

Influence of climate change on management of Bulgarian agricultural cropping systems

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Abstract

Bulgaria is a part of EU market. Main agriculture crops in Bulgaria are wheat, corn, sunflower and vegetables and therefore this research focuses on intensive agricultural production. Horticulture is situated at the interface between agroecosystem and society. Therefore it is very important to establish the relationship between change of climate conditions, management of agricultural cropping systems and soil quality with special emphasis on soil biota. Soil food web includes plants and other organisms that occupy different positions in the food chain, which are linked by multiple ecological networks. A review of the literature showed that changes in climate conditions will impact the soil multitrophic interactions and processes controlling these interactions.

The main aim of this review is to analyze current level and different aspects of agricultural production and to put this into the context of global climate change.

The average monthly temperatures, absolute maximum and absolute minimum air temperature, precipitation patterns and relative humidity at the beginning of this century for the arable land in region of Plovdiv were examined. A rising trend in the average monthly temperature in summer and fall of absolute minimum air temperatures during the winter months was determined when compared with climatic conditions of the 20th century. We determined an increase in annual rainfall amount and dynamic change in its distribution through seasons and within different years (e.g., in 2014 there is an increase of 400 mm to the annual amount of rainfall).

Soil-borne pathogens are responsible for about 50 % of diseases that affect major crops in Bulgaria and together with plant-parasitic nematodes cause enormous loss in agriculture every year. In this review, we focus on soil biota diversity and function influenced by combination of climatic factors and cropping systems. Based on current knowledge about new trends of challenges in sustainable agricultural production, mitigating climate strategies could be promoted.

Key words: climate, managing cropping systems, soil biota, agroecosystem

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