



EKLO-GROW(R)  
ECKLONIA KELP PLANT GROWTH STIMULANT - 'EKB'

This Guide Manual consists of the following:

- Product Description
- List of Plant Growth Biostimulants in EKB
- Recommended Application Rates
- Notes on Toxicity
- Product Specifications
- List of Scientific Publications on EKB

Product Description:

- Eklo-grow(r) is a non - toxic natural product manufactured from Ecklonia maxima, an edible species of brown kelp seaweed.
- The mechanical manufacturing process shears & ruptures the cells of freshly harvested Ecklonia kelp, releasing the contents of the cells and concentrating it into a pure seaweed concentrated liquid cytoplasm .
- The cell walls are then filtered off and organic preservatives are added.
- The resulting product is completely non - toxic to humans, animals, birds and insects and is neither flammable nor explosive.
- The product is bio-degradable and is beneficial to soil, plants and animals.
- Numerous scientific studies confirms Eklo-grow(r) efficacy to stimulate root development, improve plant growth and increase yields.

PRODUCT SPECIFICATION

PRODUCT NAME	: Eklo-grow(r)
CLASSIFICATION	: Plant Growth Stimulant
FORMULATION	: Liquid concentrated cytoplasm from freshly harvested kelp, Ecklonia maxima. The mechanical manufacturing technique results in cellular shearing & rupturing, obviating the use of chemicals, heat, freezing or dehydration to ensure extended natural hormonal activity.

ACTIVE INGREDIENTS	: Natural Auxins 11 mg / litre indole-3-acetic acid indole-3-carboxylic acid indole-3-aldehyde N,N-dimethyltryptamine N-hydroxyethylphalimide
	: Natural Cytokinins 0.03 mg / liter trans-zeatin cis-zeatin trans-ri bosyizeatin dihydrozeatin isopentenyladenosine isopentenyladenine
OTHER INGREDIENTS	: Organic Preservative System – 0.05%
APPEARANCE	: Light brown aqueous liquid.
PHYSICAL STATE	: Liquid
SPECIFIC GRAVITY	: 1.03
pH	: 4.6
MOISTURE CONTENT	: 99.9%
BOILING POINT	: 100°
STORAGE	: Should be stored out of direct sunlight, and preferably in a cool area.
SHELF LIFE	: 3 Years
HAZARD RATING	: Extremely low - Eklo-grow(r) is regarded as non-toxic and is non-hazardous to users and the environment.
MEDICAL & FIRST AID	: The product is non-toxic. Rinse with cold water if slight eye irritation is experienced,.
CONTAINER DISPOSAL	: No special precautions as product is non-toxic.

#### Eklo-grow(r) APPLICATION CHART

CROP	RATE	TIMING
Apples	1:500 dilution	To reduce burn caused by calcium sprays (Calcium nitrate or Calcium chloride) applied for control of bitter pit. Apply EKB in tank mix with calcium sprays.

Cereals	1 Qt/Acre	Dryland: Spray once between 2- and 6- leaf stage (Irrigation: Spray 2 Qt/Acre) Optional 2nd spray 3 to 6 weeks later
Dry Beans	1 Qt/Acre	Spray at 3rd trifoliate stage Repeat the application twice at intervals of 14 days
Flowering and Ornamental Plants	1 ml per plant  1: 500 dilution	Dilute in approximately 100 ml water and soak the soil around the seedling shortly after planting out Spray 1 to 2 weeks after emergence or plant-out. Repeat 2 to 3 times with approximately 3 to 4 week intervals
Groundnuts (Peanuts)	1 Qt/Acre	Spray once at 2 - 3 weeks after germination Repeat 3 - 4 weeks later
Lucerne (Alfalfa)	1 Qt/Acre	Spray once, 3 to 5 days after each cut or grazing
Lupins	1 Qt/Acre	Spray once, 2 to 7 weeks after emergence
Maize	1 Qt/Acre	Spray plant rows once between 3- and 5- leaf stage (Use 3 L/ha if sprayed at a later stage)
Oilseed Rape	1 Qt/Acre	Spray as soon as Spring growth is evident
Onions	1: 150 solution and 1 Qt/Acre	Dip transplants (bottom third, including roots) immediately before transplanting. Spray 14 - 21 days later. Repeat the application twice at 14 -21 day intervals.
Other field crops	1 Qt/Acre	Spray 1 to 2 weeks after emergence. Repeat 2 to 3 times with approximately 3 - 4 week intervals.

