

# HYDROFLOW

## Water Soluble Hydroponic Fertilizer Mix

65 g/kg N	45 g/kg P	240 g/kg K	30 g/kg Mg	60 g/kg S
	1.68 g/kg Fe	0.40 g/kg Mn	0.50 g/kg B	
	0.20 g/kg Zn	0.03 g/kg Cu	0.05 g/kg Mo	

### Fertilizer Group 1

Reg. No. K6256 Act 36 of 1947

### GROUND UP FERTILIZERS cc

Registration No: 2008 0672/2823

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### GENERAL INFORMATION

Hydroflow is a water soluble combination of plant nutrients suitable for use in hydroponic (soilless) crop production systems, and when used together with potassium sulphate and/or calcium nitrate it is a balanced source of macro- and micronutrients. When Hydroflow is applied to the irrigation water as directed, the nutrients are readily available and provide for optimum plant growth and high yields of good quality.

## APPLICATION RATE (g per 1000 L water)

CROP	HYDROFLOW	HORTICAL CALCIUM NITRATE	POTASSIUM SULPHATE	EC at 25°C in distilled water
CUCUMBERS				
1. Summer	1000	1000	-	1.9 mS/cm
2. Winter	1000	900	150	2.2 mS/cm
TOMATOES				
1. To flowering of third Truss.	1000	640	-	1.8 mS/cm
2. After third Truss flowering	1000	640	250	2.1 mS/cm
CELERY, LETTUCE & LEAF CROPS				
1. Summer	1000	740	-	1.9 mS/cm
2. Winter	1000	640	150	2.0 mS/cm
FLOWER CROPS				
1. Summer	1000	740	-	1.9 mS/cm
2. Winter	1000	640	150	2.0 mS/cm

### PREPARING A CONCENTRATED SOLUTION

This method may be followed when it is possible to dispense the concentrate solution into the irrigation lines by means of fertilizer diluters. To prepare a 100 times concentrate, dissolve 10 kg Hydroflow in 100 litres of water in a tank. Apply Potassium Sulphate (Potassium Sulphate - Horticultural Grade), when required at a rate of 1.5 kg or 2.5 kg per 100 litres of water. (i.e. 10 times the quantity as indicated in the table above). Hortical Calcium Nitrate must be dissolved in a separate tank from the other fertilizers. Once again use 10 times the quantity indicated in the table per 100 litres water. To use this concentrate solution, mix 1 part from the first tank and 1 part from the second tank, together with 98 parts irrigation water.

These concentrated solutions should be injected simultaneously but separately into the main irrigation line (i.e., by using 2 injection pumps). Should the solutions mix in the concentrated form a precipitate will immediately form. To prevent this, injection points in the main line should be at least 1.5 m apart.

The above is just one example of a concentrate solution. Other more convenient methods may be used so long as, after mixing with the irrigation water, the concentrations concur with those as indicated in the table. It is not recommended that concentrate solutions of Hydroflow in excess of 100 x be made up.

### PREPARING A SOLUTION FOR DIRECT APPLICATION:

To prepare 1000 litres of nutrient solution for direct application, dissolve 1000 g Hydroflow in 500 litres of water. Add a further 250 litres of water and if Potassium Sulphate is required add at the recommended rate and stir until dissolved. Finally add the last 250 litres of water together with Hortical Calcium Nitrate. In both circumstances it is important that the solutions are well agitated prior to application.

### PRECAUTIONS

Concentrated solutions of Hydroflow and Hortical Calcium Nitrate, must not be mixed together in order to ensure that it does not precipitate. In situations where plants are grown in containers it is advisable that these containers be leached periodically. Only high quality raw materials are used in the manufacture of Hydroflow. In spite of this a small, insoluble residue might occur in the tank. The quantity of sediment that occurs is largely dependent on the water quality. Should this sediment be particularly bad or cause problems of another nature it is recommended that the water be analysed and contact made with Ground Up Fertilizers for further advice.

### GUIDELINES FOR USING HYDROFLOW

Newly planted seedlings can be fed using nutrient solutions at 70% of the rates given above, increasing the strength of the nutrient solution progressively as plants grow, to reach the tabulated levels during periods of rapid vegetative growth or increasing fruit load.

Plants carrying a heavy fruit load will require a higher feeding rate than plants carrying a light crop. Such plants will also have a higher water requirement and the higher irrigation rate will supply a significant amount, if not all, of the increased nutrient requirement of the plant. Correct water management is therefore of great importance. As a general principle fewer irrigations applying more water is preferred to the alternative of many daily irrigations of small water volumes per irrigation. The number and amount of irrigations will also depend on the water holding capacity of the growing medium. A 15 to 20% over irrigation with each watering is a commonly recommended norm and if this is followed adequate wetting of the root zone should be assured. If, in spite of an adequate watering regime, plants carrying a heavy fruit load appear to be stressed, a 10 to 15% increase in the nutrition rate could be applied. This increase would apply to all three ingredients in the above table, but would not apply to the addition of acid to the water.

The degree of management required to optimize results, as indicated above, will be difficult to achieve when a central water source is used to supply nutrient solution to many tunnels in which various crops, in various stages of growth, are present at any one time. In such cases an "averaged" program will need to be adopted. Hydroflow Ultra recipes embody a sufficient degree of latitude with regard to plant safety and efficacy to make such averaging feasible. Growers are invited to discuss such difficulties with a representative of Ground Up Fertilizers

When using concentrated stock solutions it is possible to regulate the concentration of the nutrient solution by adjusting the solution EC. Many growers increase the EC of their nutrient solutions in winter by 0.2 to 0.5 mS/cm to compensate for reduced water utilization by the plant. One should be aware that the EC value is also influenced by temperature. The same nutrient solution will have a lower EC during cooler winter months than during summer months. Some EC meters have an automatic temperature compensating mechanism others do not. Maintaining EC at a fixed value from summer through winter, using an EC meter without temperature compensation will automatically result in an increase in the concentration of the nutrient solution during winter months. It is therefore important to check on the attributes of the EC meter in use.

## **PRECAUTIONS**

Only high quality raw materials are used in the manufacture of Hydroflow, Hortical Calcium Nitrate and Potassium Sulphate. In spite of this a small, insoluble residue might occur in the tank. The quantity of sediment that occurs is largely dependent on the water quality. Should this sediment be particularly bad or cause problems of another nature it is recommended that the water be analyzed and contact made with a representative of Ground Up Fertilizers for assistance.