

EliQzer (A Brown Kelp) clinically proven for splendid stress buster of crop to get good yield

Mr. Keshav Anand, Mr. Uday Anand, Mr. Shivraj Anand, Mr. Sandeep Datta, Dr. Mona Joshi, Nidhi Kumari and Mr. Durgesh Kumar Chaudhary

Parijat Industries (India) Pvt. Ltd
M-77, M-Block Market, Greater Kailash Part-II
New Delhi-110048 (India)

DOI: 10.29322/IJSRP.9.04.2019.p8854
<http://dx.doi.org/10.29322/IJSRP.9.04.2019.p8854>

Abstract- The aim of the present study is to depict the benefits of the bio-stimulants available in the market. The present study explores the benefit of the product EliQzer clinically proven by Parijat Industries for its extensive benefits which is found acting as a best stress buster for the crop. The composition of this crop buster EliQzer consists of naturally occurring compounds which aids the cell division and elongation which in turn results in increased Leaf Index area & Chlorophyll level. It increases the flower production and qualitative and quantitative yield along with enhanced shelf life.

Index Terms- Carotenoids, Cell division, Nutraceutical, Root -zone, Shelf life, Stimulants, Cold extraction process

1. INTRODUCTION

Agriculture and its allied sectors are unquestionably the largest livelihood provider in India, more so in the vast rural areas. It also contributes a significant figure to the Gross Domestic Product (GDP). The paradigm shifts to be a significant nation in the globe being the largest producers in Pulses, Wheat, Rice, etc. has been a very arduous task. It has taken in a lot of research and diligence on the part of the scientists and the tremendous drudgery on the part of the farmers that today we can proudly say that India is self-sufficient in feeding its population.

The green revolution unlocked with it a serious of Crop protection technologies, and people became aware of the use of pesticides and Plant growth promoters, and how its use could increase the production. As time advanced new advancements and introductions paved its way into crop protection and crop care. People become more aware about the various crop nutrients and Bio-stimulants that can help them boost the actual potential of the crop and ultimately get good yields. All this brings us to the current situation where just in the Plant growth promoter segment, we have a series of products ranging from the amino acids, humic acid based products to advanced combinations of plant extracts. Currently we have diverse formulations of compounds, substances and micro-organisms that are applied to plants or soils to improve crop vigor, yields, quality and tolerance of abiotic stresses. Nowadays, in respect to Plant Nutrients, brown kelps are also considered to be promising resources of functional ingredient in the development of novel products Brown kelps have their abundant availability in the aquatic system have the potential to become excellent sources of bio active compounds and nutrients for plant growth. The reason is that consumers are increasingly interested in the possible benefits of functional foods, since this trend is in relation to nutritional genomics (nutrigenomics and nutrigenetics) of functional foods and aims to utilize their health promoting or disease preventing properties. Brown kelps form an integral part of marine coastal ecosystems. They include the macroscopic, multicellular marine algae that commonly inhabit the coastal regions of the world's oceans where suitable substrata exist. Brown kelps are the second most abundant group comprising about 2,000 species which reach their maximum biomass levels on the rocky shores of the temperate zones. They are the type most commonly used in agriculture. The benefits of brown kelps as sources of organic matter and fertilizer nutrients have led to their use as soil conditioners for to increase plant growth and yield. Numerous studies have revealed a wide range of beneficial effects of brown kelp extract applications on plants, such as early seed germination and establishment, improved crop performance and yield, elevated resistance to biotic and abiotic stress, and enhanced postharvest shelf-life of perishable products.

2. USE OF BIO STIMULANTS IN AGRICULTURE

Bio-stimulants are the organically derived stimulants that fosters the plant growth in a demonstrated way throughout the crop lifecycle from seed germination to plant maturity. These can be applied to different parts of plant either seed, soil or other growing media the idea behind that the plant can assimilate and utilize the nutrients for its proper growth and development. Other names for Bio-stimulants include plant strengtheners and conditioners, Phyto stimulants, bio activators and soil, yield, crop and plant growth enhancers. Numerous researches showed benefits of Brown kelps application on plants, such as early seed germination, improved yield, and elevated resistance to biotic as well as abiotic stress and enhanced post-harvest shelf life.

