

Individuality of roots

Yoav Waisel and Amram Eshel

Dept of plant sciences, Tel Aviv University, Tel Aviv, Israel.

Abstract.

A root system develops in a dynamic three dimensional soil volume and therefore has to cope with environmental unevenness and unpredictability. This is achieved, in part, by the formation of various types of roots that express different traits. Such, differences in traits of various roots, are based on inherent characteristics of the plant. In spite of that, most physiological investigations continue to use root assemblages in their studies, without distinction between root types and without determination of the fraction that each root type may comprise.

Different functions of roots are activated, by the specific conditions that prevail in their immediate environment and the specific responses of the roots to such conditions. Differences in responses are manifested in the structure of the roots, in their growth pattern, in their composition and hormone content, in the activity of some of their key enzymes, in their capability for water and nutrient acquisition, in their tolerance to environmental stresses and in their effect on their rhizosphere.

Are the traits of each root type permanent characteristics or transient and may change in time? Is it possible to forecast the development of different types under different conditions? Those and other questions will be discussed.

The take home message is: A root system is comprised of various root types that function in concert, but still preserve their individuality.

Key words: Root types, Individual behavior