Solinure® FX

Solinure® GT

Precision Nutrition with Fertigation Fertilizers

www.icl-sf.com

ICL Specialty Fertilizers

ICL Fertigation Fertilizers, precise nutrition to enhance crop production

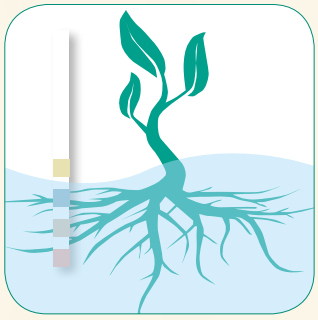
Fertigation is a technique by which soluble fertilizers are mixed with the irrigation water to enhance crop productivity. It is a highly effective and flexible tool for controlling placement, timing, and nutrient application methods. This makes precise nutrient application possible according to the soil fertility status and growth stage of any crop.

PeKacid Technology

PeKacid a unique, patented, mono-crystal, water-soluble phosphoric acid in dry form. It is nitrogen free and contains no sodium or chlorine.

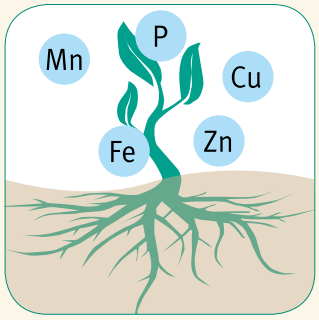
It combines the advantages and efficiency of phosphoric acid with the ease and safety of a solid crystalline fertilizer. The use of PeKacid (An "acid in the bag" product) replaces the conventional application of technical- and agricultural-grade phosphoric acid, resulting in an easier, safer and more effective fertilization process. Due to its acidic nature, PeKacid has an anti-clogging action and enhances nutrients' uptake. ICL Specialty Fertilizers uses PeKacid technology in many of their water-soluble fertigation formulations.

PeKacid effect



Low pH

Anti clogging action



Enhances nutrient uptake

The benefits of PeKacid technology

1	Reduces pH of hard water when applied directly into the water
2	Prevents clogging in the irrigation / fertigation systems, in turn allowing uniform water and fertilizer distribution across the field
3	Cleans clogged drippers by dissolving precipitates formed during irrigation / fertigation
4	The acidification effect decreases P-fixation in the rhizosphere and promotes trace (elements) uptake in alkaline soils (pH >7)
5	Simplifies handling thanks to the unique dry form of phosphoric acid

Value for money

Solinure FX is an innovative line of fertilizers designed specifically for open-field fertigation. This product contains chloride and urea.

Solinure FX does not have any trace elements in its formulation, which allows users to customize their fertilization plans by adding individual micro-nutrient fertilizers (Micromax or Agrolution Liquid). Solinure FX contributes to the reduction of the pH of the solution due to its acidifying effect.

Solinure FX contains the unique PeKacid technology in his formulations.

Solinure FX products are recognized for their great value for money.

Benefits of Solinure FX

1	A complete portfolio to fertigate open-field crops
2	Solinure FX reduces bicarbonates and has an acidifying effect. Nutrient availability to the plant will improve due to the optimum pH level
3	High purity

The Clean Dripper Effect

Precipitation caused mainly by hard water irrigation can block the dripper

Regular application of Solinure FX neutralizes precipitation

Clean dripper after using Solinure FX

"After fruit-setting, I used Solinure FX 10-10-40 on my melons under tunnel in 2015 to compare with my usual NPK soluble fertilizers. Very easy to dissolve, Solinure FX enabled me to make my yield and caliber better this year, while increasing the Brix rate by 2 points!

Trying Solinure is adopting it. ."

Mr. Guillaume Sarl
St. Martin de Crau, France
Grower of melons (5 ha), lettuces (5 ha) and strawberries.

Solinure® GT

Effective and convenient!

Solinure GT products are available in different formulas and are ideal for greenhouse and tunnel applications.

Fertigation

They are made from pure, raw materials that provide complete nutrition for the crop. The Solinure GT formulations are low in urea and meet the plant's basic magnesium requirements. All the formulations contain trace elements that are 100% chelated to ensure outstanding plant uptake, even under difficult soil conditions. The Solinure GT products contain no chlorides and also contain minimum levels of urea.

Benefits of Solinure GT

1	Smart designs: a complete range with the right formulations for every crop's need
2	Special formulations: particularly useful for cool and dark winter growing conditions
3	Clean materials: low impurity levels in the ingredients
4	Chloride free
5	Optimal package of trace elements to meet plant's requirements

" Solinure is a product that dissolves properly and has demonstrated a clear response of the trees after its application. I noticed that trees showed greener vegetation and better development. In addition, Solinure is a product with good value that guarantees the best results. I trust in Solinure because it is a professional high quality product, well packaged and palletized."

