



Investigation of abiotic windbreak porosity patterns on change of air flow

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Abstract

Due to the drought in recent years and the need to increase the efficient use of water in agriculture, the abiotic windbreak appears to be more suitable than biotic. In order to investigate the effects of lattice brick patterns in protection of the windbreak on the back, an experimental study was carried out in a wind tunnel. For this purpose, five lattice brick patterns with different densities, with density of 100% for the control in a randomized complete block design with four replications were studied. The results revealed that with increasing porosity in the windbreaks, while reducing wind speed and keeping the area protected; flow lines become parallel and vortex currents are not observed. While with reduced porosity, the wind streamlines the flow and becomes turbulent and reduces protection in the desired area. Also, results showed that the construction of windbreaks with a height less than the height of the protection structures (like a greenhouse), especially in high-density windbreaks, not only protect against winds not retained, but also with the formation of more rapid and vortex flows behind the windbreaks, the damage increases. Thus, attention to create optimum density with the use of appropriate lattice patterns is important in establishing abiotic brick windbreaks.

Keywords: Wind erosion, Density of windbreak, Brick, Wind tunnel, Combat to desertification.

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