

## 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

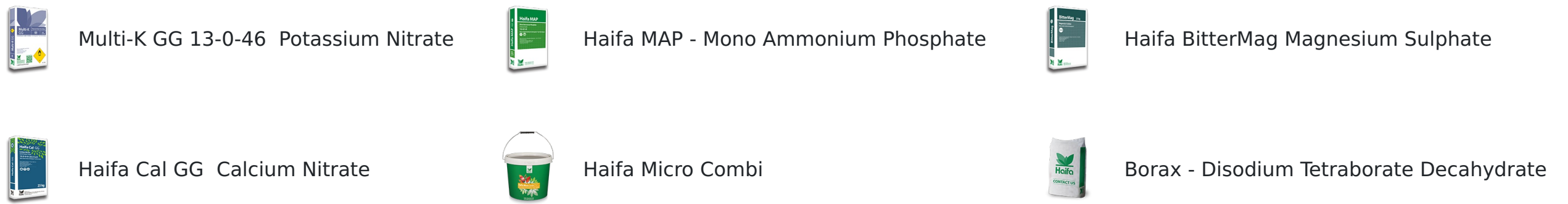
### Plantation à F2

#### 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



##### Nutrigation system

**Tank 1**  
 Volume: **1000 liter**  
 Content: **Phosphorus**  
 Injection rate: **6.10 l/m3**  
 Fertilizer concentration: **20 %**

**Tank 2**  
 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

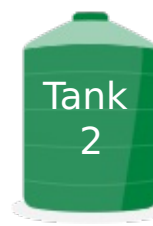
#### Fertilizers application

	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	-	-

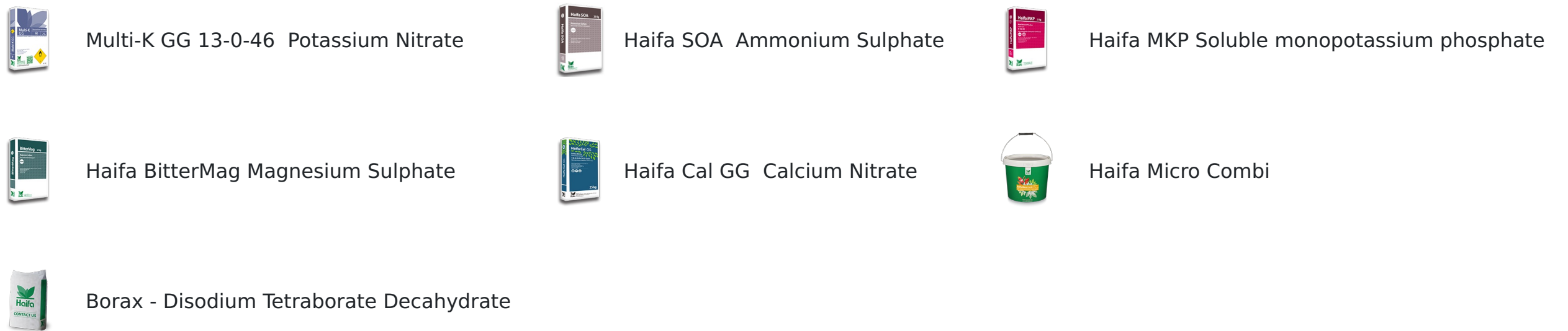
## F6 à R2

### 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



#### Nutrigation system

**Tank 1**  
 Volume: **1000 liter**  
 Content: **Phosphorus**  
 Injection rate: **6.16 l/m3**  
 Fertilizer concentration: **20 %**

**Tank 2**  
 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	-	-

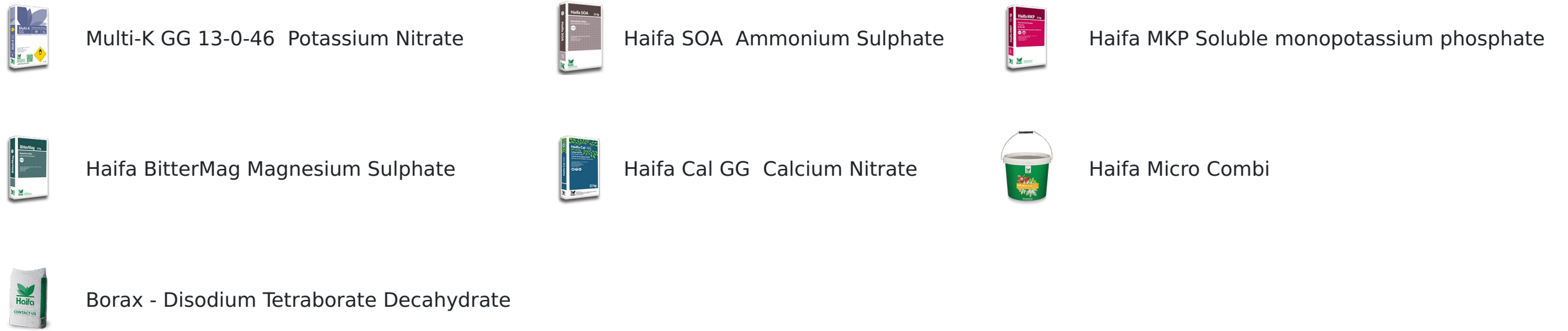
### R3 à fin récolte

#### 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



#### Nutrigation system

**Tank 1**  
 Volume: **1000 liter**  
 Content: **Phosphorus**  
 Injection rate: **5.36 l/m3**  
 Fertilizer concentration: **20 %**

**Tank 2**  
 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
<b>Env. Footprint single score</b> $\mu\text{Pt/Kg produce}$	3.74e+3	4.70e+3	<b>BETTER</b>
<b>Carbon footprint</b> kg CO2 eq./Kg produce	1.66e-2	2.67e-2	<b>EXCELLENT</b>
<b>N leaching</b> kg NO3/Kg produce	2.01e-5	1.01e-4	<b>EXCELLENT</b>
<b>N runoff</b> kg NO3/Kg produce	1.94e-6	1.22e-5	<b>EXCELLENT</b>
<b>N volatilization</b> kg NH3/Kg produce	1.39e-5	1.92e-4	<b>EXCELLENT</b>
<b>Eutrophication, freshwater</b> kg P eq./Kg produce	4.52e-6	8.94e-6	<b>EXCELLENT</b>

\*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.