Agricultural bio stimulants include diverse formulations primarily manufactured from in-organic compounds termed as plant growth regulators, often also formulated from organic compounds or micro-organisms. These are used either on plants or soils to improve crop vigor, yields, quality and relieve from stresses situation.

Bio stimulants foster plant growth and development throughout the crop life cycle from seed germination to plant maturity in a number of demonstrated ways, including but not limited to:

- ≈ Improving the efficiency of the plant's metabolism to induce yield increases and enhanced crop quality;
- ≈ Increasing plant tolerance to and recovery from abiotic stresses;
- ≈ Facilitating nutrient assimilation, translocation and use;
- ≈ Enhancing quality attributes of produce, including sugar content, color, fruit seeding, etc.;
- ≈ Rendering water use more efficient;
- ≈ Enhancing soil fertility, particularly by fostering the development of complementary soil micro-organisms.

CONCEPT OF CROP NUTRACEUTICAL™

Global package and practices in agricultural have been evolving and moving towards semi-organic to organic practices for a sustainable or environmental friendly opportunities. Modern agriculture is aiming towards reduction in use of chemical inputs without reducing the yield and quality of Crops.

There are various ways and means to achieve such goals, viz improved breeding programs, tissue culture, biotechnology so on and so forth. But all such processes either time consuming or expensive processes.

But considering the facts of global agriculture economy and the developing countries having real limitation of the investment capacities by the farming communities towards expensive inputs, they rather look for innovative practices.

The identification of vegetable origin foliar nutraceutical support are facilitated through brown kelp natural extracts contain a wide range of natural bioactive compounds. These molecules are able to activate plant metabolism, nutrient assimilation process & nutrient use efficiency that allow significant improvement in crop yield performance in a short period of time and in an economic way further to the advantages by enhancing tolerance to biotic and abiotic stresses.

In this article, future prospects of vegetable origin foliar nutraceutical support are discussed with a focus and particular attention to **Crop Nutraceuticals™** of vegetable origin for intensive agricultural systems such as fruits & vegetable crops.

In fruits and vegetables the use of brown kelp natural extracts application leads to reduction in fertilizers usage without affecting yield and quality, which otherwise lose or deplete or leach out from the root zone during the growing season. Moreover in leafy vegetables, brown kelp natural extracts enhance primary and secondary root growths, leaf pigments viz. Chlorophyll and carotenoids also increasing the antioxidant potential of plants to reduce senescence for prolonged yield in multi-picking crop.

2.1 Modes of Action of Growth Stimulatory Factors in Brown kelp Extracts

Bio-stimulators are materials that promote growth of the plant, but different with fertilizers owing to their activity they are also referred as "metabolic enhancers". Brown kelps contains those components naturally found in plant like plant hormones, nutrients, vitamins, cytokinins affects cellular metabolism leading to enhanced growth and crop yield.

Fig.2.1 Schematic representation of physiological effects elicited by brown kelp extracts and possible mechanism of bioactivity.

2.2 Chemical Components of Brown kelp that Affect Plant Growth

The Brown kelps particularly the Brown and Red Algae are the source of unusual and complex polysaccharides which are not usually found in land Plants.

2.3 Effect on Soil Health, Soil Structure and Moisture Retention

Besides enhancing the growth factors in plants, it improves the Physical, Chemical and biological properties of the soil this turns again to be the promising factor for growth of plants, because a good quality and moisture retaining soil always gives good yield. This brown kelps improves the moisture retaining capacity of the soil and promoting the growth of useful soil microbes. As found, these consist of polyuronides, salts of alginic acid forms a high molecular weight complex with the metallic ions in soil these complexes absorb moisture, swell, retain moisture and improve crumb structure. This results in better soil aeration and capillary activity of soil pores which in turn stimulate the growth of the plant root system as well as boost soil microbial activity.

