CHAPTER 1

INFLUENCE OF HUMIC SUBSTANCES ON GROWTH AND PHYSIOLOGICAL PROCESSES

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1. INTRODUCTION

It is now generally accepted that soil organic matter (humus) plays a major role in maintaining or improving soil fertility\(^2,104\). Because of the complexity of soil organic matter, the precise nature of that role has been the subject of a considerable and long lasting debate. The present, and all too often inadequate, approaches to elucidating the mode of action of soil organic matter on plant growth are still partially influenced by historical concepts. An appraisal of the current ideas can only be undertaken by reference, albeit briefly, to the past. More detailed historical accounts are to be found elsewhere\(^2,104,171,225\).

1.1 Historical perspectives

For over 8000 years man has realized that dark soils are usually productive and that colour and productivity are commonly associated with the organic material derived chiefly from decaying plant remains\(^2\). Aristotle is often reported as being the first to suggest that plants absorb their food in an elaborated form from soils by processes similar to those found in animals\(^197,225\). The observation that calcined plants yield ash containing inorganic salts which have a beneficial effect on plant growth has also been known since antiquity. In 1563, Palissy\(^197\) recorded that when a plant is burned, it is reduced to an ash called alcaly which, when added to the soil, returns those substances which have been taken away by plants during growth.

During the early seventeenth century, Francis Bacon\(^6\) suggested that water formed the main nourishment of plants and soil was necessary only to keep them upright and to protect them from excessive changes in temperature. He also believed that plants absorbed a particular juice from the soil for their sustenance. Van Helmont too regarded water as