

# COPPER-Z 4/4

Algicide/Herbicide

ACTIVE INGREDIENTS:	(BY WT.)
Copper Sulfate Pentahydrate .....	15.9%
OTHER INGREDIENTS .....	84.1%
TOTAL .....	100.0%

Copper (Cu) as metallic ..... 4%  
One gallon contains 0.39 lbs. of metallic copper.

<p style="text-align: center;"><b>KEEP OUT OF REACH OF CHILDREN</b> <b>DANGER – PELIGRO</b> Si usted no entiende la etiqueta, busque a alguien par que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.) <b>PRECAUTIONARY STATEMENTS</b> <b>HAZARDS TO HUMANS AND DOMESTIC ANIMALS</b> <b>DANGER</b> Corrosive. Causes irreversible eye damage. Harmful if swallowed. Harmful if absorbed through skin. Do not get in eyes, on skin or on clothing.</p>
<b>FIRST AID</b>
<b>IF IN EYES:</b> <ul style="list-style-type: none"><li>• Hold eyelid open and rinse slowly and gently with water for 15-20 minutes.</li><li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li><li>• Call a poison control center or doctor immediately for treatment advice.</li></ul>
<b>IF ON SKIN OR CLOTHING:</b> <ul style="list-style-type: none"><li>• Take off contaminated clothing.</li><li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li><li>• Call a poison control center or doctor immediately for treatment advice.</li></ul>
<b>IF SWALLOWED:</b> <ul style="list-style-type: none"><li>• Call a poison control center or doctor immediately for treatment advice.</li><li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li><li>• Have a person sip a glass of water if able to swallow.</li><li>• Do not give anything to an unconscious or convulsing person.</li></ul>
<b>HOT LINE NUMBER</b>
Have the product container or label with you when calling a poison control center or doctor or going for treatment. Call a poison control center or doctor for further treatment advice. In case of emergency, call ChemTrec at 1-800-424-9300.
<b>Note to Physician:</b> Probable mucosal damage may contraindicate the use of gastric lavage.
See Below For Additional Precautionary Statements.

EPA REG. NO.: 5905-486  
EPA EST. NO.: 550-TX-10

AD 020212-A  
NET CONTENTS: 2.5 Gallons (9.46 Liters)

Manufactured For  
HELENA CHEMICAL COMPANY  
225 SCHILLING BOULEVARD, SUITE 300  
COLLIERVILLE, TENNESSEE 38017

## PERSONAL PROTECTIVE EQUIPMENT

Applicators and other handlers must wear:

- Long-sleeved shirt
- Long pants
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks
- Protective eyewear

Some materials that are chemical-resistant to this product are made of any waterproof material. If you want more options, follow the instructions for category A on an EPA chemical-resistant category selection chart.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

## ENGINEERING CONTROLS

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

## USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.
- Wash outside of gloves before removing.

## ENVIRONMENTAL HAZARDS

**For terrestrial uses:** This pesticide is toxic to fish and aquatic invertebrates and may contaminate water through runoff. This product has a potential for runoff for several months or more after application. Poorly draining soils and soils with shallow water tables are more prone to produce runoff that contains this product. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas.

Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate.

**For aquatic uses:** This pesticide is toxic to fish and aquatic invertebrates. Waters treated with this product may be hazardous to aquatic organisms. Treatment of aquatic weeds and algae can result in oxygen loss from decomposition of dead algae and weeds. This oxygen loss can cause fish and invertebrate suffocation. To minimize this hazard, do not treat more than 1/2 of the water body to avoid depletion of oxygen due to decaying vegetation. Wait at least 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State or local agency with primary responsibility for regulating pesticides before applying to public waters, to determine if a permit is required.

Certain water conditions including low pH ( $\leq 6.5$ ), low dissolved organic carbon (DOC) levels (3.0 mg/L or lower), and "soft" waters (i.e., alkalinity less than 50 mg/L), increases the potential acute toxicity to non-target aquatic organisms.

For applications in waters destined for use as drinking water, those waters must receive additional and separate potable water treatment. Do not apply more than 1.0 ppm as metallic copper in these waters

## PHYSICAL OR CHEMICAL HAZARDS

Do not use, pour, spill or store near heat or open flame.

## CHEMIGATION PROHIBITION

Do not apply this product through any type of irrigation system.

## SPRAY DRIFT MANAGEMENT

A variety of factors including weather conditions (e.g., wind direction, wind speed, temperature, relative humidity) and method of application (e.g., ground, aerial, airblast, chemigation) can influence pesticide drift. The applicator must evaluate all factors and make appropriate adjustments when applying this product.

