Correct copper deficiencies with COPPOX®

Melpat Technical Bulletin

Copper deficiency, the problem

The need for adequate copper supply to crops has been clearly demonstrated in many trials over many years, particularly in sandy and sandy loam soils.

Symptoms

Under conditions of severe copper deficiency, cereal plants may have leaves that die back from the tip and twist into curls. Copper deficiency rarely produces those severe plan symptoms in the field however, more commonly expressing itself in the form of chlorosis, weak stems and poor root growth. Shrunken heads in cereals or heads with gaps in them (due to poor seed set from sterile pollen) and delayed maturity are more commonly encountered.

Copper deficient pasture legumes are pale, have an erect growth habit and leaves that tend to remain cupped (as if the plant was suffering from moisture stress).

Occurrence

It is possible that copper deficiency may become more prevalent in the future, because:

- Copper applications made 10 to 30 years ago would be running out, if not already exhausted;
- The use of nitrogenous fertilisers is increasing and this can increase the severity of copper deficiency;
- Copper deficiency is influenced by seasonal conditions and farming practices. For example, lupins in a lupin/wheat rotation make copper deficiency worse in succeeding wheat crops; and,
- Root pruning herbicides make uptake more difficult.

Diagnosis

Leaf analysis to detect copper deficiency in plants is an extremely important management tool because copper deficiency can produce devastating yield losses, often with little evidence of the characteristic symptoms.

COPPOX … ultra fine particles, more 'active sites' for better results

COPPOX particle size efficacy

Particle size is key to the performance of this type of product. A high number of particles per unit weight results in an increase in the area of the chemically active surface (also referred to as 'active sites'). COPPOX particle size is very small:

- 30% of particles are below 0.5 micron
- 50% of particles are below 1.58 micron
- 85% of particles are below 3.0 micron

More active sites

The immobility of copper in the soil means this nutrient is mainly taken up by plant roots growing out, exploring the soil and contacting the copper.

COPPOX's ultra fine particle formulation means more 'active sites' and hence better uptake by your crop!

COPPOX … the solution

Although copper deficiency is best corrected with copper application to the soil, foliar sprays have also been shown to help overcome the problem in the short term.

Versatile

COPPOX is an ***ultra fine*** particle formulation of Copper Oxychloride, containing 50% copper and formulated especially for boom-spray application. COPPOX provides the versatile solution for even application to both deficient soils and plant foliage.

Application of COPPOX through a well-calibrated boom-spray ensures application uniformity that cannot be matched by solid fertiliser blends.

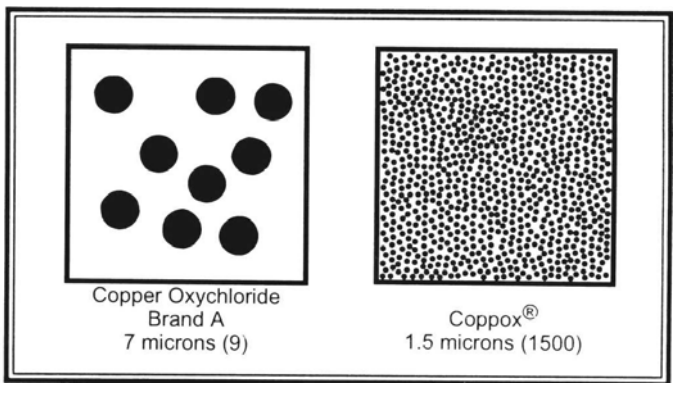
COPPOX's unrivalled ***ultra fine*** particle formulation ensures:

- More complete dispersal within the spray tank;
- Better coverage of soil and foliage;
- No nozzle blockages when mixing guidelines are observed.

There are more 'active sites' with fine particles. The smaller the particle, the greater the number of 'active sites' to maximize copper uptake by your crop.

Other COPPOX benefits

- COPPOX applied to the soil is available in the year of application when applied prior to seeding and worked into the soil.
- COPPOX is not broken down by sunlight, is insoluble and stable, and therefore not lost by leaching. Excess copper is therefore not wasted. Instead, it is available to the plant in subsequent years.
- COPPOX has fungicidal activity and is registered as a preventative of disease in a wide range of crops.
- In paddocks where there are different soil types and therefore variable copper requirements, application rates can be varied as required.
- COPPOX is non corrosive when used as directed.
- Less chance of phytotoxicity. Free copper ions (present as copper chloride) are undesirable because of their phytotoxic effects when sprayed onto some green plant foliage. (Copper chloride is an intermediate in the production process of copper oxychloride.) Many brands have copper chloride levels of between 1% and 2%. The level in COPPOX is between: 0.05% and 0.09%.



Correct recommendations for best results

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Spray application

COPPOX is both root and leaf absorbed. Applications should be based on the principle of "small amounts often" rather than "a lot at once".

COPPOX rates

COPPOX rates vary from 300 g/ha to 1kg/ha. Rate variability is due to soil type and severity of the deficiency.

Options

- Single application: Pre-seeding rate of 500 g/ha to 1kg/ha.
- Split application: Pre-seeding 500 g/ha + tillering 300 to 400g/ha.

Timing

COPPOX can be applied at different stages.

Pre-seeding – boom-spray application (1kg/ha)

COPPOX should be sprayed onto the soil prior to seeding and incorporated into the soil during seeding. Copper is very insoluble and therefore virtually immobile in the soil. For this reason, it is not leached and cultivation is necessary to position the copper into the root zone. The performance of any copper application will improve with increased soil disturbance. For optimum uptake, COPPOX should be evenly distributed throughout the top 5cm of soil.

Tillering – boom-spray application 300 to 400 g/ha (stem/leaf absorption)

COPPOX can also be applied as a foliar spray. Leaf uptake is quicker than root uptake. Application should be made at maximum leaf canopy – i.e. tillering, in order to maximize absorption and minimise wastage. The 6 leaf stage is ideal. Copper falling on the soil surface will be utilised in subsequent seasons. If deficiency symptoms appear earlier than the recommended 6 leaf stage, spray immediately.

Do Not apply COPPOX to:

- Cereal crops once the flag leaf has emerged.
- Copper sensitive varieties such as Stretton.

Spray preparation and clean-up

Pre-mixing

With spray vats with good agitation, COPPOX can be poured directly into the tank.

With poor agitation it is advisable to pre-mix 10 to 15kg of COPPOX in a 25 to 40 litre container first. The solution can then be poured into the spray vat through the upper gauze filter, or, sucked in using a probe.

Granny Pot or similar mixing apparatus are ideal.

Agitation

COPPOX is insoluble and hence requires thorough and continuous agitation whilst in the spray tank. The spray solution should not be left to stand without agitation e.g. at lunch time or overnight.

Filtration

80 mesh filters should be used rather than 120. Do not use Cuno filters.

Water volumes

Use a minimum rate of 50 L/ha.

COPPOX compatibilities

COPPOX is an inert powder and therefore is compatible with a wide range of insecticides and herbicides.

Test the tank-mix

Because formulations from other manufacturers can change from year to year, it is advisable to test compatibilities prior to full-scale spray applications.

Clean-up

Following application, flush out your system with clean water.

Do not allow the solution to dry in the spray lines as this will cause blockages. Drying occurs rapidly.

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