

## Effect of seaweed concentrate from *Ecklonia maxima* (Osbeck) Papenfuss on *Meloidogyne incognita* infestation on tomato

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### Abstract

Seaweed concentrate (SWC), prepared from *Ecklonia maxima*, when applied as a soil drench to tomato seedlings, significantly increased plant growth and reduced infestation by *Meloidogyne incognita*. Foliar applied SWC had little effect on plant growth and increased nematode galling. Ashing SWC reduced the suppressive effect on nematode infestation. In an *in vitro* experiment, SWC lessened infestation of root-knot nematodes on excised roots of a susceptible cultivar of tomato. Application of the same concentrations of SWC to a nematode-resistant cultivar increased the number of egg masses.

**Abbreviations:** SWC = seaweed concentrate; NAA = naphthaleneacetic acid

### Introduction

Root-knot nematodes (*Meloidogyne spp.*) are major crop pests in sub-tropical and tropical countries. Economic losses caused by these nematodes exceed 12% for all commercial crops in these regions (de Leij *et al.*, 1991). As some synthetic nematicides may harm the environment, natural products such as seaweed concentrates (SWCs) are being examined as an alternative means of controlling these pests.

The beneficial effects of seaweed products on the growth and yield of plants are well documented (Metting *et al.*, 1990). Improved insect and pathogen control (Stephenson, 1966; Booth, 1964; Povolny, 1971; Darrah & Hall, 1976) and a reduction in nematode infestation (Darrah & Hall, 1976; Tarjan, 1977; Tarjan & Frederick,

1983) have also been noted as a result of seaweed application. While enhanced plant growth is thought to be attributed to plant growth regulators, in particular cytokinins (Tay *et al.*, 1985; 1987), auxins (Crouch *et al.*, 1992) and ACC (ethylene precursor) (Nelson & Van Staden, 1985) in the extracts, it is not known how these products influence resistance to pest attack.

Featonby-Smith & Van Staden (1983) treated nematode-infested tomato plants with a seaweed concentrate and found a reduction in root-knot nematode galling and increased root growth. Recent work by De Waele *et al.* (1988) demonstrated that a SWC decreased reproduction of *Pratylenchus zae* on excised maize roots by 47-63% in an *in vitro* experiment. In a pot experiment however, reproduction of *P. zae* was not affected by the seaweed preparation. In the present study, the