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# Haifa VitaPhos-K™

Precipitation-proof phosphate for soilless Nutrigation™



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Haifa Chemicals Ltd.



Haifa Chemicals Ltd.  
 Pioneering the Future

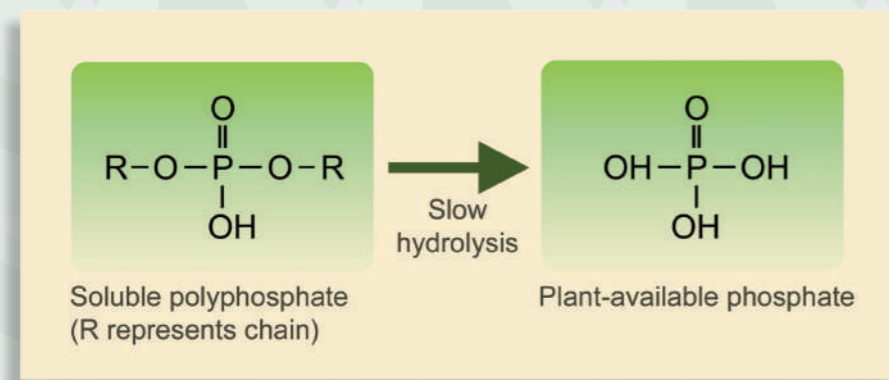


Plants absorb phosphorus primarily in the form of monovalent phosphate ion  $-H_2PO_4^-$ , the form that most phosphoric fertilizers provide. Yet, the phosphate ion is very likely to form insoluble precipitates with cations from the soil and the water, thus becoming unavailable for plant uptake. Haifa VitaPhos-K™ is an innovative fertilizer designed to keep the phosphorus in the solution. With this special feature, Haifa VitaPhos-K™ is an ideal source of phosphorus for crops in soilless media.

### How Haifa VitaPhos-K™ works

Haifa VitaPhos-K™ contains phosphorus in the form of soluble polyphosphates. Unlike the phosphate ion, polyphosphates remain in the solution and do not precipitate.

In the root zone, the polyphosphate chain undergoes slow hydrolysis, providing plant-available phosphate over time. The rate of hydrolysis depends on the length and the spatial structure of the chain. The composition of Haifa VitaPhos-K™ ensures that the hydrolysis occurs at the right time and the right location – by the surface of the root. Haifa VitaPhos-K™ prevents both fast hydrolysis resulting in phosphate precipitation and too-slow hydrolysis creating deficiencies. The pH of the solution does not affect the rate of hydrolysis and phosphate availability.



### Product analysis

Nutrient	Content
P <sub>2</sub> O <sub>5</sub>	31%
P	13.6%
K <sub>2</sub> O	49%
N-NO <sub>3</sub>	4%

Haifa VitaPhos-K™ is available in 25kg bags



## Haifa VitaPhos-K™ for soilless Nutrigation™

Precipitation of phosphates removes not only phosphorus from the root zone, but also other essential elements – calcium, magnesium and micronutrients. In soilless systems the problem is even more severe, as the concentration of phosphorus in the nutrient solution is considerably higher than its concentration in the soil. Haifa VitaPhos-K™ prevents removal of essential nutrients from the solution. Moreover, the polyphosphate behaves like a chelate by absorbing cations (potassium, magnesium, calcium and micronutrients) to its hydroxyl (-OH) group. The slow hydrolysis releases these cations for plant uptake.

### Haifa VitaPhos-K™ cleans water passages

Besides being a source of plant nutrition, Haifa VitaPhos-K™ helps keeping water passages clean of precipitates and free for water flow. Haifa VitaPhos-K™ dismantles precipitates by bonding cations, which are then released again for plant uptake.

### Haifa VitaPhos-K™ is highly recommended in the following cases:

- In the winter, when irrigation quantities are reduced and more concentrated nutrient solutions are used
- Where the irrigation water contains high concentrations of bicarbonates
- When fast, intensive growth is expected

### Application recommendations

Dissolve Haifa VitaPhos-K™ in Tank B, after adding the acids. Micronutrients should be added to Tank A.

Use the following tables to determine the quantity of Haifa VitaPhos-K™ you need to replace your conventional source of phosphorus.

If you use solid mono-potassium phosphate									
kg P in the tank		0.5	1.0	1.5	2.0	2.5	3.0	3.5	
Use	Haifa VitaPhos-K™	3.7	7.3	11.0	14.7	18.3	22.0	25.6	kg
	Nitric acid 38%	1.3	2.6	4.0	5.3	6.6	8.0	9.3	Liter
Instead of	MKP	2.2	4.4	6.6	8.7	10.9	13.1	15.3	kg
	Potassium nitrate	2.2	4.4	6.6	8.8	11.0	13.2	15.3	kg

If you use solid fertilizers with phosphoric acid									
kg P in the tank		0.5	1.0	1.5	2.0	2.5	3.0	3.5	
Use	Haifa VitaPhos-K™	3.7	7.3	11.0	14.7	18.3	22.0	25.6	kg
	Nitric acid 38%	3.5	7.0	10.5	14.0	17.5	21.0	24.5	Liter
Instead of	Phosphoric acid 59%	1.9	3.8	5.7	7.6	9.4	11.3	13.2	Liter
	Potassium nitrate	3.8	7.6	11.4	15.2	19.0	22.8	26.6	kg