The effect of seaweed concentrate on seedling transplants

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Seaweed concentrate applied either as a root drench or a foliar spray at transplanting significantly improved seedling growth of both cabbage and marigold. Both root and shoot growth were stimulated. In the case of marigolds, flowering was greatly accelerated.

Seewier-konsentraat aangewend of as 'n grond-benatting of blaar-bespuiting met verplanting het die groei van kool- en afrikaner-saailinge betekenisvol gestimuleer. Wortel- sowel as loofgroei is bevorder. In die geval van die afrikaner-saailinge is blomvorming baie bevorder.

Keywords: Cabbage, marigold, seaweed concentrate, transplants

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Introduction

Increased use is being made of seaweed products to manipulate plant growth (Blunden & Wildgoose 1977; Abetz 1980). Recent reports have shown that low levels of seaweed concentrate, prepared from *Ecklonia maxima*, improved root growth of certain crop plants (Featonby-Smith & Van Staden 1983a, b, 1984b; Nelson & Van Staden 1984). This effect was achieved irrespective of whether the seaweed was applied as a foliar spray or root drench. Application of the seaweed concentrate to *in vitro*-cultured tomato roots also stimulated their growth (Finnie & Van Staden 1985). This effect could be simulated by application of low levels of cytokinins which increased both root extension and lateral root development. The stimulatory effect of seaweed concentrate has been attributed to the presence of endogenous cytokinins (Featonby-Smith & Van Staden 1983a, 1984b) which have been tentatively identified in the product manufactured from *Ecklonia maxima* (Featonby-Smith & Van Staden 1984a). The fact that this effect is lost if the seaweed concentrate is ashed at 550°C indicates that the promotive effect could be due largely to the presence of organic molecules (Finnie & Van Staden 1985). The beneficial effect of seaweed concentrate on root development during the early stages of vegetative growth (Nelson & Van Staden 1984) holds considerable potential if it could reduce transplant shock of vegetables and ornamentals. This aspect was investigated using cabbage and marigold transplants as experimental material.

Materials and Methods

Seedlings of both cabbage (*Brassica oleracea* var *capitata*) and dwarf marigold (*Tagetes patula* var. *Janie*) were grown in styrofoam seedling trays to the 4-leaf stage.

In the first experiment, uniform seedlings of cabbage (40 per treatment) were selected, treated with seaweed concentrate (commercially available as Kelpak 66 and prepared from *Ecklonia maxima*) and then immediately transplanted into 12,5 cm pots containing a medium of sand : loam : peat (1:2:1). Root balls were submerged for 5 min in (a) distilled water (control); (b) a 1:500 seaweed concentrate dilution; and (c) a 1:250 seaweed concentrate dilution. Foliar sprays were not included as previous experiments have indicated that such treatment was not beneficial to cabbage seedlings, probably as a result of the waxy texture of the leaves (Kotze & Joubert 1980). After treatment and transplanting, the cabbage seedlings

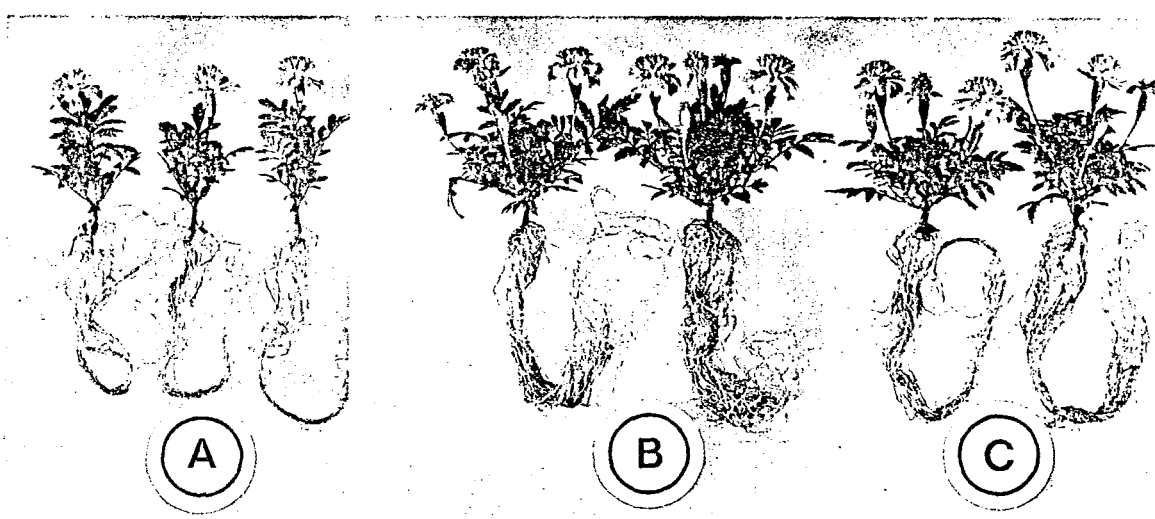

Figure 1 Marigolds 6 weeks after applying seaweed concentrate at transplanting. A = control; B = 1 cm^3 seaweed concentrate applied to the soil; C = 2 cm^3 seaweed concentrate applied as a foliar spray.