H2K Agro®

i-SoL

A Comprehensive Fertilization Solution

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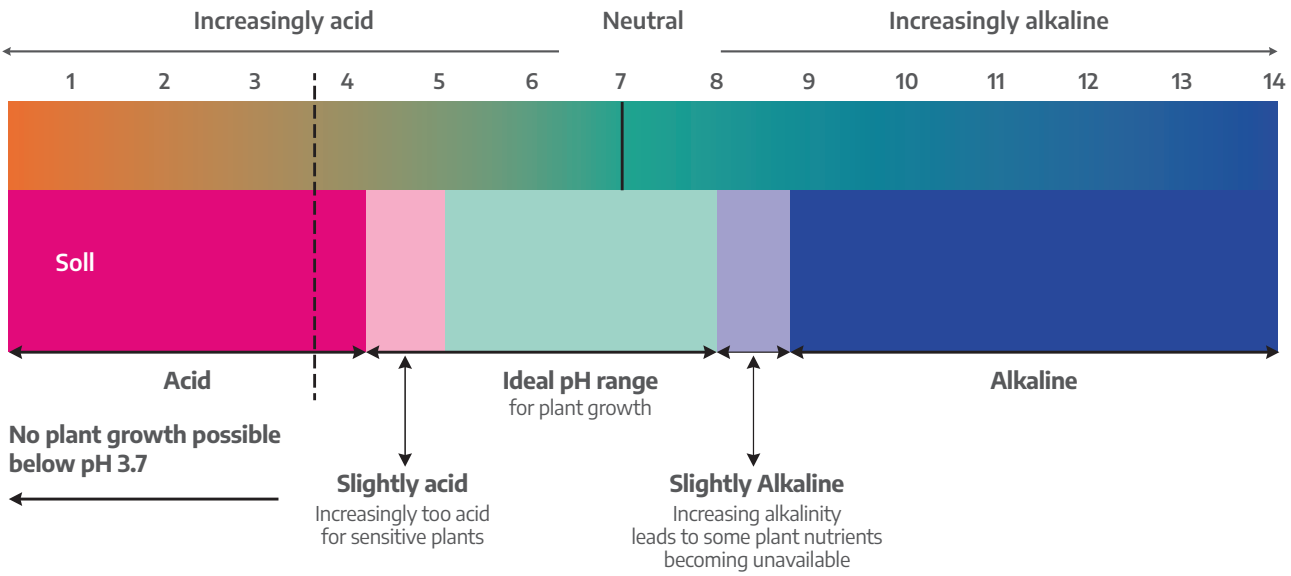
A primary consideration must be made to properly understand the principle of i-SoL, a novel and innovative nutrition solution for plants. Any plant that we grow, needs a media to grow in, that media could be soil, or a designed media in case of Hydroponics or soil less farming, or even in case of nutrient film technique, just a nutrient solution. That media will work as a site for the exchange of nutrients between plants and itself. For this nutrient exchange to happen, the media must have a particular characteristic of pH and Electrical Conductivity (EC). Along with other parameters such as moisture content, temperature, oxygen concertation and so on, these two characteristics (pH and EC) will play a vital role in facilitation of the exchange of nutrients.

Soil pH is a major variable since it relatively influences almost all the metabolic functions of a living organism thriving on that soil. When considering a plant, the soil pH completely influences the nutrient availability to the root system's access and eventually the plant.

- Consecutively, the soil pH also determines the rates and states of ionisation of mineral components of the soil, which would be solubilized and thence miscible in the water that feeds up the rooting system.
- Also, pH determines the rates of decomposition of organic matter by microorganisms and the optimal pH for their growth and survival.
- pH around 6 to 7.5 is appropriate for plant metabolism, nutrient availability and pathogen control. Although this very well depends on the crop selection and farming practices employed.
- With a balance of pH, a metabolic equilibrium can be achieved which is beneficial for stress resistance and productivity

Plant growth and pH ($CaCl_2$) scale.

