



## Plant Health Care Inc.

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# Technical Bulletin

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## SEAWEED EXTRACT AND SEAWEED MEAL AS INGREDIENTS IN HORTICULTURAL PRODUCTS

### ***Introduction***

Commercial seaweed products are available, made from the kelp, *Ascophyllum nodosum*, which is typically harvested from the North Atlantic Ocean. These products are usually made from the whole body of the kelp, which is dried and further processed to produce a dried meal, a dry soluble extract, or a liquid solution. These products are natural, and many have been certified by organic agencies such as OMRI. Seaweed products have come into wide use among organic growers, and these products have made their way into accepted use in horticultural circles as well.

### ***Purported benefits***

Several benefits of seaweed products for plant growth have been unofficially reported. These benefits have often been attributed to nutritional value from the presence of various micronutrients in seaweed products, although some attribute the benefits to the presence of cytokinins (particularly kinetin) in seaweed. There is some debate regarding whether the horticultural beneficial effects of seaweed products can actually be attributed to their cytokinin content. Many contend that the mineral content of seaweed products is the sole reason for their beneficial attributes.

### ***Levels of Cytokinins in Seaweed Products***

Almost any product or extract made from a whole plant is likely to contain trace amounts of all substances that the plant produces, from sugars and vitamins, to phytohormones. Therefore, it is no surprise that seaweed products have been shown to contain *some* cytokinins. Cytokinin levels in seaweed typically range in the vicinity of 150 to 400 ppm for liquid products, and dry soluble extracts typically contain about 1.25 mg cytokinin per gram of powder (1.25 mg/g). (This is equivalent to a mere 0.125% by weight in the concentrated product.) The amounts of cytokinins present in seaweed meal, a dried, insoluble seaweed product, are negligible and unavailable. The amounts of cytokinins present in seaweed vary from batch to batch. This is typical for natural organic products. It is nearly impossible to standardize the contents of a plant harvested from its natural setting, without extensive processing.

### ***Other Uses of Seaweed Products***

Without confidence in the availability of consistent or even effective concentrations of cytokinins, are seaweed products useful in the horticultural setting? Yes. Without cytokinin, seaweed products are still a good amendment for increasing the organic content of soil, as well as a potential source of mineral nutrients, including potassium and trace minerals. In fact, seaweed products are completely biodegradable and provide an excellent nutrient source for rhizosphere bacteria. As an organic nutrient, seaweed products provide the needed carbon source and minerals for introduced bacteria to multiply and become established in the root zone. Any soluble mineral nutrients that are

not consumed by the bacteria are available to plants as well. This value of seaweed products justifies their use in bacterial inoculant products, despite a lack of cytokinin. However, when formulating seaweed-containing products as a nutrient source for introduced microbes (or in any formulation too low to deliver effective concentrations of phytohormones) it is important to avoid any confusion that would lead the consumer to expect cytokinin effects.

### ***Seaweed in Plant Health Care, Inc. Products***

Plant Health Care, Inc. uses seaweed meal in many granular products, and seaweed extract in several soluble products that contain beneficial rhizosphere bacteria. These ingredients, together with other nutritional organics (yucca, and vitamins from yeast extract) are used to provide adequate nutrition to promote the establishment of the introduced rhizosphere bacteria in the root zone. The products are NOT formulated to provide cytokinins in any reasonable concentrations that would have a significant growth promoting effect. If some cytokinins are naturally present as a result of the plant extracts added, they are likely present in only trace amounts, and would be diluted further with standard use of the product. Therefore, no claims are made regarding cytokinin-related growth benefits. All product benefits relate to improved plant nutrition, improved absorption of water, or increased soil fertility. These are accomplished by either: (1) the addition of fertilizer nutrients; (2) the natural symbiotic or commensal activities of the mycorrhizal fungi and beneficial bacteria. Seaweed ingredients are selected and formulated to contribute to microbial establishment. PHC products using seaweed are not formulated to produce hormonal effects.

### ***Plant Health Care Inc.'s Position Regarding Cytokinin***

Plant Health Care, Inc. does not sell cytokinins or other growth hormones. We do recognize the usefulness of phytohormones, including cytokinins, in horticulture, provided they are used carefully and intelligently. But phytohormones can be detrimental if overused, leading to bizarre and unnatural growth forms. Therefore, phytohormones are not recommended for general, unrestricted application, and Plant Health Care, Inc. does not formulate its products to deliver phytohormones. If a customer is interested in obtaining cytokinins, then he should purchase cytokinins directly from a reputable source.