### Droplet Size

Apply only as a medium or coarser spray (ASAE standard 572) or a volume mean diameter of 300 microns or greater for spinning atomizer nozzles.

### Wind Speed

Do not apply at wind speeds greater than 15 mph. Only apply this product if the wind direction favors on-target deposition (approximately 3 to 10 mph), and there are no sensitive areas within 250 feet downwind.

### Temperature Inversions

If applying at wind speeds less than 3 mph, the applicator must determine if a) conditions of temperature inversion exist, or b) stable atmospheric conditions exist at or below nozzle height. Do not make applications into areas of temperature inversions or stable atmospheric conditions.

### Other State and Local Requirements

Applicators must follow all state and local pesticide drift requirements regarding application of copper compounds. Where states have more stringent regulations, they must be observed.

### Equipment

All aerial and ground application equipment must be properly maintained and calibrated using appropriate carriers or surrogates.

#### *Additional requirements for aerial applications:*

- The boom length must not exceed 75% of the wingspan or 90% of the rotor blade diameter.
- Release spray at the lowest height consistent with efficacy and flight safety. Do not release spray at a height greater than 10 feet above the crop canopy unless a greater height is required for aircraft safety.
- When applications are made with a crosswind, the swath must be displaced downwind. The applicator must compensate for this displacement at the up and downwind edge of the application area by adjusting the path of the aircraft upwind.

#### *Additional requirements for ground boom application:*

- Do not apply with a nozzle height greater than 4 feet above the crop canopy.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the State or Tribal agency responsible for pesticide regulation.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as soil or water, is:

- Coveralls
- Chemical-resistant gloves made of any waterproof material,
- Shoes plus socks
- Protective eyewear

### NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not allow adults, children or pets to enter until sprays have settled.

## STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

**PESTICIDE STORAGE:** Store in a cool, dry place. Keep container closed when not in use. Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Do not store or transport near feed or food.

**PESTICIDE DISPOSAL:** Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Store in a cool, dry place in the original container. Do not store in a manner where cross-contamination with other pesticides, fertilizers, food or feed could occur.

### CONTAINER DISPOSAL:

**NONREFILLABLE CONTAINER (EQUAL TO OR LESS THAN 5 GALLONS):** Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by State and local authorities by burning. If burned, stay out of smoke.

**NONREFILLABLE CONTAINER (GREATER THAN 5 GALLONS):** Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

**REFILLABLE CONTAINER:** Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

Helena COPPER-Z 4/4 can be used to control algae in impounded waters, lakes, ponds and reservoirs, for algae and potamogeton pond weed control waters destined for use as drinking water or irrigation conveyance systems.

## DIRECTIONS FOR USE

This liquid copper sulfate product is easy and ready to use to control algae in slow-moving or quiescent bodies of water including: golf course, ornamental, fish, irrigation and fire ponds; fresh water lakes and fish hatcheries; water destined for drinking water and non-potable water reservoirs and associated waters (river, streams, bays and coves); and crop and noncrop irrigation conveyance systems (canals, laterals and ditches). Waters treated with COPPER-Z 4/4 may be used for swimming, fishing, drinking (after further treatment), livestock watering or irrigating turf, ornamental plants or crops.

COPPER-Z 4/4 effectively controls many species of both filamentous (mat forming green algae) and planktonic (single cell blue-green) algae. The rate of copper sulfate and control are affected by algae species, water hardness, water temperature, amount of algae present, as well as whether water is clear, turbid, flowing, or static. Preferably water should be clear and above 60 DEGREES F, with treatment made in the late morning on a sunny day. Static water usually requires less copper sulfate than flowing water. The harder the water, the higher the required rate of copper sulfate. When mats of filamentous algae are floating, the surface of these mats should be sprayed. Algae will absorb the copper sulfate within hours after treatment, and death should be evident within 3 to 5 days. If there is some doubt about the concentration to apply, begin with a lower rate and increase the rate until the algae are killed. (A few algae species are resistant to copper sulfate treatment and may not be killed). Repeat treatments may be needed to keep algae under control to the desired levels.

Treatment of algae can result in oxygen loss from the water caused by the decay of dead algae. This loss can cause fish suffocation. To minimize this hazard, treat 1/3 to 1/2 of the water area in a single operation and wait 14 days between treatments. Begin treatments along the shore and proceed outwards in bands to allow fish to move into untreated water. Trout and other species of fish may be killed at application rates recommended on this label, especially in soft and acid waters.

