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Solar Calculations of Modified Arch (Semi-Spherical) Type Greenhouse System for Bayburt City

Authors : Uğur Çakir, Erol Şahin, Kemal Çomakli, Ayşegül Çokgez Kuş

Abstract : Solar energy is thought as main source of all energy sources on the world and it can be used in many applications like agricultural areas, heating cooling or direct electricity production directly or indirectly. Greenhousing is the first one of the agricultural activities that solar energy can be used directly in. Greenhouses offer us suitable conditions which can be controlled easily for the growth of the plant and they are made by using a covering material that allows the sun light entering into the system. Covering material can be glass, fiber glass, plastic or another transparent element. This study investigates the solar energy usability rates and solar energy benefiting rates of a semi-spherical (modified arch) type greenhouse system according to different orientations and positions which exists under climatic conditions of Bayburt. In the concept of this study it is tried to determine the best direction and best sizes of a semi-spherical greenhouse to get best solar benefit from the sun. To achieve this aim a modeling study is made by using MATLAB. However this modeling study is running for some determined shapes and greenhouses it can be used for different shaped greenhouses or buildings. The basic parameters are determined as greenhouse azimuth angle, the rate of size of long edge to short and seasonal solar energy gaining of greenhouse.

Keywords : greenhousing, solar energy, direct radiation, renewable energy
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