Efficiency Of Plastic Nets For Greenhouse Shading

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**Abstract.** Agricultural production is influenced by extreme weather phenomena, accompanied by major global changes, such as the increasingly sudden and frequent appearance of new types of insects, the transformation of eating habits (e.g., "smart/super foods"), etc. Thus, the concept of crop protection under greenhouse, understood as a mere passive defense (from hail, sun, insects, wind, birds, etc.), is gradually being overcome: no longer a shelter "against" or "in defense", but rather an intelligent structure "for" or "proactive". Coating materials used to cover a greenhouse for the purpose of crop protection can play a crucial role on the quality of light hitting crops, controlling radiation in different ways, especially in the PAR wavebands (400-700 nm). Different covering materials can affect crop performance through selective filtering, which modifies incoming radiation, as well as plant physiology, entomological and metabolomic aspects. Covering materials and shading strategies can be proactively selected and implemented in many mild climate areas, as well as in warm regions where spring/summer solar radiation levels are often too high for proper greenhouse management. To study the shading effect of nets, the radiometric characteristics of several plastic nets were determined by laboratory tests. In addition, some field tests were coordinated with the aim of comparing the material. In these field tests, few different small-scale tunnels were covered with plastic film and protected with an external plastic net (PRISMA HDF®), fixed at different distance from the plastic film for each tunnel. Experimental activities allow comparison of the values measured inside the two tunnels with each other. Air temperature, relative humidity, soil temperature covered with a layer of black mulching fabric, solar radiation were measured. The results confirmed that plastic nets play a considerable role in selective filtering of solar radiation, as well as in improving the thermal efficiency of the greenhouse and its overall thermodynamic behaviour.