



Kelp Agri Products
 ABN: 14 147 661 603
 PO Box 175
 (58 Herbert Street)
 ALLORA QLD 4362

Phone: 0429 126 102
Fax: 07 4666 3296
Website: kelpagriproducts.com.au

SEAWEED SENSATION (*SeaSens*) – WHY USE LIQUID SEAWEED?

SeaSens contains natural plant growth hormones (cytokinins and auxins) and a large number of minerals and micro-nutrients ... but more importantly, it also combines these hormones and minerals with vitamins, amino acids and natural chelating agents.

What do cytokinins do? Cytokinins improve soil tilth (a combined assessment/measure of particle size, moisture content, degree of aeration, rate of water infiltration and drainage), regulate plant cell division and cell wall formation, increase the effectiveness of the photosynthesis process and chlorophyll production, improve root and shoot growth and extend the productive plant seasonal life by delaying senescence in autumn (the plant preparation process for winter – dropping leaves, losing colour etc).

What do auxins do? Auxins regulate cell length or cell elongation and stimulate root development and fruit development/production. It is the hormones in *SeaSens* that have the most impact on how your plants/crops will grow and reproduce.

SeaSens is produced by using a natural fermentation process which liquefies the dried kelp and maximises the high nutrient levels in a form which is able to be utilised by both plants and soil. And this use is not restricted to agriculture – it is equally applicable for horticulture and domestic situations as well as broadacre application. Numerous research trials (see Other Information page for links) have proven that liquid seaweed compounds will successfully:

- increase nutrient uptake
- strengthen root development
- strengthen stem growth
- increase photosynthesis
- increase yield/production
- increase the shelf life of the produce
- improve the quality of the produce

So what are the overall benefits?

In summary, *SeaSens* will:

- redress deficiencies because it is a natural soil conditioner with a wide range of micronutrients
- condition your soil
- assist plants to absorb the increased range of nutrients
- stimulate root growth through the presence of auxins
- increase yield and decrease time taken for produce to reach maturity
- improve quality of product
- increase resilience against weather-induced stress from too much or too little rain
- improve product storage times by increasing plant resistance to bacterial and fungal issues which can lead to product deterioration and short storage times



Why Use “SeaSens”?

- improve the nutritional value of the crops and produce – seaweed conditioners include selenium and iodine which, when applied to the plant and soil, will increase the presence of these minerals in the produce
- stimulate the activity of microscopic and other fungi in your soil which in turn, increases the availability and usability of the soil nutrients to the plants
- improve the sweetness of the produce – cytokines are a natural hormone found in seaweed which increases the sugar level in plants, resulting in more robust growth and sweeter fruit
- assist seed germination – because seaweed retains its micronutrients, amino acids and plant growth hormones, seed germination and disease resistance is improved
- reduce the negative effect of transplanting seedlings
- improves the success rate of establishing cuttings (through the auxins present)
- reduce the problem of fruit-drop – the cytokines help reduce the aborting of immature fruit and stimulates earlier flowering
- reduce the impact of nematodes – seaweed reduces the breeding opportunities for nematodes (eelworms) so helps reduce their numbers which then reduces their propensity to invade plants – the natural antibiotics contained in seaweed also helps reduce nematode populations
- improve the resilience to frost damage – seaweed strengthens the cell walls of the plant which helps reduce the impact of both frost and extreme heat

So what is the dollar outlay?

Well ... that’s where the news is even better. The following is a comparative table for *SeaSens* against two of the market-leader equivalent products. These prices were correct as at October 2013.

Product	Price per 20 litre drum <small>** converted from 25 to 20 litres for comparison purposes</small>	Cost per hectare based on application rate of 3 litres per hectare	Percentage EXTRA costs when other than <i>SeaSens</i> is used
Seasol	\$209.90	\$31.48	68%
Natrakelp	**\$220.00	\$33.00	76%
Seaweed Sensation (SeaSens) (1 x 20 ltrs)	\$125.00 – including GST	\$18.75	
Seaweed Sensation (SeaSens) (5 x 20 ltrs)	\$100.00 – including GST when purchased as 5 x 20 drums (100 litre bundle)	\$15.00	Discount for bulk purchase – 20%

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SEAWEED SENSATION (*SeaSens*) APPLICATION GUIDELINES

Generally, *SeaSens* should be applied at a rate of 3 – 5 litres per hectare in a minimum of 250 litres per hectare of water – this equates to mixes between approximately 1:50 and 1:85. The higher concentration is recommended for situations where resilience to frost and extreme heat needs to be increased.

Therefore, as a guide, one 20 litre container of *SeaSens* will make up to between 1000 and 1650 litres of mixture. At 3 litres per hectare, one 20 litre container will cover approximately seven hectares whilst at 5 litres per hectare, one 20 container will cover approximately four hectares.

Each one kilogram of kelp powder used in the *SeaSens* concentrate is dried from five kilograms of harvested kelp.

