

# Trial instructions for ZM-Grow™

These trial instructions are intended for conducting field trials with ZM-Grow™.

The purpose of these instructions is to help with trial preparations, to carry out the trial, to document the trial, and to report the trial results, so that you will get as accurate and useful trial result data as possible.

If you have any questions when organizing your trial, please, feel free to consult Tracegrow's professionals for more information.

## TRIAL GOALS

Decide the goal of your trial. You may want to find out:

- what is ZM-Grow™'s effect on your crop yield
- how much micronutrients are absorbed by the plant
- or both

## TRIAL PREPARATIONS

1. Assign two or three plots for the trials:
  1. An area which you'll spray with 2-3 litres of ZM-Grow™. If you want to compare the 2 and 3 liter applications, assign separate trial plots for both.
  2. An untreated area without any micronutrient fertilization.
  3. Optionally, an area which you'll treat with a product that you'd like to compare ZM-Grow™ with. In this case use the application that the product manufacturer recommends.
2. The following conditions must match for all the plots, including the untreated plot, so that comparing the results between the plots will be as reliable as possible:
  1. Identical soil
  2. Equal irrigation water amount and irrigation frequency
  3. Environmental conditions (sunlight, temperature)
  4. Equal application of other agrichemicals such as herbicides and fungicides.

## DOCUMENTING THE TRIAL

1. Document the following details according to your trial goals. All details are not necessary, but the more data you collect, the more reliable conclusions you can form:
  1. The names and amounts of applied fertilisers and agrichemicals (this one is necessary)
  2. Weather conditions such as rain and temperature
  3. The soil type
  4. The soil conditions (Zn and Mn contents, pH, salinity, etc.)
  5. Any abnormalities or surprising effects during the experiment
2. Take photos of different growth phases of the fields to see the difference(s)

## CARRYING OUT THE TRIAL

1. The following applies to the trial area for ZM-Grow™:
  1. Mix 2-3 litres of ZM-Grow™ with water before spraying. The water needs to stay on the leaf long enough, so that the leaves absorb the micronutrient efficiently: The water amount depends on the water conditions. Water amount recommendations for spraying are the following:
    1. Minimum of 200 l of water in moderate weather conditions, such as in Scandinavia, Great Britain, Northern Germany, etc.
    2. Minimum of 400 l of water in hot and dry weather conditions, such as in Italy, Spain, Greece, etc.
  2. Spray at a point of time when water evaporation rate is low. Early morning or night are the best times for spraying.
2. If you wish to spray other agrichemicals simultaneously in the same water batch with ZM-Grow™, check the ZM-Grow™ mixing table, and note if the agrichemical is allowed to be mixed with the ZM-Grow™ or not:
  1. Do not mix ZM-Grow and agrichemicals as such in their raw form. Add them only one in the same water batch.
  2. If the agrichemical is approved for mixing in the table, mix the agrichemical and ZM-Grow™ to water.
  3. If the agrichemical is not listed on the mixing table, make a small-scale mixing experiment: calculate the amounts of ZM-Grow™ and agrichemical for 2 litres of water, and mix them with water, and observe if any precipitation occurs, since this precipitation could block the spraying equipment.
  4. If no solids form in the small-scale experiment, you can then mix the agrichemical and ZM-Grow™ to water
3. When ZM-Grow™ and agrichemicals are mixed during spraying, they may react with each other, and their efficiency might become hindered. This is why very complex mixtures are not recommended.

## REPORTING THE RESULTS OF THE TRIAL

1. The following applies to a yield trial:
  1. Determine the crops per all trial areas by calculating the crop in kg/ha
  2. Compare the yield increase between the untreated, ZM-Grow™ -treated and the competing product treated fields in both kg/ha and in %.
2. If you want to know the micronutrient contents of the leaves:
  1. Wash the leaves with distilled water several times to remove all fertiliser residues from the leaf surface
  2. Dry the leaf mass in an oven to remove water content
  3. Weigh the dried leaves
  4. Dissolve the dried leaf mass to proper acid(s), dilute the formed liquid, and analyze the leaves
  5. Report the metal contents of the leaves in mg/kg dry weight

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# Tank mix table

			+	Avaunt 150 EC		
			+	Decis Mega EW 50		
			+	Cerone		
			+	Medax Max		
			+	Sonis		
			+	Stabilan 750 SL		
	+	Hi-Phos				
	+	Thio-S				
	+	Thio-S	+	Hi-Phos		
			+	Ariane S		
			+	Duplosan Super		
			+	Buctril		
			+	Nufarm MCPA		
			+	Nufarm MCPA	+	Classic Premium SX
			+	Classic Premium SX		
	+	Hi-Phos		Classic Premium SX		
			+	Twist	+	Classic Premium SX
			+	Starane 333 HL	+	Classic Premium SX
			+	Starane XL		
	+	Thio-S		Starane XL		
	+	Hi-Phos		Starane XL		
			+	Matrigran 72 SG		
			+	Lentagran WP		
			+	Ascra Xpro		
			+	Prosaro EC 250		
			+	Comet Pro		
			+	Don-Q		
			+	Talius		

No precipitate.  
 Small amount of soft precipitate.  
 Precipitate generated. Mix not recommended.

Tank mixing tests conducted using the highest allowed dosage, ZM-Grow™ 3.0 l/ha and water 200 l/ha. The figures in the table are approximate, as the quality of spraying water (temperature, hardness, pH value, humus content) affects the outcome. We recommend testing the compound in a smaller container before spraying. Observe the general instructions on filling order for tank mixing, as well as the operating instructions of the filler.



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