Jordi Vendrell (left side)
of Frutas Torre Molins
Huesca, Spain
Seed and stone fruit grower

8,25%

Trial case, Solinure FX

Objective: Compare the efficiency of Solinure FX water soluble fertilizer with grower's practice in melon by measuring the yield and fruit size. **Demonstrate that a Chloride containing water-soluble fertilizer performs as good as a low chloride.**

Trial station: CEHM, France

Crop: Melon, Gandalf variety

Growing Method: Fertigation

Base fertilizers: Both treatments received the same level of nutrients.
Active ingredients: 36 N, 24 P_2O_5, 144 K_2O, 39 MgO (Kg/ha)

A. ICL treatment

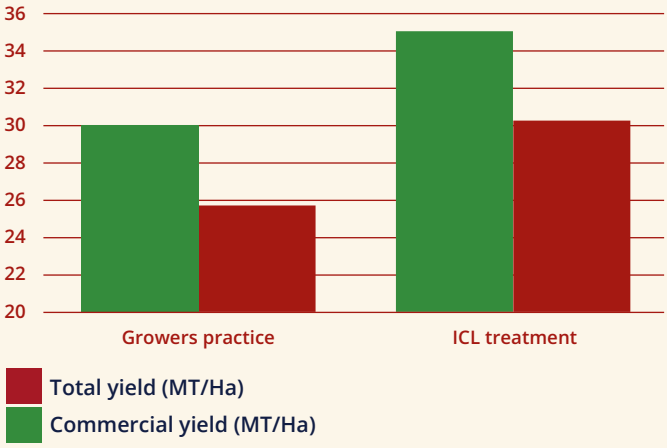
Fertilizers	Type fert.	Week after planting	Active ingredients, Kg/ha				Dosage per week (Kg/ha)
			N	P_2O_5	K_2O	MgO	
Solinure FX 13-40-13	Fertigation	12-14	4.7	14.4	4.7		36
Solinure 10-10-40	Fertigation	17-18	3.5	3.5	14		35
Solinure 10-10-40	Fertigation	19-21	3.2	3.2	12.8		32
		Total*	66.7	83.8	224.5	39	

B. Grower´s practice

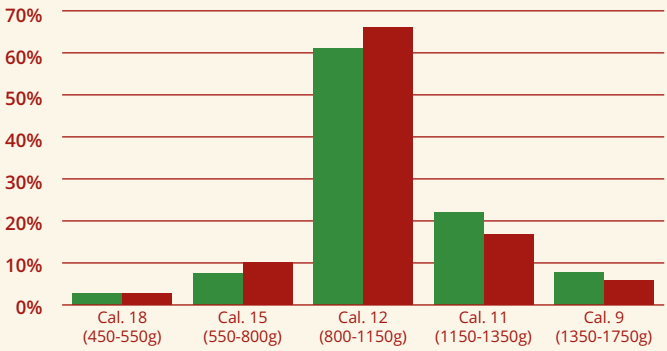
Fertilizers	Type fert.	Week after planting	Active ingredients, Kg/ha				Dosage per week (Kg/ha)
			N	P_2O_5	K_2O	MgO	
MAP	Fertigation	15-16	6	31	0		50
Potassium nitrate	Fertigation	17-18	7	0	23		35
		Total*	62	86	190	39	

** Total nutrient level includes the nutrients provided by base fertilizers*

Total & Commercial Yield (MT/ha)



Fruit size distribution (%)



Economic evaluation	Grower practice	ICL Treatment
Marketable yield (MT/ha)	25,8	30,3
Cat 1, high quality (MT/ha)	12,7	15,2
Cat 2, low quality (MT/ha)	12,6	15,1
Gross income /ha*	30.800 €/ha	33.400 € /ha
Extra costs of ICL treatment (vs. grower practice)		+ 56 € /ha
Extra income / ha (vs grower practice)		2,544 €/ha

** Based on price/day/caliber/category*

Why Solinure FX ?

- Due to its acidifying effect, the phosphorus and metallic trace elements uptake was significantly improved
- Thanks to the balanced formulations matching the plant needs in different growing stages, the plant will get an ideal fertilization.

Conclusion

- The application of Solinure FX increased the gross income per hectare with **8,25%**
- Absolutely no negative effect by using water-soluble fertilizers containing chloride

Breakdown Tables (in %)

Solinure® GT

Product	Formulation	Product Name	Item code	N-total	NO_3-N	NH_4-N	Urea-N	P_2O_5	K_2O	CaO
Solinure GT	10-5-39+2MgO+TE	Solinure GT 1	2919	10	9,0	1,0		5	39	
Solinure GT	7-19-38+2MgO+TE	Solinure GT 2	2922	7	7,0			19	38	
Solinure GT	12-5-35+2MgO+TE	Solinure GT 3	2923	12	8,1	2,1	1,8	5	35	
Solinure GT	14-6-23+2MgO+TE	Solinure GT 4	2918	14	6,1	7,9		6	23	
Solinure GT	20-20-20+TE	Solinure GT 5	2911	20	5,9	3,8	10,3	20	20	
Solinure GT	15-15-15+TE	Solinure GT 6	2916	15	3,4	11,6		15	15	
Solinure GT	18-11-11+2MgO+TE	Solinure GT 7	2910	18	3,3	11,3	3,4	11	11	
Solinure GT	23-10-10+5.6MgO+TE	Solinure GT 8	2921	23	1,0	1,2	20,8	10	10	
Solinure GT	11-35-11+2MgO+TE	Solinure GT 9	2920	11	2,1	8,9		35	11	