Specific Target Crop/Pasture	Mix Rate per 250 litres of water per hectare	Recommended Usage/Timing
Pasture	3 - 5 litres/ha	Every three months or immediately after each grazing rotation, immediately after sowing new seed or within two weeks of season break – it is safe to double application rates to take advantage of seasonal flushes or immediately after cutting for hay
Turf	3 litres/ha	Every two months or immediately after each harvest or immediately after sowing new seed or within two weeks of season break
Vegetables generally	4 litres/ha	Spray at two to four leaf stage, at pre-flowering and two/three weeks later
Broccoli, brussell sprouts, cauliflower, cabbage, lettuce	4 litres/ha	Spray at four leaf stage and prior to heart formation
Melons	6 litres/ha	Spray at first leaf flush, pre-flower and pre-fruit set
Beans and peas	4 litres/ha	Spray before flowering and every four weeks until end of flowering
Citrus	4 litres/ha	Spray at planting or new flush, before flowering and two weeks later
Stonefruit	4 litres/ha	Spray at bud burst, shuck fall and five weeks later



Application Guidelines

Specific Target Crop/Pasture	Mix Rate per 250 litres of water per hectare	Recommended Usage/Timing
Nuts	4 litres/ha – medium 8 litres/ha – large	Soak soil prior to planting seedlings For mature plants, spray early in the growing season and at early fruit set
Cucumbers, squash, eggplant, carrots	4 litres/ha	Spray when plants have sufficient leaf to target, at full flower and again two weeks later
Onions	6 litres/ha	Spray at 5 cm in height and prior to stem swell
Potatoes, sweet potatoes	4 litres/ha	Dip seed potatoes for five minutes before planting, spray three weeks after emerging and again two weeks later
Strawberries, blueberries etc	2 litres/ha	Soak runner roots before transplanting and then spray every four weeks until the end of flowering
Tomatoes, capsicum and chillies	6 litres/ha	Soak seedlings before transplanting and spray prior to first flowering and every three weeks to end of flowering
Cotton	5 litres/ha	Spray two weeks after emergence and two and four weeks later
Canola, cereals, corn/maize	6 litres/ha	Spray once between the four- and six-leaf stage
Lucerne/clover	6 litres/ha	Spray three weeks after emergence and repeat after each grazing/cut
Soya beans	4 litres/ha	Spray at third trifoliolate leaf stage and again two weeks later
Sugar cane – new	4 litres/ha	Dip the stalks of the new plantings or spray stalks in furrows before covering, then two to three weeks after emergence and again at two and four weeks intervals
Sugar cane – established	3 litres/ha	Spray at flowering and again at two and four week intervals
Grapes	4 litres/ha	Spray after full bloom and repeat every two weeks
Ornamental plants	20 ml per litre	Spray at bud formation and again every two weeks
Potted plants or seedling establishment	20 ml per litre	Water trays or pots in spring and repeat every three weeks

The suggested rates and dosages listed above are approximate only. These may be varied dependent upon the regional location, soil type and fertility. Where appropriate, additional applications can be made prior to or following unusual stress periods, including frost, drought, excess rain or extreme heat/cold. Increasing the frequency of applications is recommended rather than increasing the amount of concentrate used in the application. As the crop or pasture matures, higher concentrations can be used. Generally, optimum timing of spraying co-incides with natural plant cycles – when watering in seedlings, on early plant growth, growth spurts in mature plants, pre-fruit set and at fruit set.





Application Guidelines

SeaSens is able to be used in conjunction with most fungicides, fertilisers and insecticides. It is not compatible with acidic or acid-based products. Should the interaction of any chemical be unknown, it is recommended that the compatibility be tested under controlled conditions in a jar prior to mixing in a tank.

SeaSens has very good longevity (approximately two years) when stored correctly, preferably in a cool, dry area out of direct sunlight. It will store safely down to five degrees, below which crystallisation or sedimentation may occur.

Directions for Use

Shake or stir the concentrate before use, particularly when the container is near empty – this will dissolve the residue on the bottom of the container. It is recommended that the concentrate be added to a half-full spraying receptacle and then topped up to help ensure a thorough mixing process. The mix should be agitated during application to ensure thorough mixing and avoid any separation or settlement of concentrate.

Do not pre-mix or store in diluted form and, once opened, use the concentrate promptly.

Sprays for foliage (foliar sprays) are more effective when applied either early in the morning or late afternoon.

Avoid spraying when target plants are close to harvest to ensure that no staining occurs to the fruit/vegetable or crop.

Avoid spillages on floors if at all possible, but should any occur, they should be cleaned up immediately – the product becomes very slippery when mixed and may create an operational hazard.

