

## Mono-Ammonium Phosphate 12-61-0

Multi-MAP is a fully water-soluble mono-ammonium phosphate (12-61-0) fertilizer, a highly efficient source of phosphorus and nitrogen for plants. Multi-MAP is recommended for use at the beginning of the growing season, because phosphorus availability is crucial for the establishment of root system at this stage. Multi-MAP can serve as a high quality source of phosphorus also during other stages of the growth cycle.

Its high purity and water-solubility make Multi-MAP an ideal fertilizer for fertigation and for foliar application. Multi-MAP is suitable for preparation of fertilizer blends and production of liquid fertilizers

### The advantages of Multi-MAP

- Fully water-soluble
- Consists of 100% plant nutrients
- Highly-concentrated source of phosphorus for plants (61% P<sub>2</sub>O<sub>5</sub> / 27% P)
- Free of chloride, sodium and other detrimental elements for plants
- Moderately low pH (safer and less corrosive compared to urea phosphate)
- Suitable for the fertigation, foliar application and production of fertilizer blends and nutrient solutions

**Double benefit:** Not only that Multi-MAP is an efficient source of phosphorus, it also facilitates plant uptake of the phosphorus naturally present in the soil. This is due to the ammonium (NH<sub>4</sub><sup>+</sup>) in Multi-MAP, which lowers the pH in the root zone and thus enhances phosphorus availability.

### Product analysis

Nutrient	Content (%)
P <sub>2</sub> O <sub>5</sub>	61%
P	27%
N total	12%
N-NH <sub>4</sub>	12%



### Water solubility

The solubility of Multi-MAP is considerably enhanced by increase in water temperature, as shown in the following table.

Water temperature (°C)	0	10	20	30	40
Solubility (g/100g water)	22.7	29.5	37.4	46.4	56.7

### pH and EC

Multi-MAP has a moderately low pH that remains almost constant at different concentrations.

Concentration (%)	0.1	0.2	0.3	1.0	5.0
PH	4.7	4.6	4.6	4.4	4.2

The electrical conductivity (EC) increases substantially when high concentrations of Multi-MAP are used.

Concentration (%)	0.1	0.2	0.3	1.0	5.0
EC (mS/cm)	0.86	1.66	2.5	7.4	27.8

# Application Recommendations

## Nutrigation

Because of unique product characteristics, Multi-MAP can be applied through any irrigation system and on any growing medium. Unlike phosphoric acid, Multi-MAP is moderately acidic (see table on the 1<sup>st</sup> page). Therefore, it is not corrosive to fertilizer pumps or to irrigation equipment.

## Compatibility

Multi-MAP is compatible with most water-soluble fertilizers, except for fertilizers containing calcium ( $\text{Ca}^{++}$ ) or magnesium ( $\text{Mg}^{++}$ ). To apply Multi-MAP in combination with calcium or magnesium fertilizers, use two fertilizer tanks. If only a single fertilizer tank is available, apply those fertilizers at different times.

## Quantitative Nutrigation

Each kilogram of Multi-MAP in the tank provides 610 grams of phosphorus ( $\text{P}_2\text{O}_5$ ) and 120 grams of ammonium-nitrogen ( $\text{N-NH}_4$ ).

Example: from initial establishment to flowering, open-field grown tomatoes require phosphorus at a rate of 1.5 kg  $\text{P}_2\text{O}_5$  per hectare per day. To provide this, apply Multi-MAP at a rate of 2.5 kg per hectare per day. This will provide also 0.3 kg nitrogen per hectare per day. To complete nitrogen and potassium requirements, apply ammonium nitrate and Multi-K (potassium nitrate).

## Proportional Nutrigation

The phosphorus concentration in the irrigation water depends on the quantity of Multi-MAP in the tank mix, and on the injection ratio. Use the following table to calculate the quantity of Multi-MAP and the injection ratio needed to reach a given concentration in the irrigation water.

Multi-MAP g/1000 liter water	Nutrient concentration (ppm, g/1000 litre)		
	N	$\text{P}_2\text{O}_5$	P
100	12	61	27
130	15	79	34
149	17	90	40
185	22	112	50
370	44	225	100

## Foliar Feeding

Foliar spray with Multi-MAP is effective in supplying phosphorus whenever quick response to deficient plants is required. It should be considered as a supplemental method to soil applied phosphorous. The concentration of Multi-MAP solutions can be increased according to leaf age.

On young leaves, spray concentration of 0.5% Multi-MAP is recommended in most crops. On mature leaves and more tolerant crops higher concentration (1.0% or more) may be applied.

Multi-MAP is compatible with most commonly used pesticides and fertilizers. However, it should not be mixed with calcium or magnesium fertilizers. It is advisable to confirm compatibility of your intended spray-mix by preparing a sample of the spray materials at their recommended concentrations in order to rule out the possibility of a detrimental cross reaction. This mixture should be sprayed onto small area prior to commercial treatment, in order to assess whether an adverse effect occurs.