

Greenhouse insurance

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«...greenhouse production is generating growing volumes of produce and sales. This sector has a sufficiently high technical and professional level for it to demand products which allow it to manage its risks. The insurance sector's aim is to satisfy this demand and at the same time achieve balanced results.»

Greenhouses first came about at the beginnings of the 20th century in the search for alternatives to the severe climatic conditions of northern Europe in order to produce vegetables in the open air.

It is estimated that there are currently more than 485,000 hectares of greenhouses worldwide, with a growth of greater than 20% annually in the last 20 years; these are used to produce all types of flowers, vegetables and vegetable primary materials (seedlings).

Spain has shown great growth in production under greenhouse

Greenhouse evolution

Year	Hectares
1967	342
1978	8,305
1988	26,564
1998	50,315

Official Ministry of Agriculture figures

conditions in the last few years. Although they are present in all regions, the greatest part of this surface area is concentrated along the Mediterranean coast.

From the first greenhouses which were constructed in Spain at the end of the Sixties with a wooden structure up to the present-day designs, the development of the structures of greenhouses has been closely linked to the increase in exports of vegetables and ornamental plants, the increase in production yield and product quality, together with the need to have installations permitting much more accurate climatic control (temperature, ventilation, relative humidity, luminosity, CO₂ content...).

There follow a few figures concerning the importance of agricultural production in Almeria, in this province in the South East of Spain at present more than 27,000 hectares of greenhouses are in use, and more than 1,500,000 tonnes of vegetables are exported with a value of more than EUR 1.2 billion. At the same time EUR 102 million of plastics, EUR 96 million of seeds and EUR 79 million of irrigation systems are consumed.

CONSTRUCTION DESIGN OF THE GREENHOUSE. CONTENTS.

The design of the greenhouse structure should take into account all possible combinations of actions or loads which may take place during the useful life of the greenhouse. These actions or loads are the following:

- Permanent loads: these are those which are due to the weight of the structural and non-structural elements of the greenhouse itself.
- Permanent installation loads: those arising from permanently installed equipment (heating, lighting, shading, irrigation, ventilation and insulation).
- Wind loads: these reflect the effect of the wind on the structure.
- Snow loads: due to snow on the structure.
- Crop loads: these must be taken into account when the plants and crops are supported by the greenhouse structure itself.
- Vertically concentrated loads: these are produced by human actions during repair and maintenance operations.
- Temporary installation loads: produced by mobile equipment such as cleaning machines, etc.
- Seismic loads.
- Thermal loads: due to the effects of temperature.

All this design process is included in the recently passed «European Regulation on



Greenhouse Construction» (EN 13031-1) which will be enacted shortly. This will allow newly constructed greenhouses to be certified in the very near future - as has already been the case for some years in other countries.

With regard to the roofing material, due to its climate, Spain primarily uses plastic materials whilst glass is more used in countries in the north and centre of Europe. A key point in maintaining the structural integrity of the greenhouse is the attachment of this plastic material to the structure.

In addition to the structural part, the greenhouse provides an situation in which multiple factors are regulated - environmental, nutritional, waste products and quality etc. It is for this reason that many of these installations have heating and heat distribution elements, thermal screens which regulate luminosity, dynamic ventilation installations, carbon dioxide diffusers, automatic irrigation and fertilisation systems and hydroponic substrates as an alternative for the development of the root system. All this is controlled by modern computers which allow for continual monitoring and practically instantaneous notification of any incidents.

Lastly, the final aim is the production of plants and/or flowers for local, regional or international markets which are becoming increasingly demanding with respect to quality. The crop is subject to both the environmental conditions of the medium in which it is produced and to possible mechanical, physical and chemical interactions.

**INSURANCE AS
AN INSTRUMENT FOR
RISK MANAGEMENT**

An average greenhouse may have a surface area of 5,000 m²

and, if it is equipped with climatic control, will suppose an investment of EUR 24 -30 /m², which equates to an average investment of EUR 125,000. It is therefore becoming increasingly common for its owner to take out an insurance policy to cover the various risks which may affect him.

Due to the nature of its location and materials it is a construction which is certainly exposed to various climatic events. Despite being designed to withstand a certain wind load depending on its geographical location, in extreme storm or tornado conditions both the covering material and the structure itself may suffer considerable damage. This is why this is the first cover which is requested.

Other climatic damage which may occur arise from hail, rain, snow and flooding. More infrequently damage may arise from fire and acts of vandalism.

The increasing technical sophistication of these installations is bringing about requests for «new generation» covers. These covers include, in addition to cover against electrical or electronic damage to control equipment which has historically been provided, cover against damage to crops brought about by failures in the irrigation programmers (changing the pH conditions, electrical conductivity or dosage of the various nutrients which are added automatically to the water), or by malfunctions in the automatic climate controls. These policies also frequently include cover against loss of profits.

Greenhouse insurance is however relatively new in Spain. Until the only a few years ago these structures were designed without the technical criteria or load calculations mentioned above, insurers were therefore reluctant to accept

these risks whose loss history was far from adequate.

In any case, a greenhouse portfolio requires continual and exhaustive monitoring of underwriting and loss experience in order to control exposures in different areas and any possible catastrophic accumulation of losses. This monitoring allows:

- An attempt to be made to set the most suitable control areas with respect to the effects or of a catastrophic event.
- The setting of rates, and, when necessary, their correction will respect to the behaviour of the greenhouses with regard to climatic risks and, more specifically, wind.
- The valuation of PML values at different levels (by loss, exposure, event or control area).
- A decision to be made with respect to the most suitable catastrophe reinsurance programme according to the portfolio profile and the various exposures.

After various years of underwriting and after reaching volumes of insured sums and premiums which may be considered sufficient, it can be seen that the greenhouses themselves and also the different geographical regions are characterised by exposure to wind. All this information is processed and conclusions are obtained which will allow insurance conditions to be improved.

In conclusion, greenhouse production is generating growing volumes of produce and sales. This sector has a sufficiently high technical and professional level for it to demand products which allow it to manage its risks. The insurance sector's aim is to satisfy this demand and at the same time achieve balanced results. ■