Soilless greenhouse tomatoes in France

Tomate hors-sol (programme ronde CTIFL)

Crop cycle: 149 Days

Yield goal: 800.00 ton/ha

Plot: France

Plot size: 1 ha

Plantation à F2

Nutrient supply for crop

Stage	Days	Macronutrients (ppm)						Secondary Nutrients (ppm)			Micronutrients (ppm)						
		N_Total	N_NH4	N_NO3	N_NH2	P2O5	K2O	CaO	MgO	SO4	Fe	Mn	Zn	Cu	Mo	B	EC (ds/m)
Plantation à F2	14	231.00	21.00	210.00	0.00	57.59	285.46	232.96	80.64	214.70	0.60	0.30	0.10	0.07	0.05	0.32	1.99

Fertilizers per stage

Fertilizers application

Multi-K GG 13-0-46 Potassium Nitrate

Haifa MAP - Mono Ammonium Phosphate

Haifa BitterMag Magnesium Sulphate

Haifa Cal GG Calcium Nitrate

Haifa Micro Combi

Borax - Disodium Tetraborate Decahydrate

Nutrigation system

Volume: **1000 liter**
Content: **Phosphorus**
Injection rate: **6.10 l/m3**
Fertilizer concentration: **20 %**

Volume: **1000 liter**
Content: **Calcium**
Injection rate: **4.44 l/m3**
Fertilizer concentration: **20 %**

Multi-K GG 13-0-46 Potassium Nitrate	**101.36 kg**
Haifa MAP - Mono Ammonium Phosphate	**15.49 kg**
Haifa BitterMag Magnesium Sulphate	**82.68 kg**
Borax - Disodium Tetraborate Decahydrate	**463 gram**

Haifa Cal GG Calcium Nitrate	**198.13 kg**
Haifa Micro Combi	**1.87 kg**

Stock solution nutrients content:

Tanks	Macronutrients (gram/liter)						Secondary Nutrients (gram/liter)			Micronutrients (mg/liter)						
	N_Total	N_NH4	N_NO3	N_NH2	P2O5	K2O	CaO	MgO	SO4	Fe	Mn	Zn	Cu	Mo	B	EC
Phosphorus | Tank 1	15.54	1.86	13.68	-	9.45	46.83	-	13.23	35.22	-	-	-	-	-	50	-
Calcium | Tank 2	30.71	2.18	28.53	-	-	-	52.50	-	-	130	70	20	20	10	-	-

F2 à F6

Nutrient supply for crop

Stage	Days	Macronutrients (ppm)						Secondary Nutrients (ppm)			Micronutrients (ppm)						
		N_Total	N_NH4	N_NO3	N_NH2	P2O5	K2O	CaO	MgO	SO4	Fe	Mn	Zn	Cu	Mo	B	EC (ds/m)
F2 à F6	45	230.57	20.57	210.00	0.00	62.00	343.40	201.80	80.64	214.70	0.60	0.30	0.10	0.07	0.05	0.32	2.00

Fertilizers per stage

Fertilizers application


Multi-K GG 13-0-46 Potassium Nitrate


Haifa MAP - Mono Ammonium Phosphate


Haifa BitterMag Magnesium Sulphate


Haifa Cal GG Calcium Nitrate


Haifa Micro Combi

Borax - Disodium Tetraborate Decahydrate

Nutrigation system

Volume: **1000 liter**
Content: **Phosphorus**
Injection rate: **6.76 l/m3**
Fertilizer concentration: **20 %**

Volume: **1000 liter**
Content: **Calcium**
Injection rate: **3.85 l/m3**
Fertilizer concentration: **20 %**

Multi-K GG 13-0-46 Potassium Nitrate	**109.97 kg**
Haifa MAP - Mono Ammonium Phosphate	**15.04 kg**
Haifa BitterMag Magnesium Sulphate	**74.57 kg**
Borax - Disodium Tetraborate Decahydrate	**417 gram**

Haifa Cal GG Calcium Nitrate	**197.84 kg**
Haifa Micro Combi	**2.16 kg**

Stock solution nutrients content:

Tanks	Macronutrients (gram/liter)						Secondary Nutrients (gram/liter)			Micronutrients (mg/liter)						
	N_Total	N_NH4	N_NO3	N_NH2	P2O5	K2O	CaO	MgO	SO4	Fe	Mn	Zn	Cu	Mo	B	EC
Phosphorus | Tank 1	16.65	1.80	14.85	-	9.17	50.81	-	11.93	31.77	-	-	-	-	-	50	-
Calcium | Tank 2	30.67	2.18	28.49	-	-	-	52.43	-	-	160	80	30	20	10	-	-

F6 à R2

Nutrient supply for crop

Stage	Days	Macronutrients (ppm)						Secondary Nutrients (ppm)			Micronutrients (ppm)						
		N_Total	N_NH4	N_NO3	N_NH2	P2O5	K2O	CaO	MgO	SO4	Fe	Mn	Zn	Cu	Mo	B	EC (ds/m)
F6 à R2	45	196.00	14.00	182.00	0.00	46.50	365.78	154.58	60.48	187.21	0.60	0.30	0.10	0.07	0.05	0.32	1.73