1. **For Algae Control in Reservoirs, Lakes, Ponds, Impounded Waters: When to apply:** Early treatment is essential for most satisfactory algae control at the lowest rate levels. Early growth is usually confined to shallower shore areas. Begin treatment when not over 5 to 10% of the water surface area is covered with algae growths which is usually nearest the shoreline. Delaying treatment until heavy algae growths are present usually requires a higher rate and may result in fish distress or death since rapid decomposition of heavy growths greatly reduces the oxygen content of the water. Several repeat treatments are necessary to control algae each season.

**How to apply COPPER-Z 4/4:** Dilute the recommended amount of this product in sufficient water to thoroughly and uniformly spray the water surface including any floating algae mats.

**Rates to Control Algae:** First, accurately determine the surface acres of water to be treated at one time and multiply this by the average depth in feet of this water area to determine the acre feet of water to be treated. (One acre foot = one surface acre [43,560 sq. ft.] x one foot depth.)

Each acre foot of water contains 326,000 gallons, or 2,720,000 pounds of water. Since recommended concentrations are normally given in parts per million (ppm), it will first be necessary to convert the value in parts per million to a decimal equivalent. For example, 2 ppm is the same as 0.000002 when used in this calculation. Therefore, to calculate the amount of Copper Sulfate Pentahydrate to treat 1 acre-foot of water with 2 ppm Copper Sulfate, the calculation would be as follows:

$$0.000002 \times 2,720,000 = 5.44 \text{ lbs. Copper Sulfate Pentahydrate.}$$

To obtain the correct amount of Helena COPPER-Z 4/4 divide 5.44 lbs. by 1.53 lbs. which equals 3.5 gallons of COPPER-Z 4/4. The rates of COPPER-Z 4/4 per acre foot of water to control specific algae species are given later in the label.

Secondly, if the problem algae genera is known, use the table below and its equivalence to determine the approximate rate of this product needed to control that genera. If the genera of either filamentous or planktonic algae is not known, apply 6.2-9.3 quarts of this product per acre foot of water, using the lower rate in soft water and the higher rate in hard water. For control of bottom-attached algae Chara and Nitella use 9.3-12.8 quarts per acre foot of water to be treated. If control is not achieved or in very adverse waters, a higher rate may be needed. **DO NOT EXCEED LABELED RATES.**

#### COPPER SULFATE REQUIRED FOR TREATMENT OF DIFFERENT GENERA OF ALGAE

The genera of algae listed below are commonly found in waters of the United States. Use the lower recommended rate in soft waters (less than 50 ppm methyl orange alkalinity) and the higher concentration in hard water (above 50 ppm alkalinity). Always consult State Fish and Game Agency before applying this product in municipal water.

#### PPM EQUIVALENT OF COPPER-Z 4/4 PER ACRE FOOT OF WATER

ORGANISM	1.4-3.5 gals. of COPPER-Z 4/4 0.2-0.5 ppm elemental copper		3.5-7.0 gals. of COPPER-Z 4/4 0.5-1.0 ppm elemental copper	
	<i>Cyanophyceae</i> (Blue-green)	Anabaena Anacystis Aphanizomenon Gloeotrichia Gomphosphaeria Polycystis Rivularia	Cylindrospermum Oscillatoris Plectonema	Nostoc Phormidium
<i>Chlorophyceae</i> (Green)	Closterium Hydrodictyon Spirogyra Ulothrix	Botryococcus Cladophora Coelastrum Draparnaldia Enteromorpha Gloeocystis Microspora Tribonema Zygnema	Chlorella Crucigenia Desmidium Golenkinia Oocystis Palmella Pithophora Staurastrum Tetraedron	Ankistrodesmus Chara Nitella Scenedesmus
<i>Diatomaceae</i> (Diatoms)	Asterionella Fragilaria Melosira Navicula	Gomphonema Nitzschia Stephanodiscus Synedra Tabellaria	Achnanthes Cymbella Neidium	
<i>Protozoa</i> (Flagellates)	Dinobryon Synura	Ceratium Cryptomonas	Chlamydomonas Hawmatococcus	Eudorina Pandorina

	Uroglena Volvox	Euglena Glenodinium Mallomonas	Peridinium	
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2. Algae Control in Rice Fields: Apply 6.3 to 7.0 gallons COPPER-Z 4/4 liquid per acre foot of water to the water surface as a surface spray. Application should be made when the algae has formed on the soil surface but prior to rising of the water surface.
3. Tadpole Shrimp Control in Rice Fields: Apply 3.1 to 6.3 gallons of COPPER-Z 4/4 liquid per acre to the flooded field at any time the pest appears between planting time and until the seedlings are rooted and have emerged through the water surface. The lower rate should be used when the water depth and flow rate are minimal and higher rate should be used when the water depth and flow are at a maximum.