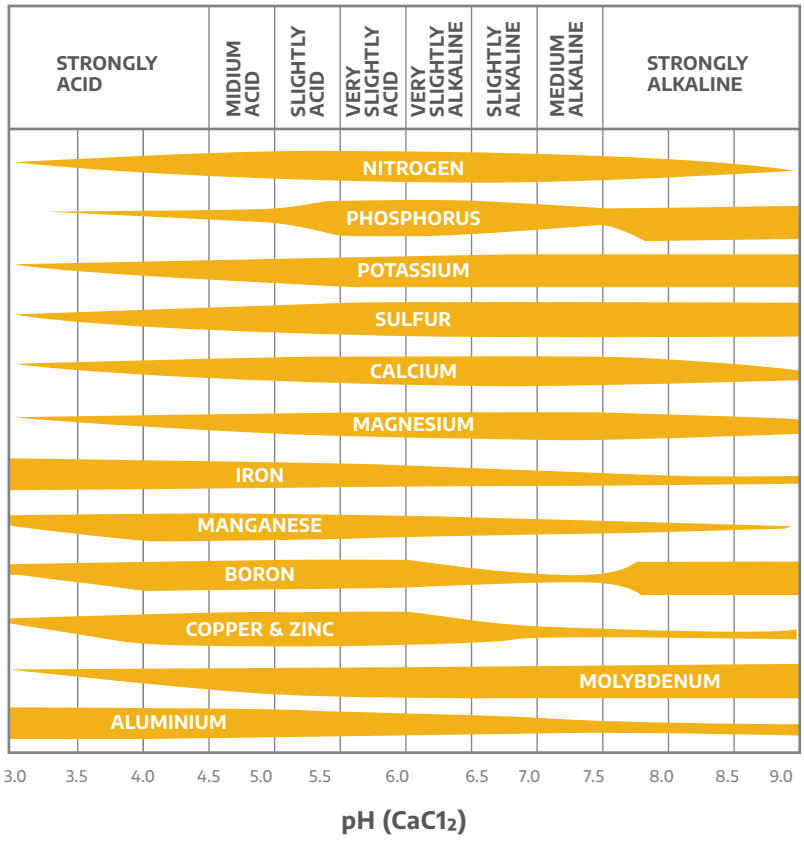


Soil electrical conductivity (EC) is a measurement that correlates with soil properties that affect crop productivity, including soil texture, soil mineral composition, cation exchange capacity (CEC), drainage conditions, organic matter level, salinity, and subsoil characteristics.

- The electrical conductivity of soils varies depending on the amount of moisture held by soil particles. Sands have a low conductivity, silts have a medium conductivity, and clays have a high conductivity. Consequently, EC correlates strongly to soil particle size and texture.
- EC is related to percent of clay and organic matter (O.M.). As the percent of clay and organic matter increase, the CEC also increases. Research bears out the correlation between conductivity and CEC through its relationship to clay.

Principle of i-SoL:

i-SoL utilises the principle of ionisation of nutrient salts for improving their mobility and availability in a given nutrient solution, addressing the Fertilizer Use Efficiency in a given agricultural system. As we are aware that solubility of ions of minerals salts depend on the pH of the media, the right pH maintained along with substantial buffering capacity of the media, the nutrient capacity can be enhanced. The documented ranges of the mineral ions are as below:



If above range of pH are maintained for the corresponding nutrient, its availability shall be maximum. Exact maintenance of the pH ranges may not be possible; hence, we shall take a broader range to maintain such as 5.5-6.5 which encapsulates availability of all the given ions. The inputs by H2K Technologies shall expediate the Ionisation of these nutrients and then facilitate the maintenance of the pH range to keep the nutrition solution ionised. This shall decrease the over abundant use of farm inputs of fertilizers to consequently save expense and soil deterioration while improving crop performance.

Attributes of i-SoL:

1. IEC / H2K Agro Possesses numerous proprietary formulations of Bioavailable Nutrients and Organic Acids which allow exceptional ionisation of compounds with negligible miscibility or reactivity.

2. Such an example is IEC's WHOLESOME which contains a significant concentration of elemental Sulphur in a blend of IEC's Proprietary Organic Acids.

3. Similarly, IEC has several other formulations dedicated to making mineral elements and salts bioavailable like O-PHOS which contains naturally extracted Phosphate which is a precursor for phosphate solubilisation and mobilisation and an activator for PSB and PMB.

4. Then there is AQUACHIL which is a combination of Natural Organic Acids which can ionise almost any mineral salt or increase their solubility and can be essential to curbing soil salinity and managing good soil salt index.

5. Likewise, IEC has I-SURGE, a formulation which contains a combination of salts of micronutrients Fe, Zn, Mn, B, and Cu with inimitably processed with Humic acid, Sea-Weed Extract and a mix of Amino-acid which aids in faster mobilisation of nutrients and activate and involve local microbes to assist in the said mobilisation.

6. In addition, IEC / H2K Agro has several formulations which can address certain typical issues at farm and allow simplification for farming systems and gaining more controlled conditions for resource management and soil and Plant health.

