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nets was later carried out to analyse the effect of varying the mesh size on inside greenhouse climate. It was shown that with an unchanged vent opening aperture the use of anti-Thrips net was most of the time incompatible with the maintenance of a satisfactory climate for plant growth in the weather conditions in the coastal areas of southern Morocco.

S03.294

Evaluation of Optical and Mechanical Properties of Different Plastic Greenhouse Covers

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Plastics are the main protagonists of the new agricultural scene. They are used as covers for greenhouses and small tunnel films for mulching, shading, bags for hydroponics, drip irrigation pipes, etc. waterproofing sheets. The formulation covers that modify variables has been one of the challenges in the development of greenhouse coverings, the design should help harness the incident energy and maintain the mechanical properties of the covers. This work was developed in the experimental field of the Research Center in Applied Chemistry (CIQA) in Saltillo Coah. Installing microtunnels with 22 plastic covers, all vary in their chemical composition. Sensors and ancillary equipment used to monitor internal and external temperatures. As results we conclude that covers highlights in different variables IC 3 highlighted in puncture resistance, cover IC 10 as the best in the passage of Diffuse Radiation, IC 11 the best in terms of blocking passage of UV Radiation, IC 8 and the cover that lets higher percentage of PAR radiation, IC 12 is Excel to raise the temperature, while the decks IC 15 and IC 16 are best LIR amount of radiation allowed to pass during the day. With regard to NIR radiation blocking any of the 22 covered is refreshing to not block the radiation below 70%.

S03.295

The Effect of Shading Net Position on Greenhouse Microclimate

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A major problem confronting the Mediterranean greenhouse horticulture is the excess of heat during the summer. One of the methods to alleviate the heat load is shading with nets. Shading nets can either be fixed or mobile. They can be external (above the greenhouse) or internal (inside the greenhouse). Experiments were carried out in a greenhouse in which a tomato crop was grown. The greenhouse was divided into two compartments of three spans each. In one compartment a 30% shading net was applied above the greenhouse, on top of the polyethylene cover, while in the other compartment it was stretched inside the compartment, at gutter height and parallel to the soil. Solar radiation outside and inside the greenhouse and light intensity above the crop and at soil level were measured continuously in several days, in each compartment, in addition to measurements of air and leaf temperatures and air humidity. The results show that net position does not significantly affect the values of most measured parameters. It appears that the temperature difference between the air and the leaves is the parameter that is most affected by the net position.

S03.296

Thermal Behaviour of a Greenhouse Soil in a Mild Winter Area

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In coastal areas with mild-winter climates, such as Almería, greenhouses with low-cost structures, covered with plastic films, without climate control systems and with soils covered with superficial mulch layers of sand and fine gravel particles (enarenado soil) predominate. These mulch layers are widely used to improve thermal and soil salinity conditions and water use efficiency. This work analyses the thermal behaviour of this soil type, compared with one without mulch, in order to optimise daily energy exchanging function. Measurements were carried out in an uncultivated, three-span multi-tunnel greenhouse with an artificial layered soil, which is typical in this region. Temperatures just below the surface (0.01 m depth) of the mulch layer (M) were much higher than at the surface of soil without mulch layer (S) during day-time, whereas nocturnal values were higher in S than in M, with differences of up to 3 ºC. Average temperature over 0.05 and 0.1 m depth was higher in M than in S for the day-time period with maximum differences of 1 ºC, whereas nocturnal values were similar. Throughout a 14 day-period, temperature in the layer where most roots usually grow (at 0.15 m depth for S and at 0.2 m depth for M) increased in M and decreased in S, reaching differences of up to 7 ºC. Greenhouse air temperature was clearly higher for all air layers in M compared to S with maximum differences of around 5 ºC for the day-time period. Nocturnal air temperatures were similar or slightly lower in M.

S03.297

Efficient Cooling of Strawberries: From Model Calculation to Implementation in a Commercial Greenhouse

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Growing of strawberry in autumn and spring crop cycle in greenhouses requires an on-time start in August. Light intensity in this period ensures good quality of crop with enough flower capacity for the spring crop cycle. A disadvantage of this early start is the almost non controllability of the start of harvest in autumn. An early start of harvest results in low prices and a low production. To control this, cooling of the greenhouse is required. Using a greenhouse climate models the effects on greenhouse climate of a number of cooling methods as mechanical cooling, misting, misting with forced ventilation and insulation of the greenhouse soil were calculated. The most promising solutions are implemented in a greenhouse with 4 compartments of a commercial grower. One compartment is used as reference, equipped with a misting system and vertical fans to improve air movement around the crop. According the model prediction, the most promising solution for the cooling of the greenhouse is mechanical cooling in combination with insulation of the soil. This has the disadvantage of a higher heating requirement during winter, as calculated by the model. Preliminary results of the autumn crop show good agreement of the model calculations with the measured data. A reduction in grow degrees hours of more then 10% by beginning of November was achieved. Night time temperature dropped up to 4 ºC compared with the reference. Start of harvest was delayed by 10 days with higher average fruit weight, higher and more valuable production. The heat requirement was higher as reference as calculated. In this work we present model calculations and first results of an experiment with 4 cooling systems, analyse the effect on plant processes such as photosynthesis, transpiration and crop morphology, as well as the effects on greenhouse temperature, carbon dioxide management and humidity.

S03.298

Application of Reflective Screen/Board to Improving Light Environment in Chinese Lean-to Greenhouses

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In the last two decades, the lean-to greenhouses have been playing an important role in off-season production of vegetables in north China to meet the increased

demand of vegetal
during winter, espe
limited the growth
inside a lean-to gre
to improve light en
reflective screen/bo
ture of made-up m
on greenhouse croj
was suggested in th

S03.299

Cucumber
Roof Geom

Hernández-B
Castilla, N.[2]

[1]UNIVERSIDAD DE ALMERÍA
[2]IPAPA- APARTADO 2027- 1

A study comparing
different roof geom
two campaigns, with
The first greenhou
("parral" type), whi
(of three spans) wer
roof ventilation. Th
similar in both gree
chouse. However, n
cucumber yields an
leaf area - SLA-, croj
growth rate - RGR-)
the northern and so
higher in the southe
radiation levels alon
plants grown at low
ducing the assimilat
cumulated solar radi
was quantified.

S03.300

Effects of a T
and Develop
Tomato Plan

Dieleman, J. A
WAGENINGEN UR GREENHOUS

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the effects of a tempe
bearing tomato plants
plants are most sensiti
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of the beginning of th
light period resulted in
weight. Lowering the
elongation or plant we
by the temporarily red
fruit bearing tomato cr
of the first truss, temp
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months) of a fruit bea
affect leaf length, inte
In practice, these resul