#### RESTRICTIONS AND LIMITATIONS

Fish Ponds and Fish Hatcheries (Aquaculture): Maximum treatment level is 0.4 ppm of metallic copper (2.8 gallons of COPPER-Z 4/4 per acre foot of water).

#### DRIP SYSTEM APPLICATION FOR USE IN CANALS, DITCHES, LATERALS AND OTHER IRRIGATION CONVEYANCE SYSTEMS

- COPPER-Z 4/4 should be applied as soon as algae or Hydrilla begins to interfere noticeably with normal delivery of water (clogging of lateral headgates, suction screens, weed screens and siphon tubes). Delaying treatment could perpetuate the problem causing massing and compacting of plants. Heavy infestations and low flow conditions increasing water flow rate during application may be necessary.
- Prior to treatment it is important to accurately determine water flow rates. In the absence of weirs, orifices, or similar devices which give accurate water flow measurements, volume of flow may be estimated by the following formula:

Average Width (feet) x Average Depth (feet) x Velocity\* (feet/second) x 0.9 = Cubic Feet per Second (C.F.S.)

\*Velocity is the time it takes a floating object to travel a given distance. Dividing the distance traveled (feet) by the time (seconds) will yield velocity (feet/second). This measurement should be repeated at least three times at the intended application site and then averaged.

- After accurately determining the water flow rate in C.F.S. or gallons/minute, find the corresponding COPPER-Z 4/4 drip rate on the chart below.

WATER FLOW RATE		COPPER-Z 4/4 DRIP RATE*		
C.F.S.	Gallon/Minute	Quarts/Hour	Milliliters/Minute	Fl. Oz./Minute
1	450	2.3	36.5	1.25
2	900	4.6	64	2.5
3	1350	6.9	109.5	3.75
4	1800	9.2	146	5.0
5	2250	11.5	182.5	6.25

- Calculate the amount of COPPER-Z 4/4 needed to maintain the drip rate for a period of 3 hours by multiplying Qts./Hr. x 3; ml/Min. x 180; or Fl. Oz./Min. x 180. Dosage will maintain 1.0 ppm metallic copper concentration in the treated water for the 3-hour period. Introduction of the chemical should be made in the channel at weirs or other turbulence-creating structures to promote the dispersion of chemical.
- Pour the required amount of COPPER-Z 4/4 into a drum or tank equipped with a brass needle valve and constructed to maintain a constant drip rate. Use a stop watch and appropriate measuring container to set the desired drip rate. Readjust accordingly if flow rate changes during the 3-hour treatment period.
- Distance of control obtained down the waterway will vary depending upon density of vegetation growth. Treatment period may have to be extended up to 6 hours in areas where control may be difficult due to high flows or significant growth. Periodic maintenance treatments may be required to maintain seasonal control.
- Wait 14 days before retreatment.

#### CONDITIONS OF SALE-LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES

Read the Conditions of Sale-Warranty and Limitations of Liability and Remedies before using this product. If the terms are not acceptable, return the product, unopened, and the full purchase price will be refunded.

The directions on this label are believed to be reliable and should be followed carefully. Insufficient control of pests and/or injury to the crop to which the product is applied may result from the occurrence of extraordinary or unusual weather conditions or the failure to follow the label directions or good application practices, all of which are beyond the control of Helena Chemical Company (the "Company") or seller. In addition, failure to follow label directions may cause injury to crops, animals, man or the environment. The Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use subject to the factors noted above which are beyond

the control of the Company. The Company makes no other warranties or representations of any kind, express or implied, concerning the product, including no implied warranty of merchantability or fitness for any particular purpose, and no such warranty shall be implied by law.

To the extent consistent with applicable law, the exclusive remedy against the Company for any cause of action relating to the handling or use of this product shall be limited to, at Helena Chemical Company's election, one of the following:

1. Refund of the purchase price paid by buyer or user for product bought, or
2. Replacement of the product used

To the extent allowed by law, the Company shall not be liable and any and all claims against the Company are waived for special, indirect, incidental, or consequential damages or expense of any nature, including, but not limited to, loss of profits or income. The Company and the seller offer this product and the buyer and user accept it, subject to the foregoing conditions of sale and limitation of warranty, liability and remedies.

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