Benefits of i-SoL:

By adopting these formulations, a farmer can reap benefits as mentioned below:

1. **Reduction in fertilizer** requirements **up to 40 – 50%**

2. No more over loading of fertilizers in soils, hence better soil **pH management**

3. No excess Nitrogen uptake, hence **reduced sucking pest & related diseases**

4. **Better flower & fruit** set and uniform fruit size & shape

5. **Lesser labour & material cost** in account of Pest Management Formulation:

6. **Standardized** nutrition program that will bring quality assurance of the buds as in the case Of medicinal Cannabis industry.

7. **Pesticide Free** technology when coupled with the balance of the system.

8. i-SoL is a revolutionary Nutritional System which will **Chelate the ions / minerals** which by Definition are **Inorganic.** The process of Chelation will render the minerals **Organic** and will Improve the **Bioavailabilty** of the minerals exponentially.

9. The result is that **The Cannabis Plants** will be nourished by a system that is Researched & Developed by scientists for maximizing the plants natural tendency to produce **Cannabinoids** Which can support our own " **Endocannabinoid** " System and positively influencing this Amazing system which every human being has as its principal controller.

Secondary Culture Lab Test Results

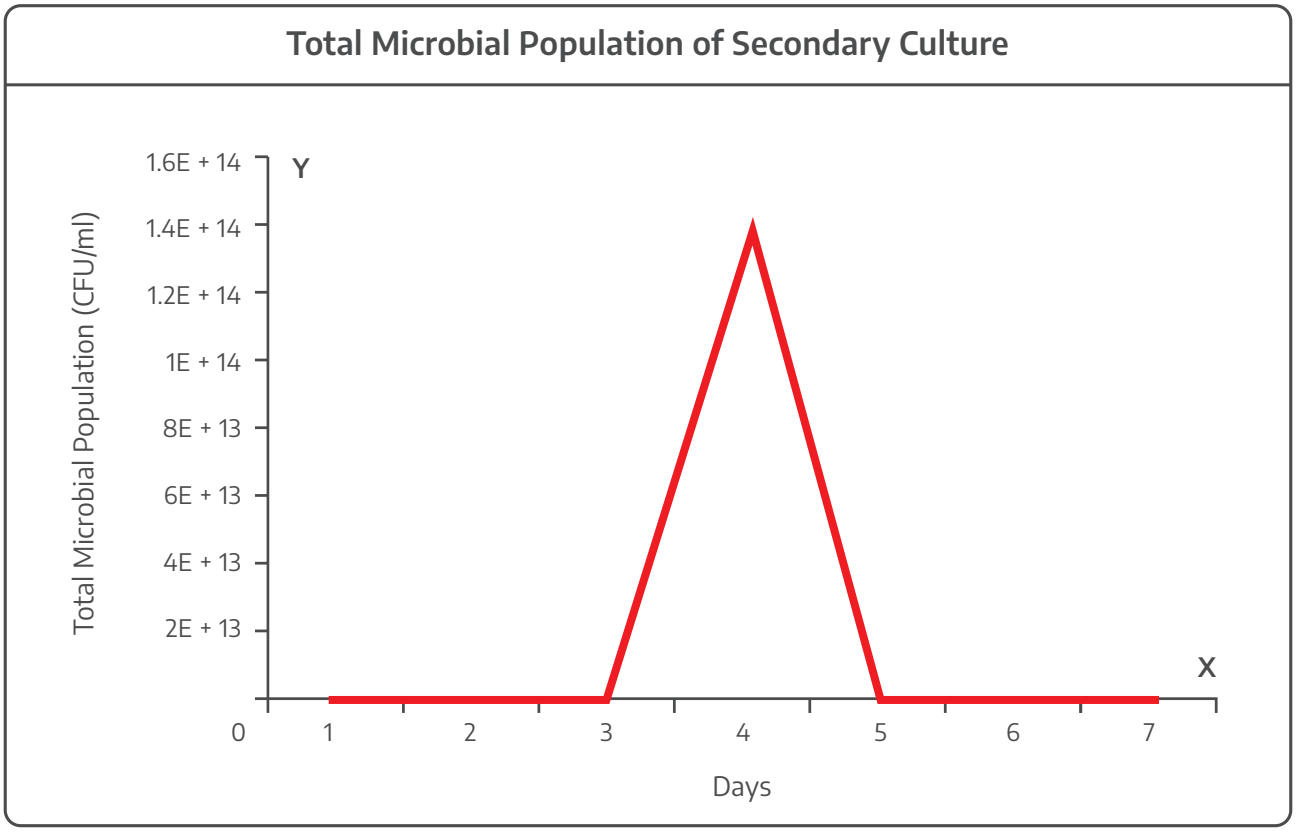
Results of total microbial population of Lactobacillus sporogenes and Saccharomyces cerevisiae in secondary culture over seven (7) days

Table 1 shows the total microbial population of Lactobacillus sporogenes and Saccharomyces cerevisiae in the secondary culture over seven days

Table 1

Day	Total Microbial Count (CFU/ml)
1	3.0×10^{1}
2	4.15×10^{7}
3	1.26×10^{8}
4	1.38×10^{14}
5	2.26×10^{9}
6	1.74×10^{8}
7	3.30×10^{5}

The graph below shows the total microbial population of ***Bacillus coagulans*** and ***Saccharomyces cerevisiae*** in the Secondary Culture over seven days.