Eklo-grow(r) APPLICATION CHART CONT:

Pastures	1 Qt/Acre	Spray during early growth after grazing or cutting
Potatoes	200ml/100l water 2 Qt/Acre 1 Qt/Acre	Dip the seed potatoes for approximately 5 minutes plus Spray 28 days after emergence, plus spray 10 - 14 days later
Tomatoes	1 ml/plant  1 Qt/Acre	Dilute in 250 ml water and apply to soil around plant at or just after transplanting. Spray 14 days later. Repeat the application twice at 14 day intervals.
Rice	1: 500 Dilution 1 ml per m <sup>2</sup>  1: 500 Dilution  1 Qt/Acre	Dip seeds in the solution before sowing, or Apply to seedling bed at a dilution of 1:500. Best results are obtained when applied 3 days before transplanting, or dip seedlings for 1-2 seconds before transplanting, plus after one of the above treatments, Spray 20-35 days after transplanting
Soya Beans	2 Qt/Acre 1 Qt/Acre	Spray at 3rd trifoliate leaf stage Spray 10 - 14 days later
Sugar Beet	2 Qt/Acre	Spray once at 4- to 8- leaf stage
Sugar Cane	1 Qt/Acre 1 Qt/Acre	At planting: Spray around sett while planting, plus spray 2-3 weeks after emergence; repeat after 3 weeks

Vegetables	1 ml per plant  OR 0,5% solution  1 Qt/Acre	Dilute in approximately 100 ml water and soak the soil around the plant stem shortly after plant out, /or Dip seedlings ( Dip seedlings, bottom third including roots ) immediately before transplanting and Spray 1-2 weeks after transplanting. Repeat 2 to 3 times at approximately 3 - 4 week intervals.
Vines, Citrus, Fruit Trees	Planting out: 3 ml/plant Established Trees: 1: 500 Dilution	Dilute in 1 to 2 litres water and soak the soil around the plant stem shortly after planting out Spray 3 to 4 times during early active growth at 15 day intervals. Repeat twice as post-harvest sprays.

## NOTES ON TOXICOLOGY

Summary as follows:

ACUTE ORAL LD50 ( MALE RATS )	> 5600 mg/kg - Non - toxic
ACUTE DERMAL	> 8600 mg/kg - Non - toxic
EYE IRRITATION	Non - irritant for corneal opacity, iris lesion, conjunctival redness, and conjunctival oedema. ( 72 Hours )
SKIN IRRITATION	Non - irritant -all scoring intervals (72 hrs)

\* Should you require additional information, please forward your request to the following E - mail address : [info@CambrianProducts.com](mailto:info@CambrianProducts.com)

## SCIENTIFIC PUBLICATIONS published on Eklo-Grow(r)

### Theses

1. **"CYTOKININS IN ECKLONIA MAXIMA AND THE EFFECT OF SEAWEED CONCENTRATE ON PLANT GROWTH"**  
A Doctoral Theses by B.C. Featonby-Smith
2. **"THE EFFECT OF SEAWEED CONCENTRATE ON PLANT GROWTH"**  
A Doctoral Thesis by I.J. Crouch
3. **"THE EFFECT OF SEAWEED CONCENTRATE ON SEED GERMINATION AND SEEDLING ESTABLISHMENT"**A Thesis for the degree of Master of Science by M.J. Rijkenberg

