

# **The Report of Action Principles & Application Technology of Seaweed Extract Fertilizer**





# The theory of Alga Bioactive Substances

The active substance researched in Seaweed extract:

- Cytokinins
- Auxins
- Gibberellins
- Abscissic acid
- Ethylene
- Betaines

## The contrast of main component between *Sagassum* sp and *Ascophyllum nodosum*

Item	Sogassumsp	Ascophyllum nososum
Protein	7.2	5.7
Fat	2.8 2.8	2.6
Fibre(cellulose)	5.3 5.3	7.0
Mannitol	8. 8.7	4.2
Alginic acid	30. 30.5	26.7
Methypentosans Laminar	--- -----	7.0
Laminarin	10. 10.1	9.3
Undefined Sugars	7.3	14.4
K	5.55	1.280000
Cu	0.001	0.000635
I	0.261	0.062400
Fe	0.945	0.89560
Mg	0.365	0.213000
Mn	0.110	0.123500
Zn	0.004	0.003516
Ca	2.060	1.904000
Water	7.3	10.7



# Ten Function of Seaweed Fertilizer

Seaweed extract products contain non-nitrogen organic substances, vitamins, amino acids and microelements such as copper, iron, zinc and magnesium etc. which are rare in terrestrial plants. In particular, they contain alginic polysaccharide, alginic acids and highly unsaturated fatty acids, which are unique from seaweed, and plant growth regulators, such as auxin, cytokinin, gibberellin and abscisic acid. These ingredients have good biological activity, facilitate to stimulate internal unspecific active factors and regulate the balance of endogenous hormones.

1. Increased Yield and Quality
2. Broad-spectrum Mineralisation:
3. Natural Chelation:
4. Improved Soil Structure and Water Holding Capacity
5. Pronounced Fungal Stimulation:
6. Improve plant anti-stress capability:
7. Enhanced Immune Response:
8. Management of Nematode-Affected Soils :
9. Frost Resistance:
10. Increased Shelf-Life:



# Ten Function of Seaweed Fertilizer (1)

- **1. Increased Yield and Quality**

Increased root growth is an important part of yield building and quality improvement. In turf trials, seaweed fertilizer treated plots had 67% to 175% more roots than untreated plots, and plots treated during autumn showed a 38% increase in spring growth and 52% more roots than untreated plots. For fruits and vegetables, foliar applications of seaweed fertilizer consistently increased yield from 15.5% to 26.4% during a three-year trial period.

- **2. Broad-spectrum Mineralisation:**

Seaweed contains the full mineral spectrum, because it grows in seawater. There are never droughts or crop failures in this aquatic environment and an abundance of food is always assured, because, as we impoverish the land through poor management, the eroded material simultaneously enriches the ocean.

- **3. Natural Chelation:**

Chelation involves the neutralisation of positively charged elements (cations) to facilitate their easy entry into the negatively charged plant. Minerals can be seven to ten times more plant-available in chelated form. Kelp contains a powerful chelating agent called Mannitol, which naturally chelates the full suite of cations already present in seaweed. There is also sufficient Mannitol (10% of dry weight) to offer chelation capacity for any other cations that may be applied in conjunction with seaweed fertilizer.

- **4. Improved Soil Structure and Water Holding Capacity**

Alginic acid, is a soil conditioner, which combines with metallic elements to form cross-linked polymers of greatly increased molecular weight. These salts swell when wet and retain moisture tenaciously. In the process, they help the soil to form a crumb structure. Part of this crumb forming process is physical and part is biological.

- **5. Pronounced Fungal Stimulation:**

Seaweed contains a rich lode of long-chain sugars, which are specific fungi foods. Fungi form the aggregates which are the essence of crumb structure. They are also intimately involved in nutrient availability, decomposition and disease protection.



# Ten Function of Seaweed (2)

## **6. Improve plant anti-stress capability:**

Stress in plants, as in animals, is a reaction to some kind of threat or environmental change and it generates a hormonal response. The hormones found in seaweed can have a huge impact on controlling or reducing that stress. Stress can be linked to growth phases. Germination is the first stress period. Gibberellic acid is a proven germination promoter. A seaweed-based starter solution will enhance germination rates and reduce germination time. Lettuce seeds, for example, will germinate in the dark with gibberellic acid. The switch from vegetative to the reproductive phase can also be stressful. A seaweed fertilizer spray prior to budburst has proven very productive. Gibberellins have been linked to the onset of flowering, while cytokinins have been linked to bud formation.

## **7. Enhanced Immune Response:**

Anecdotal evidence, since the 1940s, has highlighted a link between growth regulators and immune response. Comprehensive experiments carried out in the 1960s, involving red spider mites in peaches and apples and aphids on strawberries, confirmed this link. The gibberellins in seaweed seemed to be the key.

## **8. Management of Nematode-Affected Soils :**

There are three mechanisms at work here. Seaweed stimulates the proliferation of nematode-trapping fungi, and this biological management accounts for part of the response. Seaweed also contains several antibiotics, which may be playing a role and, once again, hormones are playing a role. Cytokinins, for example, have demonstrated a capacity to inhibit larval penetration of plant roots.

## **9. Frost Resistance:**

Seaweed is a highly effective brix-builder. High-brix plants have a higher sugar content, which translates to a lower freezing point. A two to five degree frost protection has been recorded. Seaweed also contains abscissic acid and polyamino compounds, which have also been shown to protect crops from frost damage.



## 10. Increased Shelf-Life:

Experiments with peaches produced a 300% decrease in susceptibility to post-harvest rot for crops that had been foliar-sprayed with seaweed fertilizer twice before harvest. There also appears to be considerable potential for post-harvest dipping. A significant increase in the shelf-life of capsicums has been demonstrated following immersion in seaweed extract.