2.4 Effect on Plant Growth and Health, Root Development and Mineral Absorption

Brown kelp products promote root growth and development. The root-growth stimulatory effect was more pronounced when extracts were applied at an early growth stage in maize, and the response was similar to that of auxin, an important root growth-promoting hormone.

2.5 Effect on Shoot Growth and Photosynthesis

The Brown Kelp on application to plants part at the early stage enhances the content of Chlorophyll to its shoot parts as the content of chlorophyll increases gives larger leaf size, increased rate of photosynthesis and thus better yield.

2.6 Resistance to Environmental Stresses

Abiotic stresses such as drought, salinity, and temperature extremes can reduce the yield of major crops and limit agricultural production worldwide

3. RESULTS AND FINDINGS

3.1. Brown kelp natural extracts for crop enhancement and EliQzer

Brown Kelp natural extracts are natural crop enhancer contain marine bioactive substances extracted used in Agriculture input industry as a raw material having nutraceutical advantages that energize the vital plant physiological process used for therapeutic applications. Marine algal species are often regarded as an underutilized bio resource, many have been used as a source of food, industrial raw

materials, and in therapeutic and botanical applications for centuries. Moreover, brown kelp natural extracts derived products have been widely used as amendments in crop production systems due to the presence of a number of natural stimulating compounds.

Brown kelp Extract is a whole food supplement extracted from the brown kelp. It is ecologically harvested in the remote, pristine ocean waters of Patagonia and the extraction process utilizing a highly specialized cold temperature extraction process, Heat, alters the natural structure of numerous bioactive compounds. The brown kelp cell walls when burst allows the release of the main bioactive compounds into the 100% soluble liquid extract Marine algal species are often regarded as an underutilized bio resource, many have been used as a source of food, industrial raw materials, and in therapeutic and botanical applications for centuries. Moreover, brown kelp natural extracts derived products have been widely used as amendments in crop production systems due to the presence of a number of natural stimulating compounds. All the natural key compounds of the fresh brown kelp beneficial to plants and grasses

Out of the various Bio stimulant PGR products available in the market. One such Product which has been extensively tested by **Parijat Industries (India) Pvt. Ltd. is EliQzer**. The product would be introduced both overseas and domestic market in multiple brand. The **brand EliQzer** to represent overseas market whereas the **brand Fuzico** would show its presence in the domestic retail market.

EliQzer is a unique **Crop Nutraceutical™** management product, biologically derived from broad group of multicellular marine Brown Kelp of class Phaeophyceae harvested from Northern hemisphere is an ecofriendly biological storehouse, manufactured under controlled scientific conditions. EliQzer influence as a significant crop enhancer, to unleash optimum output, better assimilation, maximum utilization of soil nutrients and the best stress buster for the crop.

It contains naturally occurring compounds which helps in Quick & Healthy Germination, Immunization and help withstand Stress & pest attack. It increases soil microbial activities and leads to the development of healthy roots with increased root mass. It also increases Cell division & Cell elongation. The results are also suggestive of increased Leaf Index area & Chlorophyll level. EliQzer also reduces senescence and Checks flower & fruit abscission. It Increases flower production and qualitative & quantitative yield along with enhanced shelf life. The Brown kelp algae extraction done by cold extraction process. It applied in liquid state by dissolving in water and sprayed to the Plants cavity. For better result it was much preferable to act it on plants at the vegetative stage. It can be applied on all types of fruits and vegetables as reported by our scientific experts. On applying to various fruits and vegetables some observed phenomenon was reported. The product reported is found acting in the way, Natural compounds such as pigments, vitamins, hormones, amino acids are sensitive to heat so in order to keep Algae Green as active as possible, keeping processing temperatures low during the extraction process is crucial in order to produce an active brown kelp extract. Brown kelp Liquid is the result of OGT's efforts to preserve as much as possible all the key compounds of brown kelp intact and hence benefit directly to the turf and its health.