### Publications on Active Ingredients:

1. **Tentative identification of the cytokinins present in Ecklonia maxima.**  
B.O. Featonby-Smith. Extract from a PhD Thesis entitled "Cytokinins in Ecklonia maxima and the effect of seaweed concentrate on plant growth."  
p.42-53 (1984)

2. **Evidence for rooting factors in a seaweed concentrate prepared from *Ecklonia maxima*** . I.J. Crouch and J. van Staden. Journal of Plant Physiology. Vol 137, p.319-322 (1991)
3. **Identification of Auxins in a commercial seaweed extract.**  
I.J. Crouch, M.T. Smith, J. van Staden, M.J. Lewis and G.V. Hoad. Journal of Plant Physiology. Vol 139, p.590-594 (1992)
4. **1-Aminocyclopropane-i-carboxylic acid in a seaweed concentrate.**  
W.R. Nelson and J. van Staden. Botanica Marina. Vol 28 p.415-417 (1985)

In Vitro Culture:

5. **The effect of seaweed concentrate and applied hormones on in vitro cultured tomato roots.** J.F. Finnie and J. van Staden. Journal of Plant Physiology. Vol 120 p.215-222 (1985)
6. **The effect of seaweed concentrate on the growth of Potatoes in vitro.**  
I.J. Crouch and J. van Staden. South African Journal of Science. Vol 87 p.275-276 (1991)

Seed Treatment:

7. **Dormancy control in *Pinus patula* seed.**  
D.G.M. Donald. South African Forestry Journal. Vol 118 p.14-19 (1981)
8. **Studies on the viability of *Paulownia* seed.**  
by D.G.M. Donald. Published in "Proceedings of the International Symposium on Forest Seed Problems in Africa". Harare, Zimbabwe. Aug - Sept (1987)

Seedlings:

9. **The effect of seaweed concentrate on seedling transplants.**  
S.J. Aldworth and J. van Staden. South African Journal of Botany. Vol 53(3) p.187-189 (1987)
10. **The effect of seaweed concentrate on the growth of *Pinus pinea* seedlings.** N. Atzmon and J. van Staden. New Forests. Vol 8 p.279-288 (1994)
11. **Effect of seaweed concentrate on the growth of the seedlings of three species of *Eucalyptus*.** J. van Staden, R.P. Beckeff and M.d. Rijkenberg. South African Journal of Botany. Vol 61(4) p.169-172 (1995)

On Crops:

12. **Influence of foliar spraying with seaweed products on the growth and mineral nutrition of rye and cabbage.**  
WAG. Kotze and M. Joubert. Elsenburg Journal. Vol 4 (1) (1980)

