IMPACT OF ASCOPHYLLUM NODOSUM EXTRACT ON DISEASES OF CARROT AND CUCUMBER

J. Jayaraj 1, Z.K. Punja and J. Norrie 2*

1 Department of Life Sciences, The University of the West Indies, St. Augustine, Trinidad and Tobago. 2 Acadian Seaplants Ltd., Dartmouth, Nova Scotia, Canada.

Application of seaweed extracts has been shown to induce systemic resistance in plants. Effects of Ascophyllum nodosum (Stimplex) were examined on disease in carrots and cucumbers. A 0.2% Stimplex spray applied three times to carrots reduced the incidence of Alternaria radicina and Botrytis cinerea more so than salicylic acid. The activity of the defense-related enzymes peroxidase, polyphenoloxidase, phenylalanine ammonia lyase, chitinase and β-1, 3-glucanase, were significantly higher in treated plants. Treated plants also had higher transcript levels of the pathogenesis-related protein 1 and 5 (PR-1 and PR-5), lipid transfer protein and several other pathogenesis-related proteins. Cucumber plants treated with 0.5 or 1.0% solution twice at 10-day intervals, with and without alternating chlorothalonil treatments showed reduced incidence of Alternaria and Fusarium, and an increase in protective enzyme activity. Results suggest that Stimplex™ can enhance disease resistance in carrots and cucumbers via the induction of defense-related genes or activation of signal molecules and elevated levels of phenolics.