



# **EFFECT OF POLY-GREENHOUSES WITH DIFFERENT SHADING RATIOS ON SEEDLINGS GERMINATION, GROWTH RATE AND YIELD OF CUCUMBER UNDER FAYOUM CLIMATIC CONDITIONS**

By

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## **ABSTRACT**

Eight similar experimental poly-greenhouse models with different shading rations and ventilation gaps were designed, constructed and installed at the Faculty of Agriculture Farm in Demo, which is located at 5 Km of Fayoum city, Egypt (latitude of  $29.18^{\circ}$  N and longitude angle  $30.3^{\circ}$ ). These poly-greenhouse models were used to represent four treatments for summer and winter seasons with two replicates for each treatment. Every two replicates (one treatment) were covered only with one of these black screen shade net sheets of 25%, 50%, 63% and 75% shading ratios during the summer months. While, one treatment (two replicates) was fully covered by a single layer of polyethylene (without shading), and the others three treatments were fully covered by polyethylene with an external black screen shade net sheets of 25%, 63% and 75% shading ratios during the winter months. The thermal performance of the poly-greenhouse models and their effects on seedlings germination, growth rate and yield of cucumber plants were investigated under Fayoum depression climatic conditions during the summer and winter months (2014, 2015).

The obtained results indicated that as the poly-greenhouse shading ratio increases, the solar radiation incident inside it decreases. The air temperatures inside all the poly-greenhouse models were below the ambient temperature curve during the period of the day-time (from 8:00 am to 8:00 pm) during the summer months (May to July) with ventilation rate during the night-time. In contrast, the air temperatures inside the un-shaded poly-greenhouse model was almost higher than in shaded models and the ambient temperature during the period of the day-time

(from 8:00 am to 6:00 pm) during the winter months (December to February). All shading ratios caused to increase the relative humidity inside the poly-greenhouse models, especially with 63% and 75% shading ratios. So, the cucumber plants didn't suffer during growth period. As shading ratio increased the light intensity decreased, and thus, the light intensity was adequate when it decreased by 50%, 63% and 75% shading ratios, which is satisfactory for seedlings germination, seedling growth and high values of chemical characteristics of the cucumber seedlings during the summer months. While, the shading ratios of 50% and 63% gave the higher plant growth, chemical characteristics of plants and yield of cucumber than those with the other shading ratios (25% and 75%) during the summer months (May to July). For the winter months the light intensity inside the poly-greenhouse was adequate when it decreased by covering the models with external black screen sheets of 25%, 63% and 75% shading ratios, which is satisfactory for seedlings germination, seedling growth and chemical characteristics of seedlings. But the un-shaded poly-greenhouse model and the poly-greenhouse model covered by polyethylene with external black screen sheets of 25% shading ratio was suitable for better plant growth, better chemical characteristics of plants and higher yield of cucumber than those with the others treatments (external shading ratios of 63% and 75%).