Explanation of results

When microorganisms are introduced to a new environment they go through what is referred to as a lag stage. During this period they are adjusting to the new environment and replication is slow. Days 1 to 3 depict the lag stage on the graph above. After the organisms have gotten accustomed to the media their growth and replication rate increases exponentially and the medium is exploited at the maximal rate. This is seen between days 3 and 4 on the graph. As the microbes continue to grow the nutrient supply is used up and waste materials and toxic metabolites start to accumulate. These unfavorable conditions results in a reduction in the replication rate and eventually the organisms begin to die. This is referred to as the death stage and is depicted from day 4 onwards on the graph.

For all Soil Conditions

Pre-Mixture

In a 20 L pail take
100 ml Aquachil
with 15 L water.

ADD
500 g Hydrated Lime
[$Ca(OH)_2$]

OR
1 kg Calcium Carbonate
[$CaCo_3$]

Stir well until dissolved. Strain with soft cloth and pour contents to Mixture 1.

80 L WATER
+
← Pre-Mixture
+
500ml
Wholesome
+
500ml
I-SURGE
+
500ml
O-PHOS
(WIO)

Stir well to mix lime.

+

100 L WATER
+
3 kg
Urea [$CO(NH_2)_2$]
+
1 kg
Potassium Nitrate
(13:00:45)-KN03
+
750 g
Magnesium Sulphate
($MgSO_4$)
+
1 kg
Calcium Nitrate
($CaNO_3$)
+
2 kg
Di-Ammonium
Phosphate
$(NH_4)_2 HPO_4$
+
300 g
Zinc Sulphate

+

H2K Agro®

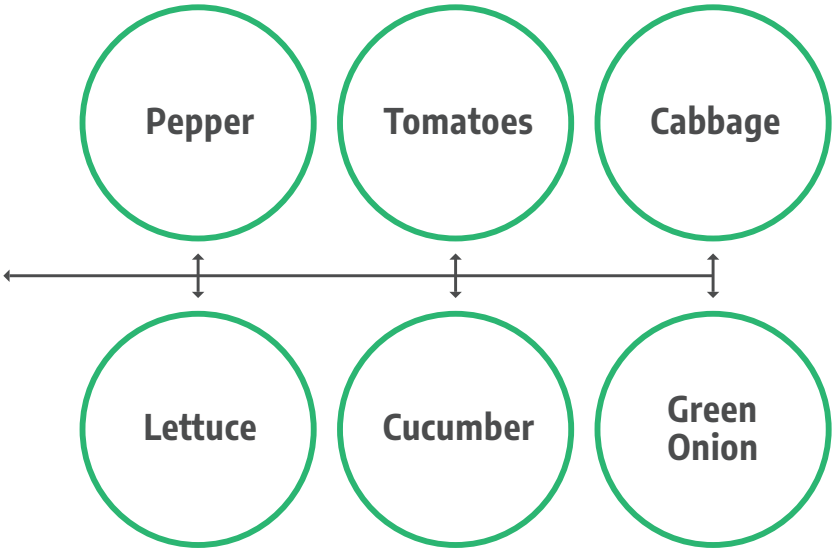
ISOL
1 Acre 3 months
Program (See Below)

iMicro
Mix Micronutrients Blend 120g

20 g
Ammonium Molybdate
H8MoN2O4
+
100 g
Micro-Nutrients Mix
Grade IV
+
Zinc [Zn - 6%]
Iron [Fe - 4%]
Manganese [Mn-0.5%]
Boron [B - 0.2%]
Copper [Cu-0.2%]

Stir well to mix

i-SoL can be used on any Crop



Application	12 Weeks (3 months) per Acre											
Step	1	2	3	4	5	6	7	8	9	10	11	12
i-SoL, Litre	40	40	40	60	60	60	80	80	80	100	100	100
Secondry Culture, Litre		50				50				50		
Foliar i-SoL Litres			20	20	20	20	20	20	20	20	20	20