Applied at top kill effectively reduces tuber infection of Late Blight

- Copper hydroxide's needle like particles adhere to waxy leaf surfaces and stems.
- Particles dry more quickly than other copper products, therefore is more resistant to washing off and has longer residual activity.
- Broad-spectrum protective fungicide controlling late blight (all strains) and early blight.
- Contact action effectively kills spores.
- When used just prior to harvest it protects green tissue and creates a barrier between the developing tubers and the late blight spores preventing tuber infection.
- Coppercide disrupts the function of enzymes and energy transport systems, it disrupts the integrity of cell and organelle membrane reducing sporulation.
- Offers alternate mode of action to other products on the market (Mancozeb, Chlorothalonil, Cymoxanil, etc).
- Can be mixed with mancozeb products such as PENNCOZEB for in-season sprays.

Late Blight spore kill assay



Data courtesy of Dr. Gary Secor and Dr. Neil Gudmestad, North Dakota State University. *P. infestans* (US8) sporangial concentrations of 20,000/ml were exposed to ten-fold dilutions from 10,000 to 0.01ppm of each fungicide. Sporangia-fungicide mixtures were incubated at 8C for two hours prior to determining the number of living zoospores.



Copper hydroxide particles stay bound to the leaf surface longer releasing biologically active copper ions into solution over time.

In the above graph, Dr G. Secor and Dr. N Gudmestad show that Copper Hydroxide (Coppercide), when used at top kill time, will effectively kill more spores at lower rates than other common blight control products on the market.

COPPERCIDE (Copper Hydroxide) is available from UAP Canada can be used as a protective fungicide for both Potato Late and Early Blight. Use **COPPERCIDE** at a rate of 1.1 to 2.25 kg/ha, depending on the density of the foliage, combined with 1.75 to 2.25 kg/ha of a Mancozeb product such as Penncozeb. **COPPERCIDE** at 3.4 kg/ha may be applied at vinekill with a desiccant or after vinekill prior to harvest. This late treatment may reduce infection by late blight fungus during harvest. Do not apply within one day of harvest. COPPERCIDE used at top kill time offers sporadic activity as part of a comprehensive blight program.

Potato Late Blight and Early Blight

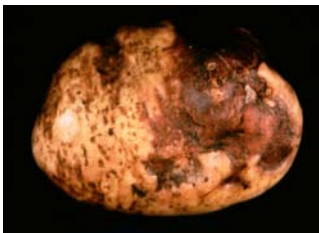
Late Blight (*Phytophthora infestans*) attacks both potato tubers and foliage during any stage of development. Symptoms first occur as small, light to dark green circular to irregular shaped water soaked marks generally on the lower leaves. Lesions form near leaf tips and edges where dew remains the longest. These lesions will produce a white mildew-like growth on the underside of the leaves with a pale yellow to green border around the lesions. The mildew produce spores with a distinctive size and shape borne on stalks which will spread the disease. A distinctive odour is present when late blight has infected a field.



Tubers infected with **Late Blight** have irregular shaped depressed areas that are brown or purplish. Tissue under the skin has a reddish brown dry and granular rot about 1cm deep.

Spores survive on living tissue in storage or over-wintering tubers missed at harvest or in cull piles. Spores are transmitted by wind. Night temperatures of 10-15°C (daytime 15-20°C) with moisture, rain, dew, irrigation or a relative humidity of above 90% is ideal for disease spread. Spores require moisture to germinate into the tuber, a 10 hour wetting period is needed for infection to occur. The **Late Blight** fungus forms a white mildew on the edge of the lesions mainly on the underside of the leaves. Many cycles may occur in one season. Tubers are often infected by spores being washed from the leaves to the soil surface.

Early Blight (*Alternaria solani*) occurs in hot climates especially when irrigation is used. The disease is more severe on maturing or nutritionally deficient potato vines. Symptoms first appear on the lower portion of the plant (older leaflets). Lesions start as small dark brown to black spots. As these spots increase in size they develop concentric rings of raised and depressed necrotic tissue causing a “target spot” appearance. Lesion margins are angular with chlorotic halo around the spot. Leaves turn yellow and either dry up or fall off the plant.



Early Blight occurs less frequently in tubers. It takes several months in storage for dark sunken irregular shaped lesions to form on the tuber. These lesions have violet borders with flesh under the lesion being brown, dry, and leathery.

FOR FURTHER INFORMATION CONTACT YOUR LOCAL RETAILER OR UAP CANADA REPRESENTATIVE. VISIT www.uap.ca FOR COMPLETE LABEL AND MSDS

Always read and follow label directions.

Coppercide is manufactured by United Agri Products. All other products are registered by their respective companies
Photo source: North Dakota State University website. July 17, 2006