

WATER SOLUBLE FERTILIZERS: A LIQUID SOLUTION FOR CROPS

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INTRODUCTION:

As the name suggests, water soluble fertilizers (WSFs) dissolve completely in water. Nutrients delivered through WSFs are more efficiently absorbed by the plant as compared to those supplied through traditional fertilizers. With WSFs, it is easy to make available to the plant precise controlled amount of nutrient in a given time period.

World population will reach 9.7 billion by 2050 and agriculture will play a central role in feeding this burgeoning population. India's population is expected to reach 1.69 billion by 2050. Producing sufficient food will require utilization of modern agricultural technologies and inputs such as WSFs. These fertilizers have the proven benefits in terms of raising agricultural productivity and are, therefore, expected to experience a meteoric surge in demand.



CHARACTERISTICS OF WATER SOLUBLE FERTILIZERS

- ✓ The nutrient element must be present in form of readily available to the plants
- ✓ High purity, fully soluble fertilizer, composed entirely of plant nutrients(p & K)
- ✓ Use lowest salt index fertilizer
- ✓ Spray solution is buffered at pH
- ✓ Sodium and chloride free
- ✓ No heavy metals
- ✓ Absence of nitrogen allows for balancing / controlling N independently
- ✓ Balanced nutrient composition
- ✓ Excellent physical properties



Better physical properties of WSF

ADVANTAGES OF WATER SOLUBLE FERTILIZERS – FERTIGATION

- ✓ WSF are supplied as foliar and fertigation. They are also suitable for soil application depending on requirement
- ✓ Minimizing soil pollution, Soil and water erosion are prevented
- ✓ Reduction in labour and energy cost by use of water distribution systems for nutrient application
- ✓ Wide ranges of nutrient grades are available
- ✓ Even distribution of nutrients and supplying the nutrients directly to the effective root zone
- ✓ Ensures a uniform flow of water and nutrients.
- ✓ Fertilizer use efficiency is more than the conventional methods
- ✓ Timely application nutrients possible



WSF being used in foliar application

COMPARISON BETWEEN THE CONVENTIONAL FERTILIZERS AND WATER SOLUBLE FERTILIZERS

Properties	Water soluble fertilizers	Conventional fertilizers
Solubility	Readily soluble in water	Nutrient may be in soluble form carrier material not fully soluble
Uniformity of nutrient ions	Ionic distribution uniforms depending upon concentrations & composition of base material used	Ionic distribution not uniform
Solubility time for preparation of solution	1 to 4 minutes in water	12 to 24 hours 25° C
Filtration of solution before application	Not required	Filtration is required
Salt index	8 to 40	It varies
Nutrient use efficiency	Very high	Higher if applied in split
Cost	High	Less compared to WSF

LIMITATIONS OF WSF

- ✓ High initial investment
- ✓ Maintenance of drip irrigation is difficult
- ✓ Good quality water is very essential
- ✓ Clogging of emitters may cause a serious problem
- ✓ Costly and limited availability of water soluble fertilizers
- ✓ Infestation of insects pest and diseases increases
- ✓ Chemical reaction in drip system leading to corrosion and precipitation of fertilizer
- ✓ Toxic to human beings

CONCLUSION

In the view of increasing population with the same acreage of land we have to produce more food grains to satisfy the human hunger. The conventional fertilizers can't fulfil the nutrient requirement of the crops and hence, the alternate solutions for the crops is water soluble fertilizers.