13. **The effect of seaweed concentrate on wheat culms.**  
W.R. Nelson and J. van Staden. Journal of Plant Physiology. Vol 115 p.433-437 (1984)
14. **Effect of seaweed concentrate on the growth of wheat under conditions of water stress.** P.A. Mooney and J. van Staden. South African Journal of Science. Vol 81 p.632-633 (1985)
15. **Effect of seaweed concentrate on the growth of wheat.**  
W.R. Nelson and J. van Staden. South African Journal of Science. Vol 82 p.199- 200 (1986)
16. **The effect of seaweed concentrate on the growth and yield of Potassium stressed wheat.** R.P. BeckeR and J. van Staden. Plant and Soil. Vol 116 pg. 29-36 (1989)
17. **The effect of seaweed concentrate on the yield of nutrient stressed wheat.** R.P. BeckeR and J. van Staden. Botanica Marina. Vol 33 p.147-152 (1990)
18. **The effect of seaweed concentrate on the yield of salinity stressed wheat.** R.P. BeckeR and J. van Staden. Acta Physiologiae Plantarum. Vol 13 (2) p.87-90 (1991)
19. **Effects of seaweed concentrate on grain yield in barley.**  
B.C. Featonby-Smith and J. van Staden. S.A Journal of Botany. Vol 53(2) p.125 - 128 (1987).
20. **Combined use of a selective herbicide and seaweed concentrate.**  
D.J. Erasmus, W.R. Nelson and J.van Staden. SA Journal of Science. Vol 78 p423-424 (1982)
21. **The effect of spraying a seaweed product on dry mass of young maize plants.** W. du Toit and A.L.P. Cairns. Presented at the Congress on Crop Production, South Africa (1984)
22. **The effect of seaweed concentrate and fertiliser on growth and the endogenous cytokinin content of Phaseolus vulgaris.**  
B.C. Featonby-Smith and J. van Staden. S.A Journal of Botany. Vol.3 p.375-379 (1984)
23. **Effects of Kelp (Macrocystis integdfolla and Ecklonia maxima) foliar applications on bean crop growth.** W.D. Temple and A.A. Bomke. Plant and Soil. Vol.117 p.85 - 92 (1989)
24. **Effects of Kelp (Macrocystis integritolia and Ecklonia maxima) foliar applications on bean growth and nitrogen nutrition under varying soil moisture regimes.** W.D. Temple, A.A. Bomke, R.A. Radley and F.B.Holl. Plant and Soil. Vol.117 p 75-83 (1989)

25. **Effect of seaweed concentrate on yield of nutrient-stressed tepary bean (*Phaseolus acutifolius* Gray)** R.P. Becker, A.D.M. Mathegka and J. van Staden *Journal of Applied Phycology*. Vol 6 p.429-430 (1994)
26. **Effect of seaweed concentrate on the establishment and yield of greenhouse tomato plants.** I.J. Crouch and J. van Staden. *Journal of Applied Phycology*. Vol 4 p.291-296 (1992)
27. **The effect of seaweed concentrate on growth of nutrient-stressed greenhouse cucumbers.**  
W.R. Nelson and J. van Staden. *Horticultural Science*. Vol 19 (1) p.81-82 (1984)
28. **The effect of seaweed concentrate and fertiliser on the growth of *Beta vulgaris*.**  
B.C. Featonby-Smith and J. van Staden.  
*Zeitschrift für Pflanzenphysiologie*. Vol 112 (2) p.155-162 (1983)
29. **Effect of seaweed concentrate on the growth and mineral nutrition of Nutrient - stressed lettuce.** I.J. Crouch, R.P. Becken and J. van Staden. *Journal of Applied Phycology*. Vol.2 p.269-272 (1990)
30. **Effect of seaweed concentrate on yield and seed quality of *Arachis hypogaea*.** B.C. Featonby-Smith and J. van Staden. *S.A Journal of Botany*. Vol.53(3) p.190 - 193 (1987)
31. **Effect of seaweed concentrate on growth and development of the marigold *Tagetes patula*.** J. van Staden, S.d. Upfold and F.E. Drewes. *Journal of Applied Phycology*. Vol.6 p.427-428 (1994)

Effect on Nematodes:

32. **The effect of seaweed concentrate on growth of tomato plants in nematode- infested soil.** B.C. Featonby-Smith and J. van Staden. *Scientia Horticulturae*. Vol.20p.137- 146 (1983)
33. **Effect of seaweed concentrate from *Ecklonia maxima* (Osbeck) Papenfuss on *Meloidogyne incognita* infestation on tomato.**  
I.J. Crouch and J. van Staden. *Journal of Applied Phycology*. Vol 5 p.37-43 (1993)
34. **Influence of seaweed concentrate on the reproduction *Pratylenchus zae* (Nematoda) on maize.**  
O. de Waele, A.H. MacDonald and E. de Waele. *Nematologica*. Vol 34 p.71-77 (1988)
35. **Response of the potato cyst nematode and potato to applications of seaweed concentrate.**  
C. Fleming, B. Herben. *Proc. Of Crop Protection in Northern Britain* (1996)

