

The Effect of Seaweed Concentrate and Fertilizer on the Growth of *Beta vulgaris*

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Summary

The effect of foliar applications of a commercially available seaweed concentrate (Kelpak 66) on the growth of swiss chard plants (*Beta vulgaris* L.) was investigated. Kelpak 66 at a dilution of 1:500 improved the growth of swiss chard significantly irrespective of whether it was applied on its own as a foliar spray or together with soil applications of a chemical fertilizer. The levels of cytokinin-like activity in the plants was found to be inversely related to growth. Plants treated with seaweed concentrate and liquid fertilizer had the lowest cytokinin activity in both the roots and the leaves, however, these plants grew significantly better than the controls or those which were sprayed with seaweed concentrate only. The significance of the findings is discussed.

Key words: *Ecklonia maxima*, seaweed concentrate, chemical fertilizer, cytokinins.

Introduction

Foliar spraying of field crops with growth regulators synthetic or natural, is common practice in agriculture. It has been demonstrated (Ries et al., 1978; Eriksen et al., 1982) that the application of both natural and synthetic growth regulators as a foliar spray increased the yield of several field crops over that of the controls.

Beneficial results from the use of seaweed extracts as natural regulators have included increased crop yields (Blunden and Wildgoose, 1977; Blunden et al., 1979; Featonby-Smith and Van Staden, 1983) and the delay of fruit senescence (Povolny, 1969). The reasons why seaweed extracts are beneficial to plant growth are still unclear, however, it is highly likely that plant hormones and in particular cytokinins are involved (Booth, 1966). The presence of cytokinins in marine algae (Hussain and Boney, 1969; Jennings, 1969) and in extracts prepared from marine algae (Brain et al., 1973; Featonby-Smith and Van Staden, 1983) is well documented. It has been demonstrated (Blunden and Wildgoose, 1977) that foliar applications of an aqueous seaweed extract of known cytokinin activity produced a significant increase in the yield of potatoes. Close correlations were also found to exist between the results obtained from the use of a synthetic cytokinin, kinetin and a seaweed extract of equivalent cytokinin activity. Cytokinins have been shown to retard senescence and maintain protein synthesis (Fletcher, 1969; Naito et al., 1978). Naito et al. (1978) found that RNA, protein and chlorophyll contents, dry weight, fresh weight and leaf area