3.2 Product Review

The Product significantly increased the bunching and Yield in Grapes, Capsicum, Beans and Brinjal which are very important Crop from commercial point of view.

The Product significantly increased the bunching and yield in crops, which is sprayed on the plant cavity and the result is observed in 6-7 days. Observed result seen are reported here in the image which showed a better quality and size of the crops as below.

Fig. 3. 2. 1 Images of Grapes treated and control treatment

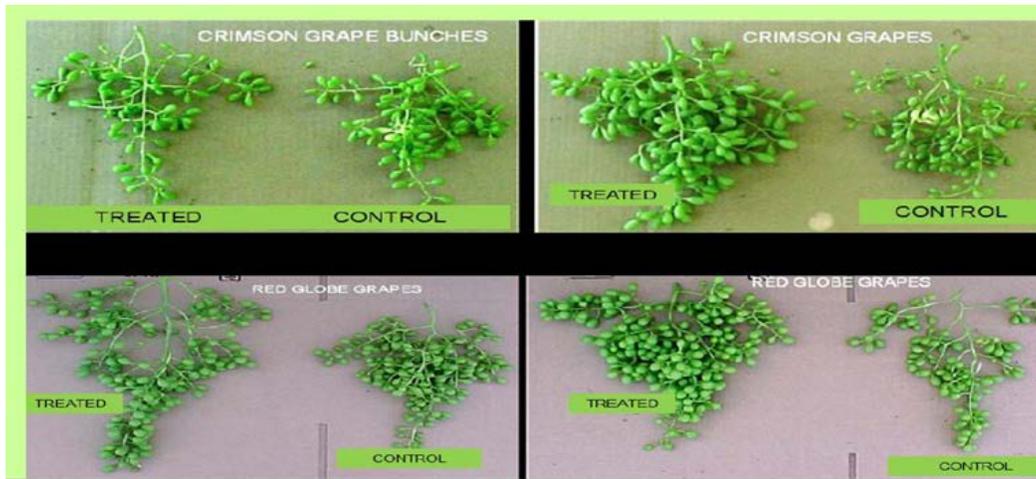


Fig. 3. 2. 2 Images of Capsicum treated and control treatment

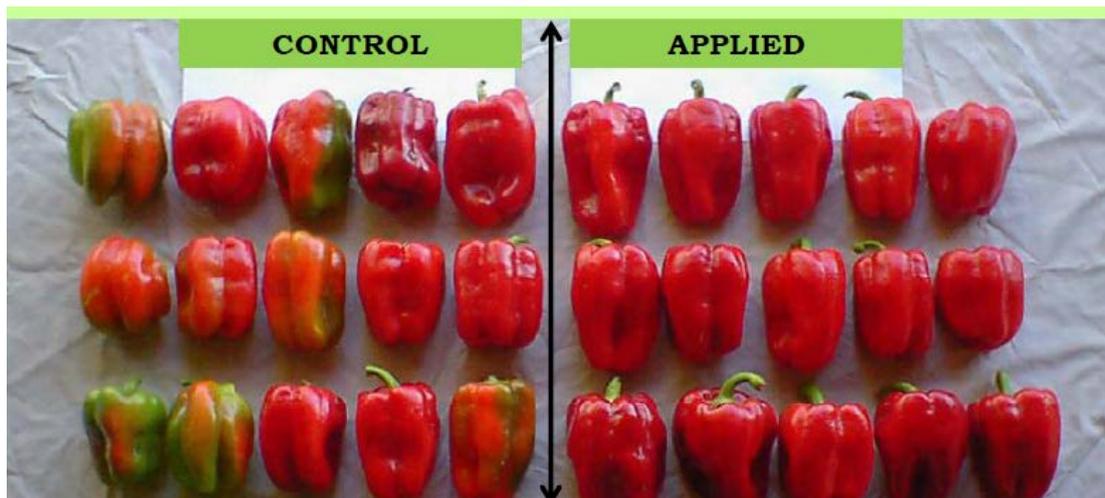


Fig. 3. 2. 3 Images of Beans treated and control treatment under water stress



Fig. 3. 2. 4 Images of Brinjal treated and control treatment



Brinjal Treatment: The product comes with a very simple usage practice. The dose of application is 250 ml/Acre. It can be applied to all crops including vegetables and cereals.

SUGGESTED OBSERVATION PARAMETERS FOR VEGETABLE AND CEREAL CROPS

Vegetables		
S.No.	Particulars	Details
1	Seedling establishment	Plant height, Root Length, Chlorophyll content , General Plant Vigor
2	Flowering	Number of flowers per cluster, Number of flower clusters per plant
3	Fruiting	Number of fruits, Weight of fruit, Even texture and size
4	Yield	Yield in Treated Vs Control
Cereals		
S.No.	Particulars	Details
1	Early establishment phase	Plant height, Root Length, Chlorophyll content , General Plant Vigor
2	CRI/Critical stage	Development of Plant in Critical stage
3	Tillering	No. of tillers/per Plant, Girth etc
4	Panicle initiation	Panicle initiation early in treated, Panicles per Plant , Time taken for maturation

4. CONCLUSION