Fertilizers per stage

Fertilizers application


Multi-K GG 13-0-46 Potassium Nitrate


Haifa SOA Ammonium Sulphate


Haifa MKP Soluble monopotassium phosphate


Haifa BitterMag Magnesium Sulphate


Haifa Cal GG Calcium Nitrate


Haifa Micro Combi


Borax - Disodium Tetraborate Decahydrate

Nutrigation system

Volume: **1000 liter**
Content: **Phosphorus**
Injection rate: **6.16 l/m3**
Fertilizer concentration: **20 %**

Volume: **1000 liter**
Content: **Calcium**
Injection rate: **2.96 l/m3**
Fertilizer concentration: **20 %**

Multi-K GG 13-0-46 Potassium Nitrate	**117.82 kg**
Haifa SOA Ammonium Sulphate	**5.86 kg**
Haifa MKP Soluble monopotassium phosphate	**14.51 kg**
Haifa BitterMag Magnesium Sulphate	**61.35 kg**
Borax - Disodium Tetraborate Decahydrate	**458 gram**

Haifa Cal GG Calcium Nitrate	**197.19 kg**
Haifa Micro Combi	**2.81 kg**

Stock solution nutrients content:

Tanks	Macronutrients (gram/liter)						Secondary Nutrients (gram/liter)			Micronutrients (mg/liter)						
	N_Total	N_NH4	N_NO3	N_NH2	P2O5	K2O	CaO	MgO	SO4	Fe	Mn	Zn	Cu	Mo	B	EC
Phosphorus | Tank 1	17.14	1.23	15.91	-	7.55	59.37	-	9.82	30.38	-	-	-	-	-	50	-
Calcium | Tank 2	30.57	2.17	28.40	-	-	-	52.26	-	-	200	100	30	30	20	-	-

R3 à fin récolte

Nutrient supply for crop

Stage	Days	Macronutrients (ppm)						Secondary Nutrients (ppm)			Micronutrients (ppm)						
		N_Total	N_NH4	N_NO3	N_NH2	P2O5	K2O	CaO	MgO	SO4	Fe	Mn	Zn	Cu	Mo	B	EC (ds/m)
R3 à fin récolte	45	182.00	14.25	167.75	0.00	43.01	293.00	166.27	60.48	186.39	0.60	0.30	0.10	0.07	0.05	0.32	1.62

Fertilizers per stage

Fertilizers application


Multi-K GG 13-0-46 Potassium Nitrate


Haifa SOA Ammonium Sulphate


Haifa MKP Soluble monopotassium phosphate


Haifa BitterMag Magnesium Sulphate


Haifa Cal GG Calcium Nitrate


Haifa Micro Combi

Borax - Disodium Tetraborate Decahydrate

Nutrigation system

Volume: **1000 liter**
Content: **Phosphorus**
Injection rate: **5.36 l/m3**
Fertilizer concentration: **20 %**

Volume: **1000 liter**
Content: **Calcium**
Injection rate: **3.18 l/m3**
Fertilizer concentration: **20 %**

Multi-K GG 13-0-46 Potassium Nitrate	**106.98 kg**
Haifa SOA Ammonium Sulphate	**6.53 kg**
Haifa MKP Soluble monopotassium phosphate	**15.43 kg**
Haifa BitterMag Magnesium Sulphate	**70.53 kg**
Borax - Disodium Tetraborate Decahydrate	**526 gram**

Haifa Cal GG Calcium Nitrate	**197.39 kg**
Haifa Micro Combi	**2.61 kg**

Stock solution nutrients content:

Tanks	Macronutrients (gram/liter)						Secondary Nutrients (gram/liter)			Micronutrients (mg/liter)						
	N_Total	N_NH4	N_NO3	N_NH2	P2O5	K2O	CaO	MgO	SO4	Fe	Mn	Zn	Cu	Mo	B	EC
Phosphorus | Tank 1	15.81	1.37	14.44	-	8.02	54.67	-	11.29	34.78	-	-	-	-	-	60	-
Calcium | Tank 2	30.60	2.17	28.42	-	-	-	52.31	-	-	190	90	30	20	20	-	-

Environmental Footprint

Environmental parameters	Haifa-fertigation	Topsoil application	Fertigation rating performance
Env. Footprint single score µPt/Kg produce	3.74e+3	4.70e+3	**BETTER**
Carbon footprint kg CO2 eq./Kg produce	1.66e-2	2.67e-2	**EXCELLENT**
N leaching kg NO3/Kg produce	2.01e-5	1.01e-4	**EXCELLENT**
N runoff kg NO3/Kg produce	1.94e-6	1.22e-5	**EXCELLENT**
N volatilization kg NH3/Kg produce	1.39e-5	1.92e-4	**EXCELLENT**
Eutrophication, freshwater kg P eq./Kg produce	4.52e-6	8.94e-6	**EXCELLENT**

*INDEX (Fertigation vs Topsoil)

EXCELLENT	BETTER	EQUAL	BAD	WORSE
>30%	10 to 30%	10 to -10%	-10 to -30%	<-30%

* % Difference between fertigation and topsoil application

NutriNet calculates the difference between the environmental footprint of fertigation programs compared to top-soil fertilizer application. In both cases NutriNet uses the same field characteristics, however, fertilizer composition is different and thus the overall values of the environmental footprint are different.