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SeaSens mixing rates and costing information

SeaSens Mix rates

3 litres per hectare	250 litres of water	equates to	1 : 83
4 litres per hectare	250 litres of water	equates to	1 : 62.5
5 litres per hectare	250 litres of water	equates to	1 : 50

Mixed quantities at varying rates per

3 litres per hectare	20 litres of SeaSens	dilutes to	1667 litres of mix
4 litres per hectare	250 litres of water	dilutes to	1250 litres of mix
5 litres per hectare	250 litres of water	dilutes to	1000 litres of mix

Hectares covered per

	20 litres of SeaSens
3 litres per hectare	6.67 hectares
4 litres per hectare	5 hectares
5 litres per hectare	4 hectares

Cost per hectare

	20 litres of SeaSens @ \$ 125 per drum inc GST
3 litres per hectare	\$ 18.75 /hectare
4 litres per hectare	\$ 25.00 /hectare
5 litres per hectare	\$ 31.25 /hectare

Cost per hectare - bulk purchase

	100 litres of SeaSens @ \$ 100 per 20 ltr drum inc GST	when purchased in bulk as 5 x 20 ltr drums
3 litres per hectare	\$ 15.00 /hectare	
4 litres per hectare	\$ 20.00 /hectare	
5 litres per hectare	\$ 25.00 /hectare	

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Typical Analysis of Bull Kelp originating from Tasmania, Australia

Botanical name: *Durvillea Potatorum*

Minerals and Trace Elements

Alginates	600-700 g/kg	Manganese	61.50 ppm
Boron	70 ppm	Nitrogen	0.75%
Calcium	1.40%	Phosphorus	0.15%
Cobalt	12 mg/kg	Potassium	1.20%
Copper	6 mg/kg	Selenium	0.09 ppm
Iodine	0.5 g/kg	Sodium Chloride	3.00%
Iron	0.8 g/kg	Sulphur	0.82%
Magnesium	1.00%	Zinc	30.00 ppm

Vitamins

Vitamin A - Retinol	150 IU/kg	Vitamin C - Ascorbic Acid	10 mg/kg
Vitamin B1 - Thiamine	200 mcg/kg	Vitamin E - Tocopherol	6.4 mg/kg
Vitamin B2 - Riboflavin	2.5 mg/kg	Choline	275 mg/kg
Vitamin B3 - Niacin	23 mg/kg	Carotene	42 mg/kg
Vitamin B6 - Pyridoxene	230 mcg/kg	Pantotene	7 mg/kg

Cytokinins and Auxins (hormones or growth regulators)

Cytokinins - compounds which are manufactured in the root system and responsible for cell division and elongation in plants

Trans Zeatin Riboside (ZR)	7.00 +/- 1.0 micrograms/litre
Isopentenyl Adenosine (IPA)	2.00 +/- 1.0 micrograms/litre
Trans Zeatin (Z)	0.07 +/- 0.3 micrograms/litre
Isopentenyl Adenine	16.00 +/- 1.5 micrograms/litre

Auxins - compounds produced in the root and stem cell division and responsible for promoting root growth and initiating buds

Tri Indole Acetic Acid	150.00 micrograms/litre
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Gibberellins - compounds produced in active leaves and also responsible for cell elongation

Gibberellins along with auxins facilitate cell elongation.

Amino Acid Analysis - Averages

Amino Acid Type	Total % Amino Acid	gm/Amino Acid in 100 gm Crude Protein	gm/Amino Acid in 100 gm Dry Matter	Amino Acid Type	Total % Amino Acid	gm/Amino Acid in 100 gm Crude Protein	gm/Amino Acid in 100 gm Dry Matter
Aspartic acid	0.477	8.658	0.542	Valine	0.206	3.744	0.234
Threonine	0.193	3.494	0.219	Cystine	0.105	1.905	0.119
Serine	0.197	3.577	0.224	Methionine	0.070	1.272	0.080
Glutamic acid	0.498	9.031	0.565	Isoleucine	0.148	2.593	0.162
Proline	0.165	2.991	0.187	Leucine	0.249	4.513	0.283
Glycine	0.203	3.682	0.231	Lysine	0.182	3.301	0.207
Alanine	0.272	4.936	0.309	Arginine	0.132	2.402	0.150
Subtotals	2.005	36.369	2.277	Subtotals	1.087	19.73	1.235
				TOTALS	3.092	56.099	3.512

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Safety Data Sheet - Kelp/Seaweed Products

Kelp Agri Products liquid seaweed products are based on sustainably harvested Tasmanian Bull Kelp (*Durvillaea Potatorum*).

Kelp Agri Products processes the kelp powder into a concentrate which is suitable for use in agricultural, horticultural and residential markets.

Kelp Agri Products liquid concentrates are intended to be diluted with water to a factor of between 1:10 and 1:80.

The diluted product is suitable for application to plants and/or soil. It can also be utilised as a seed coating.

Typical Features/Characteristics

Colour	Tea-like colour, ranging from light to dark brown
Compatibility	Concentrate is acid-stabilised, so will allow the addition of a range of additives - alkaline solutions should not be added Where end users intend to use additives, Kelp Agri Products recommends a precautionary trial in small areas
Corrosion characteristics	Non-corrosive
Explosibility	None
Flammability/flashpoint	None
Hazards	None
Odour	Decomposing seaweed
Oxidising/reducing	None
pH	Ranges from 3.5 to 6.0
Physical form	Viscous liquid
Shelf life	Minimum of two years - conditional upon containers being airtight and stored away from direct sunlight
Solubility	100% through a 120 mesh filter
Storage stability	In warehouse or normal/standard storage conditions in the original container, very stable
Toxicity	Non-toxic and fully biodegradable

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