Acadian Seaplants

Kelp Meal

(100% *Ascophyllum nodosum*)

For Soil Applications

Natural Ingredients From the Cold and Clean North Atlantic Coast of Canada

The Soil Fertility Challenge

Managing the fertility of agricultural soils is a common challenge facing growers throughout the world. In many areas, intensive farming practices have reduced once rich and productive agricultural land into soil with poor physical structure and nutritional deficiencies. Low fertility levels in depleted soils have limited potential for productive and quality crops, yet the causes of such problems are often difficult to diagnose and overcome.

Nurturing healthy soil requires the maintenance of a fine equilibrium between economics, agricultural management practices and the soil's physical, biological and chemical characteristics. Today's successful growers achieve this balance by using naturally balanced soil additives such as *Ascophyllum nodosum* seaweed.

Ascophyllum nodosum seaweed contains a unique combination of naturally chelated plant nutrients and trace elements, carbohydrates, amino acids and other naturally occurring constituents which work together to provide a highly effective soil supplement and conditioner.

Acadian Seaplants *Ascophyllum* Kelp Meal

Commonly known as "Norwegian Kelp" or "Rockweed", *Ascophyllum nodosum* is a unique species of seaweed which grows only on selected shorelines of the North Atlantic. It is particularly abundant along the cold, clean and nutrient-rich waters of the Atlantic Coast of Canada, where Acadian Seaplants Limited, a world leader in seaweed-based products for agriculture, harvests the valuable seaweed and processes it into pure *Ascophyllum nodosum* Kelp Meal.

Trained Acadian Seaplants harvesters hand-rake the marine plants under closely controlled conditions to ensure purity and freshness. Acadian Seaplants dehydrates the fresh *Ascophyllum* using gentle passive solar drying technology which preserves the maximum benefits of the live seaweed, then carefully processes the dehydrated material into granular meals and flours. Stringent Acadian Seaplants quality control standards are enforced from harvesting through to processing, thus ensuring uniform and consistently superior quality Kelp Meal products.

The *Ascophyllum* Kelp Meal Solution

Ascophyllum nodosum seaweed contains a wide range of naturally occuring plant nutrients and trace minerals which are essential to plant growth, health and productivity. The plant nutritional benefits associated with trace minerals are often overlooked as these minerals are required in minute quantities and are difficult to provide in a balanced, readily absorbable form. The naturally occurring trace minerals found in *Ascophyllum nodosum* are naturally chelated. Naturally chelated trace minerals are more readily available for plant uptake than minerals supplied in inorganic form. Mixed into the soil, *Ascophyllum* Kelp Meal acts as a nutritional supplement which releases its nutrients as it breaks down.

The organic composition of marine plants is quite different from land plants. Whereas cellulose is the main organic constituent of land plants, *Ascophyllum nodosum* seaweed is composed primarily of carbohydrates such as alginic acid and mannitol. These simple compounds break down much more readily than cellulose, making Acadian Seaplants *Ascophyllum* Kelp Meal an excellent source of organic matter. Alginic acid and mannitol also act as effective chelating agents for micronutrients, and contribute to building soil structure.

The organic matter and soil conditioning properties in *Ascophyllum* Kelp Meal are important to the fertility and productivity of agricultural soils. Organic matter in the soil, and associated soil microflora, bacteria and fungi, play an important role in soil fertility and plant nutrient uptake. *Ascophyllum* Kelp Meal acts as a soil conditioner by stimulating microbial activity, a process often disrupted by modern agricultural practices. The minerals released and humus colloids formed during the decomposition of *Ascophyllum* Kelp Meal, result in the aggregation of soil particles and the retention of nutrients which might otherwise be leached from the soil. Good soil structure provides improved aeration, water holding capacity and soil fertility, and makes soils less prone to erosion and erosive forces.

Applications

Acadian Seaplants Kelp Meal products are a natural and cost effective enhancement to any soil fertilization and conditioning program. It is available in a wide range of particle sizes suitable for all crops and applications, and can be mixed with most soil conditioners and fertilizers. It can also be incorporated into potting soils, seed and transplant beds, as well as composting materials.