Solinure® FX

Product	Formulation	Product Name	Item code	N-total	NO_3-N	NH_4-N	Urea-N	P_2O_5	K_2O	CaO
Solinure FX	10-10-40	Solinure FX	2948	10		1,3	8,7	10	40	
Solinure FX	20-20-20	Solinure FX 10	2951	20		2,1	17,9	20	20	
Solinure FX	18-8-29	Solinure FX 11	2950	18		0,7	17,3	8	29	
Solinure FX	13-40-13	Solinure FX 12	2949	13		6,9	6,1	40	13	
Solinure FX	16-32-16	Solinure FX 13	2944	16		4,3	11,7	32	16	
Solinure FX	24-13-13	Solinure FX 14	2943	24		5,4	18,6	13	13	
Solinure FX	17-8-27+3CaO	Solinure FX 15	2945	17	1,6		15,3	8	27	3,0
Solinure FX	16-8-25+4MgO	Solinure FX 16	2946	16			16,0	8	25	
Solinure FX	15-5-30	Solinure FX 17	2958	15		4,9	10,1	5	30	
Solinure FX	18-9-18	Solinure FX 18	2947	18		8,5	9,5	9	18	

** EDTA chelated* *** DTPA chelated* **** Measured in soft water (comparable to rainwater)*

The key parameters of a fertigation programme

Before designing a fertigation programme, several parameters need to be taken into consideration:

1. Soil: the soil analysis is a very important factor in determining the fertilization plan; knowledge of the nutrient levels in the soil means the grower can adjust the fertilization plan (adding or reducing nutrients). The pH of the soil makes it possible to predict which nutrients will be available in large or small quantities for the plant roots.
2. Water: the water analysis is important as it informs the grower which nutrients the water will supply. The common nutrients in water are: Ca, Mg, and Cl. Knowing the pH levels of the water allows a grower to choose the best formula for his/her conditions. For example, if the pH levels of the water and the bicarbonates are high, the grower will choose fertilizers with an acidifying effect to neutralize the bicarbonates and to reduce the pH of the water. (More information is available in the 'water quality' section).
3. Crop demand: knowing the nutrient demands of various crops during the growing cycle allows the grower to create an accurate fertilization plan that will result in an optimum yield.

	MgO	SO_3	Cl	B	Cu	Fe	Mn	Mo	Zn	HCO_3 reduction mg/g WSF***	EC at 1g/l (mS/cm)	pH at 10 g/l	Max. solubility (kg/100 l)
	2,0	11,2		0,01	0,002*	0,04*	0,01*	0,002	0,002*		1,4	4,4	40
	2,0	4,1		0,01	0,002*	0,04*	0,01*	0,002	0,002*		1,1	4,7	43
	2,0	14,4		0,01	0,002*	0,04*	0,01*	0,002	0,002*		1,4	3,5	41
	2,0	25,0		0,01	0,002*	0,04*	0,01*	0,002	0,002*		1,4	4,6	45
				0,01	0,002*	0,04*	0,01*	0,002	0,002*		0,9	4,4	52
		28,1		0,01	0,002*	0,04*	0,01*	0,002	0,002*		1,5	4,5	50
	2,0	30,2		0,01	0,002*	0,04*	0,01*	0,002	0,002*		1,5	5	43
	5,6	16,7		0,01	0,002*	0,04*	0,01*	0,002	0,002*		0,7	3,1	56
	2,0	14,5		0,01	0,002*	0,04*	0,01*	0,002	0,002*		1,2	4,0	54

	MgO	SO_3	Cl	B	Cu	Fe	Mn	Mo	Zn	HCO_3 reduction mg/g WSF***	EC at 1g/l (mS/cm)	pH at 10 g/l	Max. solubility (kg/100 l)
			29,4							13	1,4	3,1	39
			11,7							14	0,8	3,8	44
		4,6	17,5							10	1,1	2,9	39
			9							11	1,0	4,0	44
			9,5							42	1,0	3,0	50
		9,7	9,3							11	0,9	3,3	52
			18,3							16	1,2	2,7	62
	4,0	8,5	15,7							11	1,1	3,0	40
		19,2	21,5							15	1,4	3,1	30
		21,5	11,7							14	1,4	3,2	40

Overview is subject to formulation changes and misprints.

Principles for a good fertigation plan

- Look at the crop's nutrient requirements during the growth cycle
- Calculate the nutrients acquired from other sources (soil, water, organic fertilizer)
- Take into consideration the amount of water the crop needs each day
- Find the right formula for each growth stage
- Calculate the total amount of water soluble fertilizer that the crop needs for every growth stage (in kg per hectare per day)

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