EliQzer has been adequately been tested in wide ranges at multi location under various environment. It has proved its worth and versatility. This molecule formulation has been developed on the need of Crop Nutraceutical™ under the present agricultural management where both open rainfed and non rainfed agriculture suffer climatic **vagaries** and multiple stress scenario. Hence in the recent time there is a vibrant paradigm shift towards Crop Nutraceutical™ concept from fundamental usage of plant growth regulator based bio stimulants as well as other crop care products which are normally catered in the Indian Market.

To feed the growing population Crop Nutraceuticals™ and bio stimulant would play a key role in agriculture for now and future population growing and to Bio stimulants are definitely the future in Agriculture as the choice are wider . However having a Crop

Nutraceuticals™ product like *EliQzer* in hand, every farmer will be able to attain the increase yield potential. Thus *EliQzer* surely is an evergreen essence for a splendid harvest.

REFERENCES

- [1] G.Blunden;T.Jenkins,Y.Liu, “Enhanced leaf chlorophyll level in plants treated with seaweed extract”, Journal of applied Phycology,1997,pp-535-543.
- [2] Hong, D.D., Hien, H.M., Son, P.N. Seaweed from Vietnam used for functional food, medicine and biofertilizer. Journal of Applied Phycology,2007,19:817 – 826.
- [3] Adams-Phillips, L., Barry, C., Giovanni, Signal transduction systems regulating fruit ripening Trends Plant Science, 9:331-338.
- [4] Truck, F., Fonfara, F., Coupland, G. Regulation and identity of florigen: Flowering locus T moves center stage, Annual Review of Plant Biology, 59:573-594.

Authors

First Author – Mr. Keshav Anand, email address: keshav.anand@parijat.in

Second Author – Mr. Uday Anand, email address: uday.anand@parijat.in

Third Author – Mr. Shivraj Anand, email address: shivraj.anand@parijat.in

Fourth Author- Mr. Sandeep Datta, email address: sandeep.d@parijat.in

Fifth Author- Dr. Mona Joshi, email address: mona.j@parijat.in

Sixth Author-Miss Nidhi Kumari, email address: nidhi.k@parijat.in

Seventh Author- Mr. Durgesh Kumar Chaudhary, email address: durgesh.c@parijat.in

Correspondence Author – Mr. Durgesh Kumar Chaudhary, email address: durgesh.c@parijat.in , contact number: 9643314740