For use on agronomic crops and gardens, apply in early spring as soon as the soil can be worked. For perennial crops, apply at the end of dormancy. Mix thoroughly with the soil or growing media, taking care not to apply in concentrated form directly to the roots. To apply as a soil conditioner for fruit groves, ornamental trees, lawns and turf, apply directly as a top dressing.

The following application rates are approximate and may vary depending on climatic conditions, soil type and soil fertility.

FIELD CROPS:
200 - 400 lbs/Acre; 225 - 450 kg/Hectare

ROW CROPS:
2 lbs/100 ft; 1.5 kg/50 m

VEGETABLE & FLOWER GARDENS:
3 lbs/100 ft^2; 1.5 kg/10 m^2

TREES & ORCHARDS:
1 lb/in. of tree diameter; 200 g/cm of tree diameter

TURF GRASSES & LAWNS:
10 lbs/1000 ft^2; 5 kg/100 m^2

SEEDBEDS:
1 lb per 100 ft^2; 500 g/10 m^2

BEDDING PLANTS:
1 oz (2 tablespoons) per 200 $in.^2$ tray;
20-25 g/1000 cm^2 tray

POTTING MIXES:
2-3% of total volume of mix

FERTILIZER MIXES:
5-10% of total volume of mix

COMPOSTS:
10 lbs per yd^3 ; 6 kg/m^3

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Typical Analysis*

Organic Matter	66.0%
Ash (Minerals)	22.0%
Moisture	12.0%
	100.0%

Minerals

Total Nitrogen (N)	0.6-2.0%
Available Phosphoric Acid (P_2O_5)	0.3-0.9%
Soluble Potash (K_2O)	2.5-3.7%
Aluminum (Al)	20-100 ppm (mg/kg)
Arsenic (As)	<3 ppm (mg/kg)
Barium (Ba)	15-50 ppm (mg/kg)
Beryllium (Be)	<1 ppm (mg/kg)
Boron (B)	80-100 ppm (mg/kg)
Cadmium (Cd)	<1 ppm (mg/kg)
Calcium (Ca)	1.0-3.0%
Chlorine (Cl)	1.0-3.0%
Chromium (Cr)	<1 ppm (mg/kg)
Cobalt (Co)	1-10 ppm (mg/kg)
Copper (Cu)	4-15 ppm (mg/kg)
Iodine (I)	0.05-0.08%
Iron (Fe)	0.015-0.10%
Lead (Pb)	<1 ppm (mg/kg)
Magnesium (Mg)	0.5-1.0%
Manganese (Mn)	0-5 ppm (mg/kg)
Molybdenum (Mo)	<1 ppm (mg/kg)
Nickel (Ni)	1-5 ppm (mg/kg)
Selenium (Se)	3-4 ppm (mg/kg)
Sodium (Na)	2.4-4.0%
Strontium (Sr)	100-200 ppm (mg/kg)
Sulfur (S)	2.0-2.3%
Tin (Sn)	<10 ppm (mg/kg)
Titanium (Ti)	3-6 ppm (mg/kg)
Vanadium (V)	2-5 ppm (mg/kg)
Zinc (Zn)	35-100 ppm (mg/kg)

Carbohydrates

Alginic Acid	18.0-27.0%
Mannitol	3.0-8.0%
Laminarin	2.0-5.0%
Other Carbohydrates	20.0-22.0%

Amino Acid Content (Expressed as g of amino acid nitrogen per 100g of protein nitrogen)

Alanine	5.3
Arginine	8.0
Aspartic Acid	6.9
Cystine	trace
Glycine	5.0
Glutamic Acid	10.0
Histidine	1.3
Isoleucine	2.8
Leucine	4.6
Lysine	4.9
Methionine	0.7
Phenylalinine	2.3
Proline	2.6
Serine	3.0
Threonine	2.8
Tryptophan	trace
Tryosine	0.9
Valine	3.7

* *Acadian Seaplants Kelp Meal is produced from 100% pure Ascophyllum nodosum, hence its composition may vary due to natural variations in the live seaweed.*